

2022–2023

ANNUAL PERFORMANCE PLAN



Kalahari sand with Hoodia Gordonii and Richtersveld volcanics in the background in the Northern Cape Province



**mineral resources
& energy**

Department:
Minerals Resources and Energy
REPUBLIC OF SOUTH AFRICA



Council for Geoscience

ANNUAL PERFORMANCE PLAN

COUNCIL FOR GEOSCIENCE

2022 -2023

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Cover Image: Kalahari sand with Hoodia Gordonii and Richtersveld volcanics in the background in the Northern Cape Province

Photo credit: Dr Valerie Nxumalo

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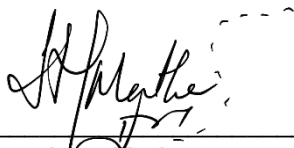
Acronyms

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
AMD	Acid Mine Drainage
APP	Annual Performance Plan
AU	African Union
BSC	Balanced Scorecard
CCUS	Carbon Capture Utilisation and Storage
CGS	Council for Geoscience
CIMERA	Centre of Excellence (CoE) for Integrated Mineral and Energy Resource Analysis
Covid-19	Coronavirus disease 2019
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organisation
DALRRD	Department of Agriculture, Land Reform and Rural Development
DFFE	Department of Forestry, Fisheries and Environment
DHET	Department of Higher Education and Training
DHS	Department of Human Settlements
DIRCO	Department of International Relations and Cooperation
DMRE	Department of Mineral Resources and Energy
DPME	Department of Planning, Monitoring and Evaluation
DPWI	Department of Public Works and Infrastructure
DSI	Department of Science and Innovation
DTIC	Department of Trade, Industry and Competition
DWS	Department of Water and Sanitation
ECSP	Electronic Communications Service Provider
EME	Exempted Micro Enterprise
ERRP	Economic Reconstruction and Recovery Plan
EXCO	Executive Committee
GDP	Gross Domestic Product
GTP	Geoscience Technical Programme
ICT	Information and Communications Technology
IMMP	Integrated and Multidisciplinary Geoscience Mapping Programme
IPP	Independent Power Producer
IRP	Integrated Resource Plan
IYPT	International Year of the Periodic Table of Chemical Elements
MPRDA	Mineral and Petroleum Resources Development Act
MTEF	Medium Term Expenditure Framework
MTSF	Medium Term Strategic Framework
NDP	National Development Plan
NGO	Non-Governmental Organisations
OAGS	Organisation of African Geological Surveys
OECD	Organisation for Economic Cooperation and Development
PFMA	Public Finance Management Act
PPPFA	Preferential Procurement Policy Framework Act
QSE	Qualifying Small Enterprise
REE	Rare Earth Elements
SA	South Africa
SADC	Southern African Development Community
SANDF	South African National Defence Force
SDG	Sustainable Development Goal
SP	Strategic Plan
UN	United Nations

Board Chairperson's Statement

The Council for Geoscience's (CGS's) Annual Performance Plan (APP) provides a roadmap for the implementation of the integrated and multidisciplinary geoscience mapping programme (IMMP) through the Geoscience Technical Programme (GTP) for the Medium Term Expenditure Framework (MTEF) period (2022/23 – 2024/25). The GTP has adopted an integrated and multidisciplinary approach to optimise delivery of the geoscience mandate.

The APP outlines the strategic objectives/programmes, which state the intended outcomes and outputs of the CGS for the MTEF period (2022/23 – 2024/25); the associated key risks and mitigation plans; financial and human resources allocations and the materiality framework, which indicates material threshold values for transactions and processes to be initiated if thresholds are exceeded. The APP further includes the output indicators and targets.



Dr Humphrey Mathe


Chairperson of the Board: Council for Geoscience

Chief Executive Officer's Statement

The CGS presents this plan to affirm the refocus of the functions of the organisation to its legislatively prescribed mandate. This refocus of the CGS strategy was primarily determined to provide a framework that seeks to optimise the delivery of the CGS programme (i.e. the integrated and multidisciplinary geoscience mapping programme at a scale of 1:50 000) which is sufficiently aligned with the intent of "science applications responding to current and future societal challenges" as well as national imperatives.

This document presents the APP of the CGS for the MTEF period 2022/23 – 2024/25, which operationalises the five-year Strategic Plan of the CGS. The APP of the CGS outlines the outputs and related deliverables for the MTEF period 2022/23 – 2024/25, which are aligned with the outcomes reflected in the CGS Strategic Plan 2020 – 2025. The APP further provides an indication of financial and human resources allocations, as well as the output indicators and targets.

We are delighted to present the APP of the CGS for FY2022/23 in support of accelerating the delivery of our mandate, as inscribed in the Geoscience Act, Act No. 100 of 1993 and the Geoscience Amendment Act, Act No. 16 of 2010. This APP is closely aligned to the CGS strategy integrating all critical aspects of the geosciences.



Mr Mosa Mabuza

Chief Executive Officer: Council for Geoscience

Official Sign-Off

It is hereby certified that this Annual Performance Plan:


- Was developed by the Management of the CGS under the guidance of the Board.
- Considers all the relevant policies, legislation and other mandates for which the CGS is responsible.
- Accurately reflects the outcomes and outputs which the CGS will endeavour to achieve over the financial period 2022/23.

Signature: _____

Ms Refilwe Monoko
Executive Manager: Geoscientific Services

Signature: _____

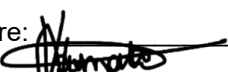
Dr David Khoza
Executive Manager: Integrated Geoscience Development

Signature: _____

Mr Tshapo Mokolobate
Acting Executive Manager: Corporate Services

Signature: _____

Mr Leonard Matsepe
Chief Financial Officer

Signature: _____

Dr Valerie Nxumalo
Manager: Strategic Management

Signature: _____

Mr Mosa Mabuza
Chief Executive Officer

Signature: _____

Dr Humphrey Mathe
Chairperson of the Board

Signature: _____

Mr Samson Gwede Mantashe
Executive Authority

PART A: OUR MANDATE

1. Updates to the relevant legislation and policy mandates

1.1 Constitutional Mandate

The **South African Constitution** is the Supreme Law that underpins the democratic dispensation within the Republic of South Africa.

The CGS is listed as a **Schedule 3A Public Entity** and is established in terms of the **Geoscience Act No. 100 of 1993, as amended**. This Act enunciates the Constitution in defining the mandate of the CGS. Accordingly, Chapter 10 of the South African Constitution titled Public Administration makes reference to basic values and principles governing public administration requiring that public administration be governed by the democratic values and principles enshrined in the Constitution, including the following principles:

- a) A high standard of professional ethics must be promoted and maintained.
- b) Efficient, economic and effective use of resources must be promoted.
- c) Public administration must be development-oriented.
- d) Services must be provided impartially, fairly, equitably and without bias.
- e) People's needs must be responded to, and the public must be encouraged to participate in policy-making.
- f) Public administration must be accountable.
- g) Transparency must be fostered by providing the public with timely, accessible and accurate information.
- h) Good human-resource management and career-development practices, to maximise human potential, must be cultivated.
- i) Public administration must be broadly representative of the South African people, with employment and personnel management practices based on ability, objectivity, fairness and the need to redress the imbalances of the past to achieve broad representation.

1.2 Legislative and policy mandates

Legislative Mandate: The Geoscience Act (Act No. 100 of 1993) and the subsequent Geoscience Amendment Act (Act No. 16 of 2010) establish the CGS, which is listed as a Schedule 3A Public Entity in terms of the Public Finance Management Act (PFMA) (Act No. 1 of 1999). The mandate of the CGS includes, albeit not limited to:

- I. The **systematic onshore and offshore** geoscientific mapping of South Africa.
- II. **Undertake geoscientific research** and related technological development.
- III. The **collection and curation** of all geoscience data and act as a national geoscience repository.
- IV. The **compilation and development of comprehensive and integrated geoscience knowledge** and information, such as geology, geophysics, geochemistry, engineering geology, economic geology, geochronology, palaeontology, geohydrological aquifer systems, geotechnical investigations, marine geology, geomagnetism, seismology, geohazards, environmental geology and other related disciplines.
- V. **Bring to the notice of the Minister any information in relation to the prospecting for and mining of mineral resources**, which is likely to be of use or benefit to the Republic.
- VI. Promote the search for and the exploitation of any minerals in the Republic.
- VII. Study (i) the **distribution and nature of mineral resources** and (ii) geoenvironmental aspects of past, current and future mineral exploitation.

- VIII. Study the use of the surface and the **subsurface of the land and the seabed**, and from a geoscientific viewpoint advise government institutions and the general public on the judicious and safe use thereof with a view to facilitate sustainable development.
- IX. Develop and maintain the **national geoscientific library**, the national geoscientific information centre, the **national borehole core depository**, the **national geophysical and geochemical test sites**, the **national geoscience museum**, the national seismological network and the national geoscience analytical facility.
- X. Conduct investigations and render prescribed specialised services to public and private institutions.
- XI. Undertake –
- a) research of its own accord;
 - b) research on **behalf of the State** or **any other government institution**, or on behalf of **any person or institution**, or support such research financially; or
 - c) **any reconnaissance operation, prospecting** and other related activities with a view to **attracting investment to the mineral resource sector**; and
 - d) do anything that is necessary for or conducive to the achievement of the said objects.
- XII. Render geoscience knowledge services and **advice to the State**.

In terms of the amendments made to the Geoscience Act, sections 4(c), 4(eA), 4(f), 5(b) and 8 that deal with, inter alia, the custodianship of geoscientific information, the review and evaluation of geotechnical reports, the maintenance of certain national geoscientific facilities and the appointment of a Geotechnical Appeal Committee were held in abeyance. Synchronously, the Mineral and Petroleum Resources Development Act (MPRDA) explicitly provides for the CGS to receive, validate and curate geological information from prospect rights and mining rights holders as part of their regulatory compliance requirement. These amendments constitute organic growth and significantly broaden the mandate of the CGS.

The Policy Mandate: The Minerals and Mining Policy for South Africa (1998) affirms the CGS as a science council that supports research and development underpinning the sustainable development of the mining industry. This further enunciates the Constitutional mandate, as elaborated in the founding prescripts of the CGS.

This APP is aligned to the CGS's Strategic Plan 2020 – 2025, which primarily gives effect to the Policy Mandate.

2. Updates to Institutional policies and strategies governing the five-year planning period

In addition to the legislative mandate, the CGS APP, which is aligned to the Strategic Plan 2020 -2025 also implements other national policies and frameworks including, but not limited to, the following:

2.1 National Development Plan (NDP) 2030

In realising the urgent need to address the national imperatives, the CGS ensures that its business model and all its activities address the following strategic national outcomes as per the NDP 2030.

- ***Decent employment through inclusive economic growth:*** Delivering spatial geoscience information and services that attract local and international investment to develop mineral and upstream petroleum resources.
- ***A skilled and capable workforce to support an inclusive growth path:*** Build capacity in respect of geoscientific, administrative and managerial/leadership skills while also developing innovative outputs, systems and services.

- **An efficient, competitive and responsive economic infrastructure network:** Geoscience information and services input to infrastructure development in support of South Africa's economic development of mineral and upstream petroleum resources.
- **Vibrant, equitable and sustainable rural communities with food security for all:** The provision of geoscientific information that enables agricultural development and groundwater exploration, amongst others.
- **Environmental assets and natural resources which are well protected and continually enhanced:** Conducting research regarding, inter alia, Acid Mine Drainage (AMD) and Carbon Capture and Storage (CCS) technologies and establishing environmental baselines for possible future shale gas development.
- **An efficient, effective and development-oriented public service and an empowered fair and inclusive citizenship:** Strengthening the CGS to optimise delivery of the mandate and effect the transformative programme of Government.

2.2 Government's Medium Term Strategic Framework (MTSF)

The MTSF reflects the Government-wide set of delivery commitments made in an administrative cycle of five years. This framework delineates strategic areas of focus for Government entities to dedicate resources and effort in order to plan, implement and fulfil the afore-mentioned commitments, all of which contribute to the overarching National Visions popularly known as the NDP. In this regard, the CGS develops its strategy as guided by the MTSF and supported by an Annual Performance Plan (APP) which incorporates relevant **actions, indicators and targets** that seek to incrementally support the national developmental imperatives. The strategy gives effect to six of the seven MTSF priorities, which include:

- A capable, ethical and developmental state
- Economic transformation and job creation
- Education, skills and health
- Spatial integration, human settlements and local government
- Social cohesion and safe communities
- A better Africa and World

The CGS's APP also addresses the **cross-cutting focus areas** of **women, youth and persons with disabilities**.

2.3 Government's Revised Medium Term Strategic Framework (MTSF) 2019-2024

The implementation of the MTSF 2019-2024 (see section 2.2 above) was largely disrupted by the outbreak of the COVID-19 pandemic and the declaration of a National State of Disaster on the 15 March 2020. This necessitated the Government to reprioritise its plans and budgets in response to the pandemic, which has had a devastating impact on the health, social and economic aspects of the lives of South Africans. The MTSF 2019-2024 was therefore revised to include critical interventions that are part of government relief and recovery efforts.

The Revised MTSF 2019-2024 continues to reflect government's plan of action over the remaining term of the sixth administration (FY2021/22 to 2023/24). The Revised MTSF 2019-2024 also prioritises government commitments to prevail over the coronavirus pandemic and to work towards recovery. These commitments were outlined in the 2021 State of the Nation Address and include the following focus areas:

1. To defeat the coronavirus pandemic
2. To accelerate South Africa's economic recovery [e.g. through the implementation of Economic Reconstruction and Recovery Plan (ERRP)]
3. To implement economic reforms to create sustainable jobs and drive inclusive growth; and

4. To fight corruption and strengthen the capacity of the State.

2.4 The South African Economic Reconstruction and Recovery Plan

The ERRP of 2020 aims to build a new economy and unleash South Africa's true potential. The overarching goal of the plan is to create sustainable, resilient and inclusive economy. The ERRP focuses on the following priority areas:

- Energy security.
- Industrial base to create jobs.
- Mass public employment programme.
- Infrastructure development.
- Macro-economic interventions.
- Green economy.
- Food security.
- Reviving the tourism sector.

The CGS APP is developed to support the priority areas listed in the ERRP.

2.5 Department of Mineral Resources and Energy (DMRE) Strategic Priorities and Outcome-Oriented Goals

Further to the NDP and MTSF, the objectives of the CGS have been formulated to also support the objectives of the DMRE, whose core focus revolves around regulation, transformation and promotion of the minerals and energy sectors as well as provision of sustainable and affordable energy for growth and development to all South Africans.

Other objectives of the DMRE to which the CGS aligns and supports include, but not limited to contributing to:

- A just transition to a low carbon economy
- Unlock South Africa's high potential mineral and energy resources
- Diversify supply of mineral resources in support of both mining and energy sectors
- Increased investment in mineral and petroleum sector, onshore and offshore
- Increase in South Africa's share of the global minerals and energy market
- Increase in South Africa's share of the Global exploration budget
- Diversify energy sources through implementing IRP2019
- Increased infrastructure investment by both public and private sectors
- Inclusive, equitable and competitive exploration
- Ensure sufficient and relevant skills in the mining and energy sector

In furtherance of sustainable mining, the CGS also undertakes environmental studies that seek to attain appropriate stewardship in the sector, in accordance with the Constitutional prerogatives. In this regard, studies on Acid Mine Drainage (AMD) as well as strategic mine water management programmes are undertaken to support the DMRE.

The contribution towards upliftment of rural communities typically located in distal geographic areas remains one of the focal points of Government. Interventions in geosciences have been developed to impact the intended development of communities.

2.6 Department of Science and Innovation (DSI) Strategic Priorities and Outcome-Oriented Goals

The strategic priorities and outcome-oriented goals of the DSI mainly focuses on research and a technology development environment that supports attainment of the national socio-economic

development imperatives. Accordingly, the afore-stated goals are underpinned by a deliberate investment in the generation of knowledge and human capital development through direct investment as well as partnerships. The CGS, as a science council, is one of the key entities that, through its functions, collaborates with and supports the work of the DSI and the 2019 White Paper on Science, Technology and Innovation.

In this regard, the applications of *Fourth Industrial Revolution (4IR)* and *Artificial Intelligence (AI)* are finding expression in the geosciences in furtherance of improving service delivery and significantly enhancing the response to addressing societal challenges. The CGS welcomes the establishment of the 4IR as chaired by the President of the Republic of South Africa

3. Updates to relevant court rulings

No court rulings affecting the CGS.

PART B: OUR STRATEGIC FOCUS

4. Updated situational analysis

4.1 External Environmental Analysis

4.1.1 Macro Socio-Economic Trends — South Africa

¹Over the last two decades, South Africa has accomplished enormous social progress by bringing to millions of citizens access to key public services, notably education, health, housing and electricity. Enrolment in primary schools is universal for both boys and girls. ²Between 2002 and 2019, the proportion of households with access to an improved source of water increased by less than four percentage points (growing from 84,4 percent to 88,2 percent). The number of households linked to the supply of electricity from the mains rose from 76.7% in 2002 to 85.0% in 2019. (Statistics South Africa, 2019).

The COVID-19 pandemic has impaired an economic outlook that is already fragile. ³In 2020, the South African economy plummeted, reporting an 8% negative growth balance due to the COVID-19 outbreak in year 2020. Growth is expected to pick up in 2021, estimated at 3% of GDP, and steady at 1.54 % in 2022. Unemployment increased from 25.16% to 28.48% in year 2020 (Figure 1)⁴. The youth are particularly hard hit by the economic slowdown, with an unemployment rate of 55.95% in 2020⁵.

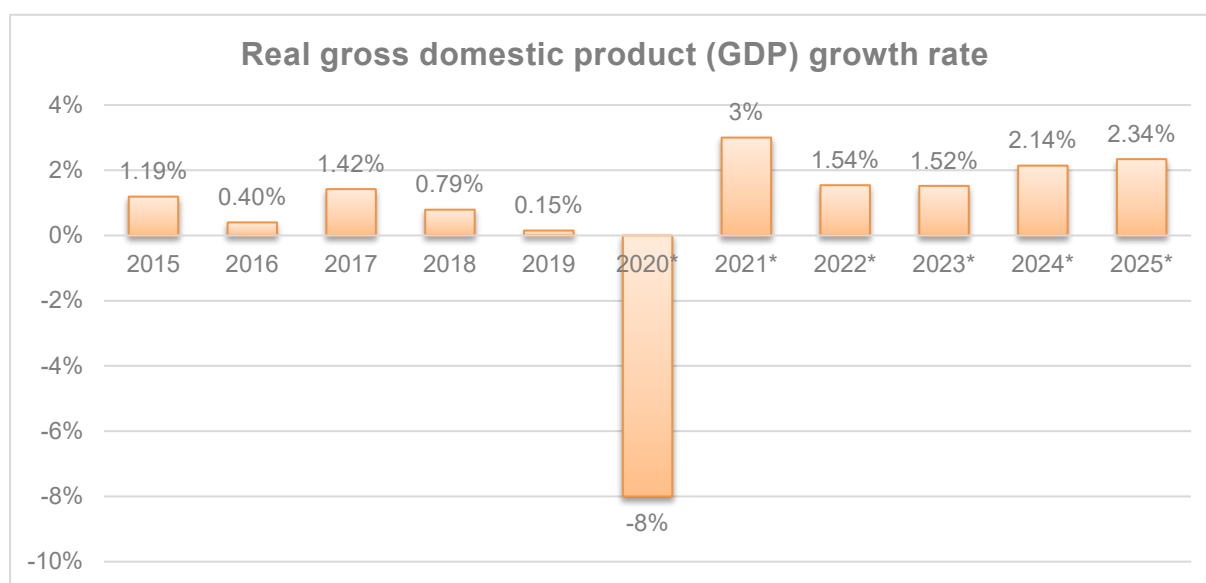


Figure 1: South Africa: Real gross domestic product (GDP) growth rate from 2015 to 2025

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¹ OECD Economic Surveys — South Africa

² http://www.statssa.gov.za/?page_id=1856&PPN=P0318&SCH=72766

³ <https://www.imf.org/en/Countries/ZAF>

⁴ <http://www.statssa.gov.za/?p=13633>

⁵ <https://www.statista.com/statistics/813010/youth-unemployment-rate-in-south-africa/>

⁶ <https://www.statista.com/statistics/370514/gross-domestic-product-gdp-growth-rate-in-south-africa/>

⁷ <https://www.imf.org/en/Countries/ZAF>

⁸ <http://www.statssa.gov.za/?p=13633>

⁹ <https://www.statista.com/statistics/813010/youth-unemployment-rate-in-south-africa/>

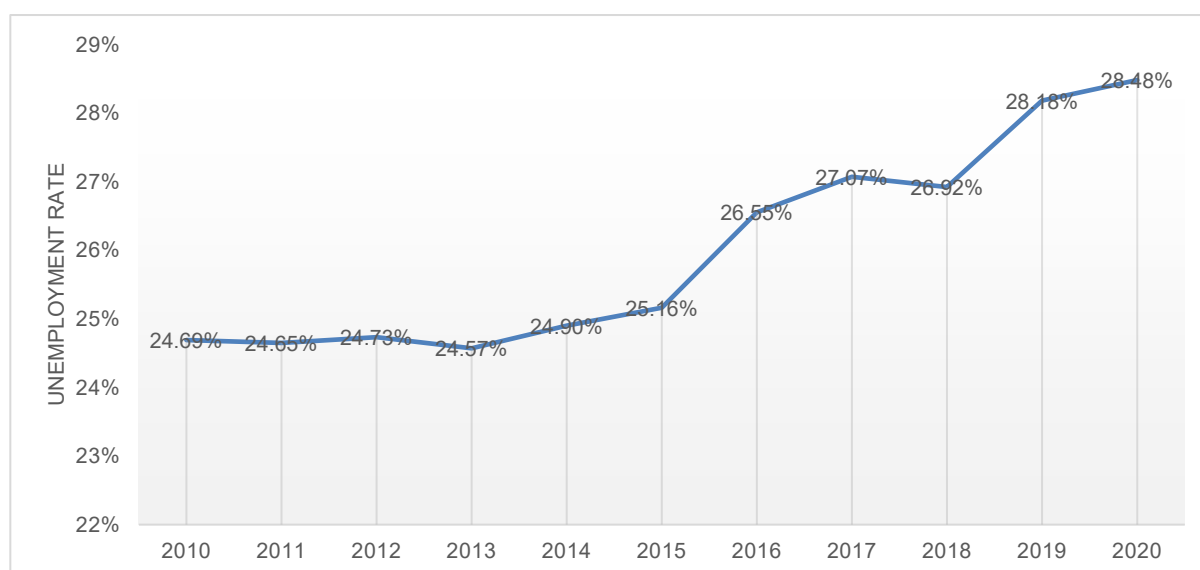


Figure 2. South Africa: Unemployment rate from 2010 to 2020¹⁰

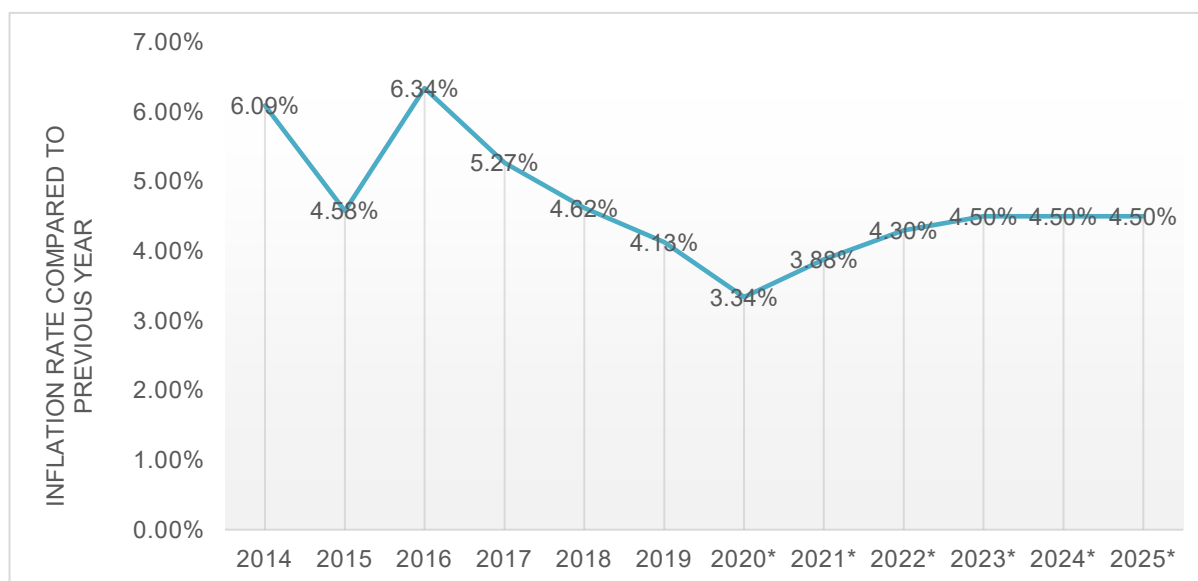
Despite a challenging economic environment and limited fiscal space in South Africa, the government has maintained a highly redistributive policy. Approximately 68% of government spending goes towards social objectives, including education, health, social grants and basic services. Since the beginning of the COVID-19 crisis, the government has decided to augment all social grants and to extend benefits to some uncovered categories such as informal workers. A temporary caregiver grant was also introduced. Moreover, the government has swiftly put in place an income replacement scheme through the Unemployment Insurance Fund. Nonetheless, the COVID-19 pandemic is hitting employment, threatening livelihoods of millions of individuals and affecting social achievements of government policies.

The levels of poverty, unemployment and inequality remain unacceptably high, threatening to reverse the gains of a democratic dispensation over the past 25 years. However, South Africa plans to restart growth, by restoring confidence and opening routes for long-term stable growth. Investment in infrastructure, education and skills is therefore crucial to boost potential growth¹¹.

The COVID-19 outbreak and the related containment measures have led to a severe contraction in economic activity. The economy in South Africa is set to recover progressively from recession as sectors sequentially reopen. Owing to the COVID-19 shock, wage and price inflations are likely to remain muted and continue revolving below the Reserve Bank's 4.5 percent inflation target. Inflation is trending down. At 3% in April 2020, inflation stood at a record low since June 2005. Inflation will be contained in the near term due to the collapse in demand, low imported inflation – particularly from oil – and moderate food price pressures⁸.

¹⁰ <https://www.statista.com/statistics/370516/unemployment-rate-in-south-africa/>

¹¹ OECD Economic Surveys: SOUTH AFRICA, 2020



¹²Figure 3. South Africa: Inflation trend from 2014 to 2025

⁸Fiscal policy reacted cogently to the COVID-19 pandemic. The Temporary Employer/Employee Relief Scheme managed by the Unemployment Insurance Fund has provided income support to around 2 million employees. Social benefits/grants were augmented and two additional grants deployed to cover, in particular, informal workers who never received any kind of social transfers.

Several interventions to improve investor confidence have been proposed, which are critical to reverse weak investment and employment growth. These are also part of the South African Economic Reconstruction and Recovery Plan and include aggressive infrastructure investment, energy security, green economy interventions, support for tourism recovery and growth; employment orientated strategic localization, reindustrialization and export promotion and strengthening food security, amongst others.

4.1.2 Mining Industry Overview

Mining companies continued to enjoy the gains in commodity prices, assisted by a weaker rand. The improved profitability resulted in increased gains and distributions to shareholders, corroborated by a near doubling of taxes paid to governments and strong balance sheets. The mining sector again outperformed the JSE All Share Index and even outperformed the global mining¹³

In 2020, total market capitalisation increased to R1,280 billion from R840 billion. This total is a R439 billion (52%) YOY increase from 2019, largely attributed to the increase in market capitalisation of companies within the gold and PGM sectors. Gold and PGM accounted for 80% of the market capitalisation of the companies analysed this year and continue to dominate the sector.¹⁴

For the year ending June 2020, overall sales increased by 38%. The total revenue generated by the South African mining industry for the year ended 30 June 2020 grew by 4%. This was mainly driven by PGMs, gold and iron ore, which saw increases in revenue for the 12-month period. PGM generated the largest portion of revenue (28%), demonstrating a 56% increase from the previous year, overtaking coal for the first time since 2010. Gold mining companies had an increase of 35% in revenue. Revenue for the 'other mining' segments increased by 7%.

¹² <https://www.statista.com/statistics/370515/inflation-rate-in-south-africa/>

¹³ <https://www.pwc.co.za/en/publications/sa-mine.html>

¹⁴ <https://www.pwc.co.za/en/press-room/sa-mine-2020.html>

The SA Mine entities, cash generated from operations after working capital changes increased by 50% from the previous year. The gold and PGM sectors were the largest contributors, each contributing R24 billion to the increase in cash generated from operating activities. Capital expenditure grew with a net increase of 5%.

Companies and investors have increasingly been recognising the importance of prioritising environmental, social and governance (ESG) matters on the corporate agenda.

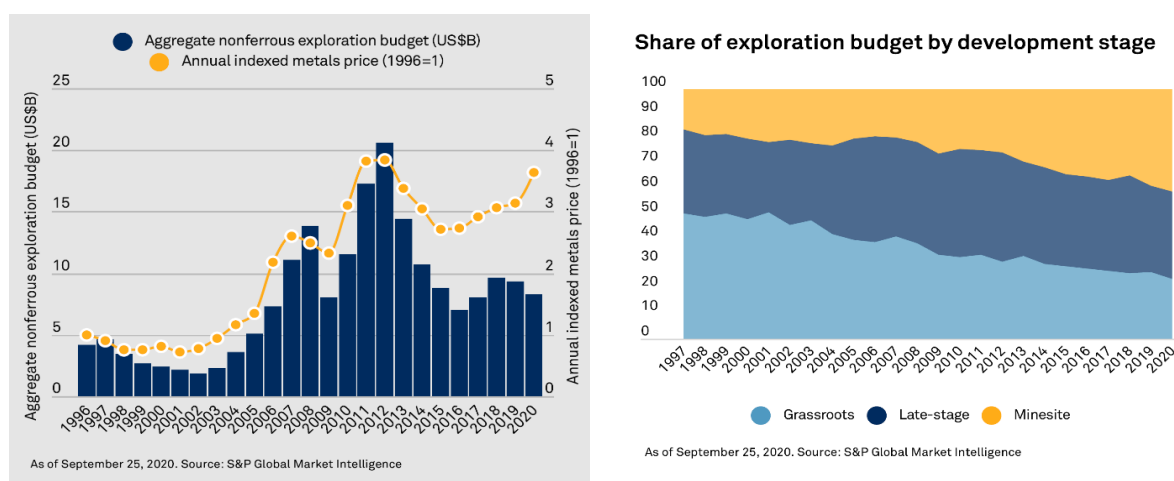
Hydrogen has long been a topic of discussion in the mining industry. Several transportation projects in the sector have been strongly focused on the use of PGMs in fuel cell catalysts.

Although the entire country has been covered in terms of maps at the scales 1:1 million and 1:250 000, the detailed geological published map coverage of South Africa at 1:50 000 scale remains uncompetitively at 9%. Consequently, the country has fallen out of the global top-ten exploration expenditure against peer jurisdiction whose comparative detailed geological mapping is correlatively highest. The South African Government has re-affirmed its commitment to investment in the implementation of the integrated and multidisciplinary geoscience mapping programme (the IMMP) by the CGS, which seeks to significantly enhance the knowledge and understanding of the geosciences in the country.

4.1.3 Impact of the Covid-19 pandemic on Minerals Exploration and Mining

Newly released 2020 global exploration budget data from S&P Global Market Intelligence's Corporate Exploration Strategies series¹⁵ shows that while there was renewed positive sentiments in the latter part of 2019, COVID-19 pandemic resulted in reduced exploration spending in 2020.

In a survey of 2,500 public and private companies, it was established that in 2020 a global aggregate nonferrous exploration budget was US\$8.3 billion, which increased to US\$8.7 billion if companies spending less than US\$100 000 are included. Gold accounted for 52% or over US\$4.3 billion of the total global exploration budget, followed by copper (21%), lead-zinc (5%) and nickel (4%). COVID-19 pandemic had a disproportionate impact on the exploration in 2020. Regional lockdowns led to difficulties in large-scale exploration efforts broadly, which led to a decline to just over US\$2 billion for grassroots budgets, with late-stage exploration down to US\$2.90 billion and mine site exploration decreasing to US\$3.43 billion (Figure 4).



¹⁵ https://pages.marketintelligence.spglobal.com/global-mining-exploration-trends-2020.html?utm_medium=referral&utm_source=marketo&utm_campaign=MI-PC-EMC-MM-MM-MIplatform-GL-201022-2021-Planning&utm_content=2021-planning-essentials

The energy transition is shaping current trends in the mining industry and sector today, in which the cornerstone is a proliferation of renewable resources. Understanding the drivers of the buildout of renewable generation is key to managing the risks and realizing the opportunities that come together at the intersection of policy, regulation and markets. The evolution also includes broader shifts, such as reducing carbon emissions and deploying advanced technologies that change the way energy users interact with the grid and their local utilities¹⁶.

The importance of State's investment in geosciences to improve South Africa's attractiveness as an exploration jurisdiction cannot be overstated. The CGS has therefore adjusted its plans to concentrate the Geoscience Technical Programme (GTP) to projects that will yield immediate impact to the economic recovery and reconstruction plan. To this end, the CGS will be characterising the mineral potential over several base metal prospects in addition to the "minerals of the future" that include Lithium and REE, which will play a critical role in the renewable energy space.

¹⁶ <https://www.spglobal.com/marketintelligence/en/news-insights/blog/six-trends-shaping-the-industries-and-sectors-we-cover-in-2021>

4.1.4 PESTEL Analysis

The external environment consists of variables/forces that are outside the sphere of influence of the CGS and therefore are not typically within the control of the organisation. These variables shape the context within which the organisation exists and present it with threats and opportunities that have the potential to either retard or stimulate strategic success. The variables include, albeit not limited to diverse factors such as rapid technological change, evolution of policies, the socio-economic climate and energy. The following factors were assessed by means of the PESTEL analysis:



Figure 5: PESTEL analysis.

Political: The CGS reports to and supports the Ministry of Mineral Resource and Energy (DMRE) in executing its mandate and priorities. The CGS takes direction from the strategic goals of the DMRE in developing its own strategies. As a science council, the CGS also reports on scientific research and innovation to the Department of Science and Innovation (DSI). Other Government policies and priorities such as transformation are central to the normalisation of the longstanding irregularities of society, in keeping with the democratic values of the country. To this end, the CGS subscribes to the transformation agenda in respect of, inter alia, broad-based black economic empowerment, employment equity and economic growth. The timeframe for implementation of the geoscience programmes is often inconsistent with the tenure of the shareholder executive and by extension introduces some vagaries in the priority areas of the incumbent executive.

Economic: The COVID-19 pandemic has triggered the deepest economic recession in nearly a century, threatening health, disrupting economic activity, and hurting well-being and jobs¹⁷ in many countries. The slow rate of recovery from the global economic downturn has meant that the Government's fiscal strength is accordingly limited. The CGS appreciates this possible constraint, but mitigates it in presenting a strategy that seeks to provide requisite quality data with profound impact on long term national developmental and investment decisions. Further, the slow recovery has the potential

¹⁷ <https://www.oecd.org/coronavirus/en/themes/global-economy>

to limit Government's ability to fund the delivery of the CGS mandate due to other pressing and competing socio-economic priorities.

The growing demand for geoscientific information in Africa, the Middle East and other jurisdictions presents an avenue for the CGS to collaborate with other protagonists in its various fields of expertise and supplement the Government grant.

Exploration for mineral commodities: The global budget for nonferrous metals exploration decreased by 11% to an estimated US\$8.7 billion in 2020 from US\$9.8 billion in 2019. Exploration budgets decreased modestly in 2020, due primarily to travel restrictions and lockdowns in response to the COVID-19 pandemic. S&P Global Market Intelligence's survey of 2,500 exploring companies in 2020 revealed that the global aggregate nonferrous budget decreased 10% to US\$8.3 billion year over year. Although uncertainty remains, exploration in 2021 is predicted to reverse the pandemic-induced losses of 2020 and rise 15%-20% year over year¹⁸. It has been established that jurisdiction with major investment in geoscientific programmes secure a lion's share of the annual exploration budget, while the corollary remains valid. South Africa's share of this budget has shrunk to a fraction of a percent. The President of the Republic has affirmed the importance of the mining industry as a sunshine industry, notwithstanding its long heritage. Accordingly, the Minister of Mineral Resources and Energy has pronounced on measures to increase South Africa's share to 5% in the next five years, including the State's deliberate investment in the geoscience knowledge.

Social/Cultural: The CGS, as a science council, takes cognizance of its social and cultural environment and ensures that it responds accordingly. The increased participation and advocacy of society on issues relating to, amongst others, incremental demand for economic growth and jobs, infrastructure development, mineral resources development, energy security as well as the preservation of the natural environment and cultural heritage influence the approach of the CGS and also have the potential to impact on both the profile and the value of services provided by the CGS to society, taking into account the vast disparities in stakeholder expectations.

Energy Security: As the global population continues to rise, the demand for cost competitive energy will also rise. Energy security is vital in every society because it is largely the basis for social and economic development, health, food security and poverty alleviation. South Africa's increased demand for cost competitive security of energy has never been more pronounced. In this regard, an energy basket comprising traditional as well as new sources of energy has never been more eminent. This results in unprecedented growth in the demand for alternative minerals that support renewable energy, such as battery minerals, which will result in a renewed search for minerals contributory to these sources of energy. Accordingly, South Africa adopted a low-carbon economic growth trajectory that requires urgent attention to sustainable and cost-effective sources of energy. Such energy sources potential as geothermal energy, battery minerals, uranium/thorium prevalence, coal, etc. are a subject of the programme of the CGS, all of which are located within the context of the climate change paradigm.

In December 2017, the General Assembly of the United Nations (UN) proclaimed 2019 as the International Year of the Periodic Table of Chemical Elements (IYPT2019). The UN recognised the importance of raising global awareness of how chemical elements in the periodic table can promote sustainable development and how their application can provide solutions to global challenges in energy, education, agriculture and health sectors¹⁹. Clean energy technologies such as wind, solar and batteries rely on a large amounts of minerals and metals (e.g. cobalt, nickel, manganese, lithium, copper and rare-earth metals also known as REEs) to work.²⁰ Therefore, more demand for the minerals, elements

¹⁸ <https://www.spglobal.com/marketintelligence/en/media-center/press-release/global-exploration-budget-fell-11-to-87-billion-in-2020>

¹⁹ <https://iupac.org/united-nations-proclaims-international-year-periodic-table-chemical-elements/>

²⁰ <https://www.carbonbrief.org/explainer-these-six-metals-are-key-to-a-low-carbon-future>

and metals that make these technologies possible will be sustained. The CGS programmes will also focus on the search for such critical minerals, elements and metals.

Food Security: The NDP Vision 2030, SDGs 2030 and Agenda 2063 identify food security as key in addressing both poverty and inequality and make reference to a number of requisite steps to improve food security by including sustainable agriculture, expansion of the use of irrigation, security of land tenure, especially for women, and the promotion of nutrition education. Food security, is however, threatened by various factors such as globalisation, urbanisation, international trade regimes, climate change, and the poor storage and distribution of food.

The strategy of the CGS further focuses on geoscience programmes that will contribute towards land use, groundwater and the environment, all of which are contributory to the national food security programme.

Technological: Technological advancement enables the CGS to respond to the expectations and requirements of its stakeholders in order to ensure service delivery. The innovative utilisation of emerging mapping technologies for the gathering of data improves the effectiveness and efficiency of the CGS in delivering on its mandate. The rapid development of technology provides the CGS with major opportunities in the areas of research, innovation, skills development and service delivery.

Investment in scientific research and technological development is a catalytic imperative for innovation. This will enable the organisation to be responsive, competitive and relevant.

The dawn of the Fourth Industrial Revolution presents opportunities for application in the geosciences to enhance data collection accuracy, and improve the speed and quality of data interpretation. The introduction of artificial intelligence and machine learning in geoscience presents opportunities for the CGS to, not only be current, but substantially improve the quality of geoscience outputs in real time.

²¹The President of South Africa established a Presidential Commission on the Fourth Industrial Revolution (4IR) to identify and recommend policies, strategies and plans that are needed to position South Africa as one of the leading countries in the evolution and development of the 4IR. The President indicated that Government would prioritise interventions to take advantage of rapid technological changes. The main focus will be the development of an integrated national strategy and plan to respond to the 4IR to include detailed interventions to be carried out in achieving competitiveness of the key economic sectors, including agriculture, finance, mining, manufacturing, ICT and electronics, and business with science, technology and innovation as a cross-cutting enabler.

Environmental: Natural environmental and man-made hazards create a need for geological information and solutions to mitigate these hazards, e.g. infrastructure development on ground that is prone to sinkhole formation, tsunamis, earthquakes, acid mine drainage, groundwater pollution, air pollution and global warming. The natural environmental challenges dictate the programmes and mitigating strategies that the CGS should address.

Changes in climatic conditions, i.e. when conducting fieldwork, will mostly affect the CGS operationally in terms of the effective and timely delivery of projects and services.

Climate change: Climate change is referred to as a change in average weather conditions or in the time variation of weather within the context of longer term average conditions and it is caused by various factors such as biotic processes, variations in solar radiation received by Earth, plate tectonics and volcanic eruptions. Greenhouse gas emissions from human activities are also believed to accelerate the rate of climate change. The members of the global nations have formed a coalition of the willing

²¹ No. 42078 Government Gazette, 4 December 2018

and are in agreement to work towards limiting global temperature rise to well below 2 degrees Celsius. **⁴Rapidly growing cities and ongoing effects of climate change** are making more people vulnerable to rising sea levels. Two-thirds of the global population is expected to live in cities by 2050 and already an estimated 800 million people live in more than 570 coastal cities vulnerable to a sea-level rise of 0.5 metres by 2050. In a vicious circle, urbanisation not only concentrates people and property in areas of potential damage and disruption, it also exacerbates those risks — for example by destroying natural sources of resilience such as coastal mangroves and increasing the strain on groundwater reserves. Intensifying impact will render an increasing amount of land uninhabitable.

The CGS is implementing the Carbon Capture Utilisation and Storage (CCUS) project, which aims to curb the emissions of CO₂ and therefore reduce the nation's carbon footprint. Most importantly, the CGS is assessing the utilisation options where CO₂ and its outputs could be used for, among other, enhancement of geothermal energy generation, development of construction materials, enhanced coal-bed methane (ECBM). This approach not only is consistent with the stated intentions of the NDP2030, but also the IRP 2019.

The CGS will continue investigating interventions to reduce the quantities of greenhouse emissions such as possible storage options for carbon dioxide and identifying alternative sources of energy.

Legislative: The CGS is a creature of statutes and any changes to the legislative framework (see Section 3.2) will have a direct impact on the strategy and operations of the organisation. In developing the five-year strategy of the CGS, these factors have been considered to enable the organisation to take full advantage of opportunities to adjust and navigate within the legislative framework to contribute to the creation of a prosperous society for all within South Africa.

Table 1 summarises the major strengths and weaknesses of the CGS as well as the major threats and opportunities facing the organisation.

Table 1: CGS SWOT Analysis.

	Strengths	Weaknesses
	<ul style="list-style-type: none"> Support through Government grant funding through line Departments (i.e. DMRE) A sound historical heritage, investible geoscience data and information accumulated over a 100-year period as major strategic asset that can be leveraged to develop the economy of South Africa. Scientific research experience and strong knowledge base (generator of knowledge). Good understanding of the South African natural resources and environmental landscape. Empowering legislative mandate. Developer and incubator of pipeline of geoscience expertise through the bursary and internship programmes – contribution to human capital development and expansion of knowledge enterprise. Capacity to strengthen commercial/collaborative and Intellectual Property revenue generation 	<ul style="list-style-type: none"> A limited capacity of highly qualified, experienced and skilled scientists near retirement. Inadequate access to external exploration data Limited utilisation of vast historical geological information. Semi-digital and disparate internal systems – delayed technical advancements A very low coverage of high-quality, integrated, multidisciplinary maps in South Africa for mineral exploration and infrastructure development. Lack of organisational growth due to intermittent supplementary funding (i.e. ring-fenced funding from MTEF projects).
INTERNAL	Opportunities	Threats
	<ul style="list-style-type: none"> Collaboration opportunities with various Government departments, science councils, international entities in geoscientific research as well as universities to facilitate regional integration and leverage on resources including human capital building, etc. Innovative utilisation of geoscientific information in various emerging fields such as medical geology and geometallurgy through the priorities of the fourth industrial revolution. Transformation, growth and development of world-class scientists. Implement geoscience programmes to give effect to the National Development Plan priorities and respond to post Covid-19 economic recovery measures. Opportunity to leverage on programmes to support the just transition energy policy. Enhancing the advisory position of the CGS through Policy/legislation interventions. 	<ul style="list-style-type: none"> Disruptive events such as the Covid-19 pandemic. Increased criminality that leads to increase in operational costs. Slow economic growth that threatens sustainable revenue generation. Funding of geoscience programmes across multiple state entities can lead to duplicative and uncoordinated work being performed). Inadequate integration and coordination across Government entities. Challenges of access to land to implement the geoscience programmes. Data and information security
EXTERNAL		

4.1.5 Stakeholder Analysis

An effective stakeholder engagement strategy is a key requirement for the CGS: (1) to fulfil its legislative mandate and (2) to leverage optimal delivery through collaborative relationships that enhance and nurture the development of the geosciences.

The CGS is accountable to, and has to align with a wide network of internal and external stakeholders. The various functions within the organisation, both core and support, are interdependent and have to be aligned internally and across stakeholder groupings in order for the CGS to operate effectively in the execution of its mandate. Primary stakeholders include, but are not limited to Parliament of the Republic of South Africa, the DMRE, the National Treasury, the DSI, the employees, organised labour, service providers, communities and the broader South African public. The secondary stakeholders critical for the CGS include, amongst others, international geological survey organisations, geoscience organisations, institutions of higher learning, mining companies, media, and Non-Government. The CGS is a state-owned entity and, by extension, an instrument of Government that has been established to execute aspects of national foreign policy through bilateral agreements with other countries. Table 2 summarises the various stakeholder groupings of the CGS. In this regard, the Geoscience Diplomacy Programme of the CGS has been developed and implemented to coordinate strategic partnerships with stakeholders outside South Africa.

Table 2: Stakeholder Analysis.

External and Internal Stakeholders					
Stakeholder List	Characteristics/ Attributes	Influence	Interest	Action Point to deliver on	*Linkages with other stakeholders (Direct / Indirect)
CGS Board	Social, Strategic and Political Partners	H	H	Keep Satisfied, Manage and inform	Direct
Parliament of South Africa		H	H	Keep Satisfied and Inform	Direct
DMRE		H	H	Keep Satisfied, Manage and Inform	Direct
Government and related Departments (e.g. DSI, National Treasury, DPME, DWS, DFFE, DALRRD, DHS, DTIC, Department: Tourism, DPWI, DIRCO, Economic Development Department), DHET), SANDF)		H	H	Keep Satisfied	Direct
Provincial Departments,		H	L	Manage Closely	Direct
Municipalities		H	L	Keep Satisfied, Manage Closely	Direct
Traditional Councils		H	L	Keep Satisfied, Manage Closely	Direct
Communities (Direct projects)		H	L	Keep Satisfied, Manage Closely	Direct
General Public		H	L	Keep Informed	Indirect
Media		H	H	Manage Closely and Inform	Direct
NGOs and Chapter 9 Institutions		H	L	Manage Closely	Direct
Nature Conservation Institutes		H	L	Manage Closely	Indirect
Regional Integration Partners, e.g. the African Union (AU) and the Organisation of African Geological Surveys (OAGS)		L	L	Keep Informed	Indirect
CGS Employees and Organised Labour		H	H	Keep Satisfied and Inform	Direct
Geological Surveys	Public and Private Institutions	L	H	Manage Closely	Direct
AU and Regional Structures, such as SADC		L	H	Keep Informed	Indirect

External and Internal Stakeholders					
Stakeholder List	Characteristics/ Attributes	Influence	Interest	Action Point to deliver on	*Linkages with other stakeholders (Direct / Indirect)
Spatial Planning and Development Companies, Science Councils, Minerals Council South Africa (former Chamber of Mines), etc.		H	L	Keep Satisfied	Direct
Development Bank	Financial Resources Structures	L	H	Manage Closely	Direct
Insurance Companies		L	H	Manage Closely	Direct
Universities	Professional Institutions	L	H	Manage Closely	Direct
Research Institutions		L	H	Manage Closely	Direct
Geological Society of South Africa and similar Institutions		L	H	Manage Closely	Direct

* Linkages with other stakeholders- Classification on how the different stakeholders have a direct / indirect linked impact to the work of CGS. H: High, L: Low

Various opportunities exist to strengthen stakeholder relations and to establish opportunities for networking, learning, alignment and integration. An initiative that the CGS could explore to strengthen stakeholder relations is the consideration of bi-annual stakeholder interventions — national, continental or international. These interventions would provide marketing platforms for the CGS to create visibility and awareness of the CGS, to disseminate information, and to showcase the current and planned work of the CGS.

The Intergovernmental Relations Framework Act (Act No. 13 of 2005) prescribes principles for the national government, provincial and local governments, and all organs of state to facilitate coordination in the implementation of policy and legislation, including, but not limited to the effective provision of services, monitoring the implementation of policies and legislation, and the realisation of national priorities. The Act makes provision for the establishment of intergovernmental structures for coordinating actions across government departments when implementing policies or legislation, for the execution of statutory functions (taking into account the circumstances, material interests and budgets of other government departments) and to consult, cooperate and share information to achieve the objectives of the Act.

An opportunity presents itself for the CGS to explore the potential for establishing an intergovernmental forum comprising key stakeholders (e.g. DMRE, DSI, DFFE, etc.). This forum would have the authority to establish rules and principles for the endorsement of cross-government departmental projects and programmes, and the approval of the transfer or allocation of resources (financial or otherwise) across departments in the execution of the integrated and multidisciplinary geoscience mapping programmes. The identified projects/programmes would support the achievement of national objectives, considering the collective mandates and functions of various Government departments. This would allow the CGS to access and/or share resources with other Government departments for projects and programmes that have to be funded and executed in national interest, enabling the optimal use of grant funding and other resources across departments, without additional demands on the fiscus.

4.2 Internal environment analysis

4.2.1 Overview of the CGS

The strategically re-oriented IMMP was adopted by the CGS Board in June 2017 and it purposefully focused on implementation of its mandate, as stipulated in the Geoscience Act, Act No 100 of 1993 and amended in 2010. The IMMP is developed to foster the sustainability of the organisation in a constantly changing state of polity, the economy, society and the ever-shifting scientific and technological landscape. The CGS's strategy (i.e. the IMMP) is intended to maintain an impactful delivery of the core mandate. To provide innovative geoscience solutions that respond to current and future societal challenges as well as national imperatives. It supports the NDP 2030 and other Government priorities that address economic growth, poverty, inequality, job creation, education, clean water, affordable and clean energy, and safer communities amongst others.

The IMMP strategy aims to map the land surface (both onshore and offshore) of South Africa at a greater level of detail, not only geologically, but also geophysically, geochemically and geotechnically to produce a new generation of more detailed maps to serve as a base to advise the State and various stakeholders, including the public. Marine geoscience mapping (offshore mapping) also feature prominently, in line with the objectives of marine Operation Phakisa. The IMMP priorities contributes to the ERRP and include but not limited to:

- Digitally migrate all geoscience data (Contributions to the digital economy)
- Facilitate growth of the exploration activities in SA to secure a minimum of 5% of the global exploration budget (Building South Africa's Minerals Resource Wealth)
- Catalysing the blue economy development, in line with the Oceans Operation Phakisa (through management of South Africa's Marine Jurisdictions)
- Securing future Energy resources (implementation of the IRP 2019)
- Contribute to an improved carbon capture technologies (for the reduction of greenhouse gas emissions and transition to a low carbon growth trajectory)
- Geoscience research that contributes to food security, infrastructure development, water and environment (Ensuring Community Safety, Land and Infrastructure Development and Securing South Africa's Water Resources).
- Improve African collaborations (contributions to African Continental Free Trade priority)
- Grow scientific skills (embracing the cross-cutting areas: women, youth and people with disabilities) to execute the IMMP (contributions to priority number 1 and 3)
- Embrace applications of the 4IR and AI in geosciences (leading geoscience innovation)

The GTP represents the technical programme model of the CGS that covers integrated projects taking into cognizance the interconnectivity of various geoscientific disciplines for an impactful contribution to the broad government mandated programmes. The CGS GTP is subdivided into five core themes and these include:

1. Geoscience for Minerals and Energy:

The South African Government pronounced on its bold plan to capture a minimum of 5% of the global exploration budget of approximately US\$10 billion (reduced to US\$6.8 billion because of the COVID-19 pandemic) per annum in the next three to five years. The CGS has a privilege of being placed at the leading edge of rejuvenating and re-imagining the exploration landscape, consistent with the quality of geology that suggests that the country remains a proverbial exploration frontier jurisdiction. Accordingly, The CGS participates in a number of DMRE led initiatives to provide necessary geoscientific/technical support sought to attain the afore-stated intention.

The contribution of the CGS to energy security and the “Just Energy Transition” policy tenet is located in the numerous projects that constitute the GTP of the CGS. These include the geothermal research potential, whose early results are yielding positive results of this prospect that will augment the sustainable renewable energy programme in the medium to long term. In addition, the characterisation of non-traditional coalfields, such as Molteno coalfields in the Eastern Cape, presents ideal opportunities for South Africa to explore production of hydrogen and REE from the development of coal resources, in a manner that embraces renewable energy and significantly mitigates the “carbon” footprint. Importantly, the CGS is also undertaking research and development toward the implementation of Carbon Capture, Utilisation and Storage technologies in South Africa. This programme aims to ensure that South Africa meets its climate change mitigation scenarios, while still enabling the support and growth of the hydrocarbon sector.

Progress on implementation of this thematic area of the CGS technical programme, albeit at early stages of deployment, gives sufficient confidence that the much needed inclusive economic growth, coupled with the energy security needs of the country can be re-catalysed and attained with the support of the CGS’s technical programmes contributing to such this intent.

2. Geoscience for Health, Groundwater and Environment:

The CGS fulfils its advisory role to the DMRE on promotion of environmental stewardship. To this extent, twenty five (25) high-risk unsafe mine openings have been sealed by the end of 2020/2021 FY, while the CGS has also restructured what is colloquially duped the D & O project in order to exclusively focus on the research of impact induced by the orphaned mines on society and advise the State on apposite corrective action to be taken. The redesign has brought an opportunity for the CGS to strengthen the research aspect that includes integrated monitoring (air, soil, water, etc.) around legacy mines, mineral assessments for future mining of dumps and resuscitating local economies of historical mining towns. The Mine Water project has completed the construction of the Van Ryn Canal as an ingress control measure. The work done, which includes passive treatment piloting, coexistence of mining and biodiversity, will continue in the couple of years (at least).

The CGS developed innovative machine learning techniques that use the integrated and multidisciplinary geoscience datasets to map groundwater resources. These techniques were successfully tested in the Maluti-a-Phofung project to site and drill a high-yielding well for the communities in the area. These innovative techniques are now being used to undertake critical groundwater research in the surrounding regions facing water challenges.

3. Geoscience for infrastructure and land use:

The CGS has a mandate to continue mapping the extent of areas that are susceptible to subsidence, such as in dolomitic rock, which knowledge is used to advise the State on its infrastructure development and optimal land use options. The extent of dolomitic layers nationally continued to be delineated using known boreholes. Artificial intelligence tools have been developed to predict the development of subsidence in dolomitic areas. The CGS’ national geohazard mapping programme focuses on mapping landslides potential at city scale in order to assist municipal spatial planning efforts. The national seismic network continues to detect natural and mining-induced earthquakes in South Africa on a continuous 24-hour basis.

4. Geoscience for innovation

The CGS is steadily strengthening its scientific innovation capacity in all areas of the geosciences. Models have been produced from machine learning algorithms to develop predictive capabilities in areas such as geohazards (subsidence), mineral, benthic habitats and water mapping.

5. Geoscience for Diplomacy

As the permanent Secretariat of the Organisation of African Geological Surveys (OAGS), the CGS promotes the development of close relations between African member states in geoscience research. The OAGS represents the interests of African geological surveys at international platforms and continues its close collaboration with the European Geological Surveys in implementing the PanAfGEO programme that specifically envisages capacity building across the African continent.

The CGS has renewed collaboration with the Namibian and Malawian geological surveys for the implementation of high-resolution geological mapping projects. These initiatives entail strong elements of training and skills transfer for human capital development.

Geoscience mapping coverage:

- ***Onshore mapping coverage***

Geoscience mapping at various scales is a core discipline at the CGS. The detailed onshore national mapping programme at a scale of 1:50 000 has increased coverage from 5% to 9.03% by the end of FY2020/21.

- ***Offshore mapping coverage***

The importance of the marine environment is recognised as part of the Oceans Phakisa Blue Economy. The marine mapping programme is critical to development of the marine economy and the CGS has accordingly prioritized the multi-disciplinary geoscience mapping of the Economic Exclusion Zone (EEZ) in the short term. This work aims to gain a clear understanding of marine geoscientific processes on the continental shelf (in selected deep seabed strategic areas) as they relate to energy, mineral, climate change initiatives and matters related to ocean governance. The offshore geoscience map coverage has increased by 0.05% by the end of FY2020/2021.

The CGS not only implements its mandate empowered by the Geoscience Act, Act No 100 as amended, but also engages in collaborative projects typically characterised as follows:

- Agency projects: Sourced from other government departments/institutions and public entities;
- Private sector: Collaboration with private sector establishments.

Further to this, the CGS continued to implement mandatory projects to actualise the specific provisions of the Amendment Geoscience Act, Act No 16 of 2010 (e.g., development and maintenance of the national core library, geophysical reference sites) and the successful management of a number of national geoscience facilities, including:

The national seismic network, which monitors seismic activity locally and globally;

- monitoring of the global infrasound activity as part of its collaboration with the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO);
- The national core library, which provides a comprehensive collection of valuable geological materials. The core library has added to its capacity hyperspectral scanning capability;
- The national geoscience museum, which provides information and preserves rare, scientifically valuable and geological heritage samples;

- The national geoscience library and bookshop, which provide geological publications and maps to the public, and
- The national geoscience analytical facility, which is available for the analysis among others, geological samples, water samples and industrial raw materials.

4.2.2 CGS Operating Model

The CGS operating model is informed by the preceding sections of this document and summarises the integrated approach required for the effective execution of the CGS mandate. It summarises the core functions in line with the mandate of the CGS, business model that allows both statutory and collaborative activities as well as other streams of revenue generation, legislative processes, procedures and conventions (triggers) that have to be complied with, enablers that will mobilise execution of the work of the CGS and established interfaces that direct, provide focus and support the work of the CGS.

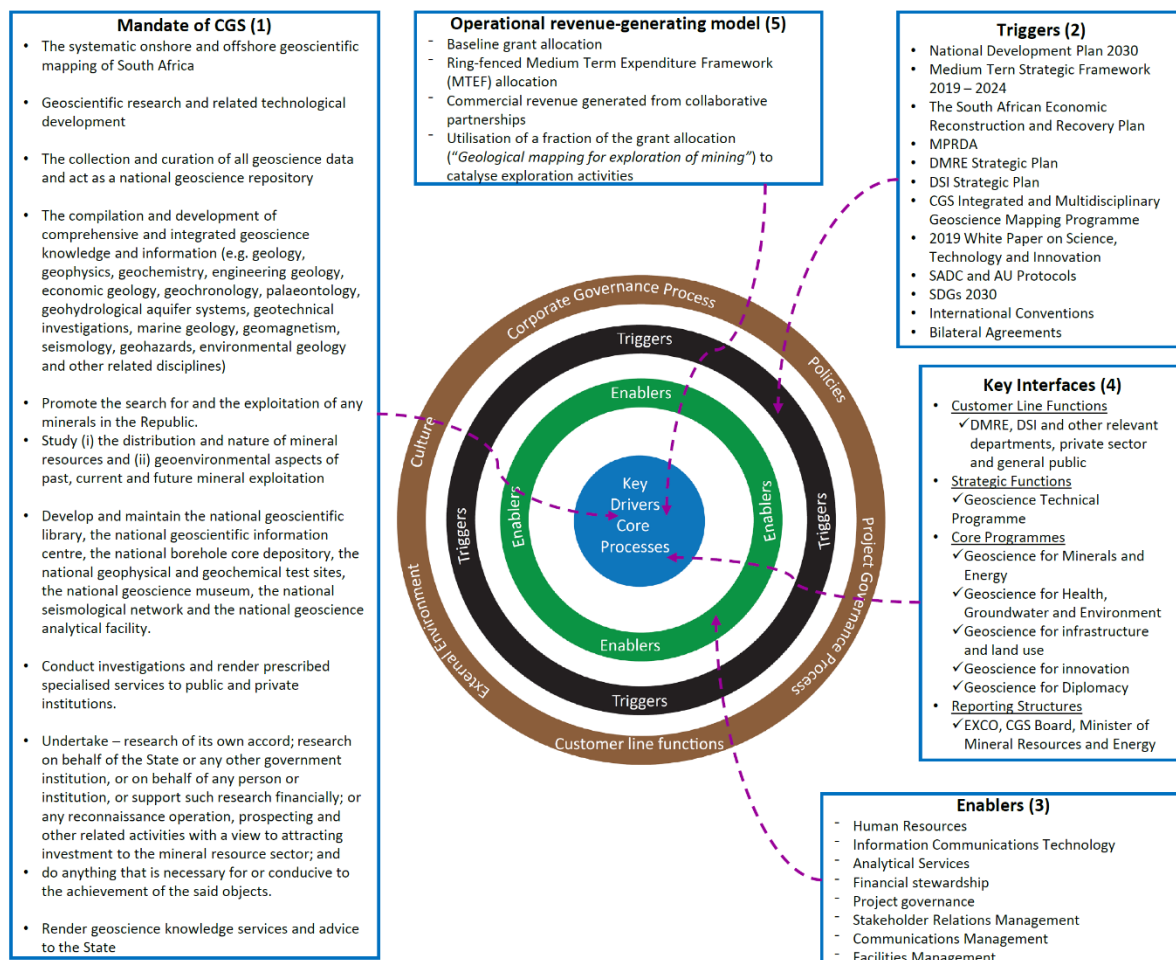


Figure 6: CGS Operating Model.

4.2.3 CGS Organisational environment

The CGS continues realigning its organisational structure (Figure 7) to streamline its core business portfolios for improved efficiency and service delivery as per the adopted strategy (i.e. the IMMP). This intended to achieve its institutional outcome of enhanced applications of geoscience products, which span the five thematic strategic focus areas (see previous section 4.2.1).

In respect of Information Communications Technology (ICT): The CGS is continuously implementing a cost-effective and efficient data centre and infrastructure, which is a crucial element of the CGS's digital transformation.

The CGS has made significant strides in terms of the representation of females, youth and people living with disabilities. Notably, female staff represent 39% of the scientific cohort with African females making up 71%. The representation of people living with disabilities is at 2.25%, which is at an all-time high over the past 5 years due to the in-house disability awareness campaign which encouraged employees to disclose their disabilities. Youth represent 30% of the workforce.

4.2.4 CGS Governance

The Board

The CGS Board which is the Accounting Authority appointed by the Minister of Mineral Resources and Energy approves the strategies, goals, operating policies and priorities of the organisation and monitors compliance with the policies and achievements with respect to scientific, administrative and financial objectives. The Board Members bring independent counsel on strategic decisions. Moreover, Board Members are fully conversant with their fiduciary duties, as outlined in section 50 of the PFMA (Act No. 1 of 1999).

Four Board Committees underpin the Board:

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

Finance Committee

The Finance Committee of the CGS is mandated to consider and recommend for the Board's approval the following matters:

- Significant financial activities;
- Liquidity and financial condition of the CGS;
- Write-off of bad debts;
- Material variances in the approved annual and/or revised budgets in accordance with the Materiality and Significance Framework Plan;
- Proposed capital and operating budget for capital expenditures;
- Financial statements for the annual report;
- All policies that have financial implications, and
- Corporate performance information management against the approved budget.

Technical Committee

The Technical Committee of the CGS is mandated to consider and recommend for the Board's approval the annual scientific and strategic technical programme of the organisation, evaluate the scientific and technical output and oversee the implementation of the ICT strategy as well as the End-term evaluations.

Personnel, Remuneration and Transformation Committee

The Personnel, Remuneration and Transformation Committee is mandated to consider and recommend for the Board's approval the human resources strategies and policies of the CGS. It also considers and recommends for the Board's approval the organisational remuneration model, remuneration for executive management and annual salary increases, and evaluates and makes recommendations on the payment of performance bonuses. The committee also considers organisational performance reports on labour-related matters, employment equity, and employee training and development matters.

Audit and Risk Committee

The Audit and Risk Committee was established in terms of Section 77 of the PFMA and National Treasury Regulation 27. The Audit and Risk Committee discharges its responsibilities in terms of the Audit and Risk Committee Charter, which sets out its committee composition, roles and responsibilities. The Audit and Risk Committee continually monitors the quality and reliability of CGS financial information used by the Board, financial statements issued by the CGS and various functions in the organisation. The Audit and Risk Committee ensures that emerging risks are timeously identified and that appropriate and effective control measures are put in place to mitigate these risks.

The Management

Managers are responsible for the following functions in the organisation:

- Development of the strategic plans and annual performance plans of the CGS for approval by the Accounting Authority;
- Implementation of annual performance plans;
- Management of legal, regulatory, ethical and other compliances;
- Management of CGS operations and service delivery;
- Management of corporate administration;
- Management of corporate performance;
- Management of finances;
- Management of personnel;
- Management of transformation;
- Promotion of the CGS.

In terms of the Code of Ethics and Conduct, all persons serving on behalf of the CGS are required to uphold the highest standard of business ethics and integrity. Furthermore, all staff, contractors, consultants and others acting on behalf of the organisation are required to accurately and honestly represent the organisation and to refrain from engaging in any activity or scheme intended to defraud anyone of money, property or services. The reputation and integrity of the CGS are central to its ability to operate as an effective state-owned organisation.

4.2.5 CGS Organisational Structure

Figure 7 depicts the organisational structure of the CGS that was developed to support the efficient, effective, robust functioning of the organisation as well as service delivery.

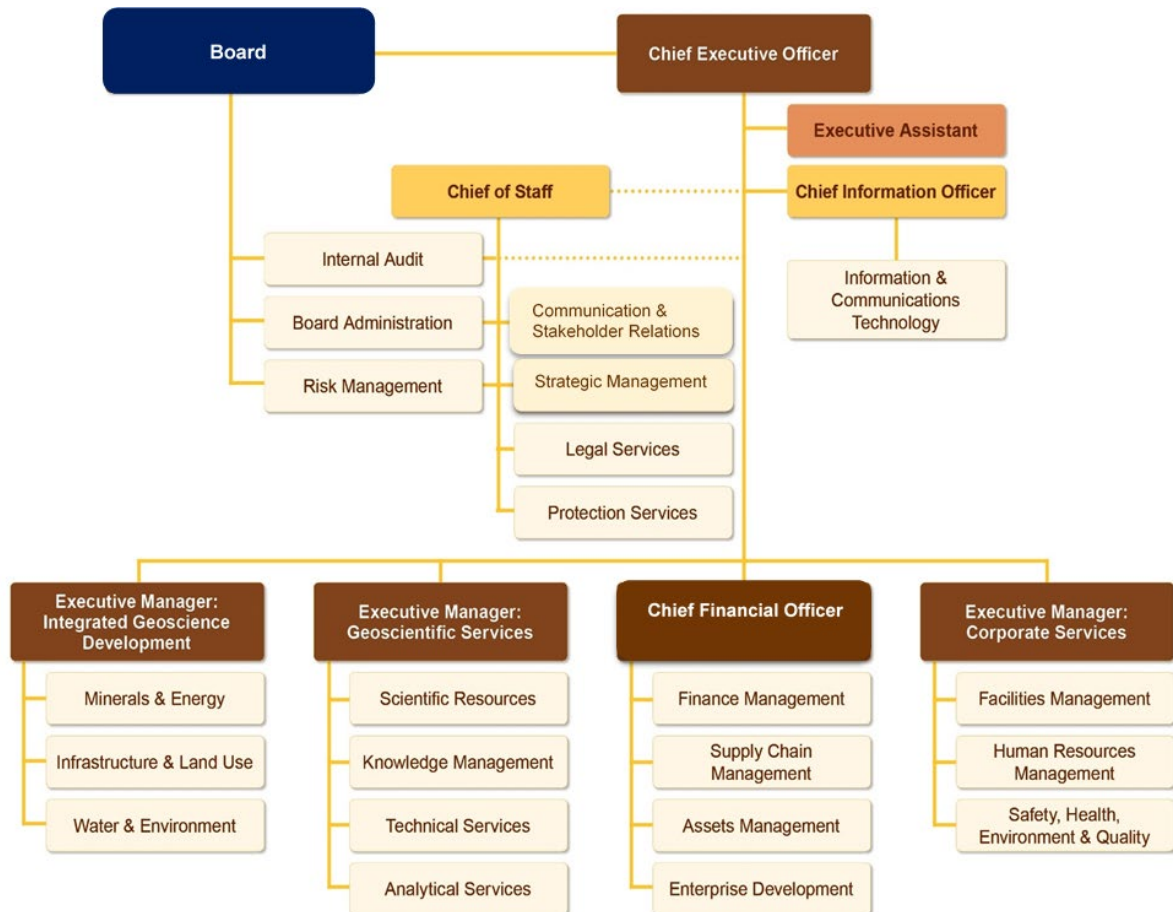


Figure 7: CGS's Organisational Structure.

PART C: MEASURING OUR PERFORMANCE

5. CGS Programmes

5.1 Programme 1: Financial sustainability

Programme 1 Purpose: To ensure effective and efficient delivery of financial management services, to secure funding from the exploitation of collaborative activities and partnerships as well as to generate grant funding.

Programme 1 Goal: CGS financial growth through integrated geoscience services delivery, partnerships and innovation

Table 3: Programme 1 Outcomes, outputs, performance indicators and targets (MTEF Period 2022/23 – 2024/25).

Outcome	Outputs	Output indicators	Audited performance			Estimated performance	MTEF period		
			2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
1) Effective and efficient financial resources management	Audited financial reports	1. Percentage of overhead costs to total costs	New Measure	61.04%	63.00%	≤66%	66%	66%	66%
	Audited financial reports	2. Percentage of personnel costs to total costs	New Measure	65.86%	64.03%	≤70%	70%	70%	70%
	Audited financial reports	3. Revenue from collaborative activities/partnerships	R30m	R29m	R23.2m	R33m	R122.3m	R130.2m	R142.4m
	Audited financial reports	4. Grant revenue	R426.6m	R422.4m	R486.2m	R373.2m	R355.7m	R559.4m	R675.6m

Table 4: Programme 1: Financial sustainability annual and quarterly targets (FY2022/23).

Output indicators	Annual targets	Q1	Q2	Q3	Q4
1. Percentage of overhead costs to total costs	66%*	66%	66%	66%	66%
2. Percentage of personnel costs to total costs	70%*	70%	70%	70%	70%
3. Revenue from collaborative activities/partnerships	R122.3m*	R30m	R50m	R80m	R122.3m
4. Grant revenue	R355.7m*	R110m	R190m	R250m	R355.7m

* Tracking and monitoring will be done on quarterly basis.

5.2 Programme 2: Organisational effectiveness and efficiency

Programme 2 Purpose: To develop and implement effective and compliant policies, procedures and business processes in support of the CGS integrated service- delivery model, adhere to best practice to achieve sustainable governance as well as to provide and operate flexible, expandable and secure ICT solutions.

Programme 2 Goal: A geoscience institution that is capable, effective, efficient, compliant and responsive, through an integrated service-delivery model

Table 5: Programme 2 Outcomes, outputs, performance indicators and targets (MTEF Period 2022/23 – 2024/25).

Outcome	Outputs	Output indicators	Audited performance			Estimated performance	MTEF period		
			2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
1) Effective and efficient financial resources management 2) Compliance with governance protocols/regulations	Audited annual report	5. Number of audit qualifications	0	0	0	0	0	0	0
	Audited annual report	6. Percentage of total Procurement spend on goods and services from Small, Medium and Micro Enterprises (QSE and EME's) in terms of PPPFA of 2017	New Measure	48.25%	40.75%	30%	35%	40%	45%
	Availability report	7. Availability of key enterprise services	New Measure	New Measure	100%	99%	99%	99%	99%

Table 6: Programme 2: Organisational effectiveness and efficiency annual and quarterly targets (FY2022/23).

Output indicators	Annual targets	Q1	Q2	Q3	Q4
5. Number of audit qualifications	0	-	-	-	0
6. Percentage of total Procurement spend on goods and services from Small, Medium and Micro Enterprises (QSE and EME's) in terms of PPPFA of 2017	35%*	35%	35%	35%	35%
7. Availability of key enterprise services	99%*	99%	99%	99%	99%

* Tracking and monitoring will be done on quarterly basis. – no quarterly breakdown of the annual target.

5.3 Programme 3: An empowered, transformed, motivated and capacitated workforce

Programme 3 Purpose: To attract and retain highly skilled scientific personnel in the geoscience industry, To build capacity in respect of geoscientific, administrative and managerial/leadership skills while also developing innovative products, systems and services, To promote and invest in human resources transformation and diversity.

Programme 3 Goal: An employer of choice, attracting, recruiting and retaining highly skilled personnel in the Geoscience industry through improved human capital and institutional knowledge management strategies.

Table 7: Programme 3 Outcomes, outputs, performance indicators and targets (MTEF Period 2022/23 – 2024/25).

Outcome	Outputs	Output indicators	Audited performance			Estimated performance	MTEF period		
			2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
3) Capable human capital	Human Resources Reports	8. Percentage of scientific staff with Masters or Doctoral degrees	New Measure	41.56%	40.47%	≥35%	40%	42%	45%
	Human Resources Reports	9. Percentage of training expenditure to leviabale amount of payroll	1.46%	3.52%	1.20%	≥1%	1%	1%	1%
	Human Resources Reports	10. Staff turnover rate	5.47%	7.99%	5.48%	≤10%	10%	10%	10%
	Human Resources Reports	11. Percentage of staff living with disability	1.59%	1.66%	2.25%	≥1.5%	1.6%	1.8%	1.9%
	Human Resources Reports	12. EE Stats, Scientific cohort (Female representation)	New Measure	New Measure	39%	44%	46%	48%	48%
	Human Resources Reports	13. EE-Stats, Senior management (Female representation)	New Measure	New Measure	New Measure	New Measure	50%	53%	55%
	Human Resources Reports	14. EE Stats, Top management (Female representation)	New Measure	New Measure	20%	20%	40%	40%	40%

EE definitions for Senior and Top Management as per the Commission for Employment Equity.

Table 8: Programme 3: An empowered, transformed, motivated and capacitated workforce annual and quarterly targets (FY2022/23).

Output indicators	Annual targets	Q1	Q2	Q3	Q4
8. Percentage of scientific staff with Masters or Doctoral degrees	40%*	40%	40%	40%	40%
9. Percentage of training expenditure to leviabile amount of payroll	1%*	1%	1%	1%	1%
10. Staff turnover rate	10%*	10%	10%	10%	10%
11. Percentage of staff living with disability	1.6%*	1.6%	1.6%	1.6%	1.6%
12. EE Stats, Scientific cohort (Female representation)	46%*	46%	46%	46%	46%
13. EE-Stats, Senior management (Female representation)	50%*	50%	50%	50%	50%
14. EE Stats, Top management (Female representation)	40%*	40%	40%	40%	40%

* Tracking and monitoring will be done on quarterly basis

5.4 Programme 4: Delivery of the mandate

Programme 4 Purpose: Execute the integrated and multidisciplinary geoscience mapping programme

Programme 4 Goal: An enabling environment in support of national imperatives and enhancing living conditions and creating a safe environment

Table 9: Programme 4 Outcomes, outputs, performance indicators and targets (MTEF Period 2022/23 – 2024/25).

Outcome	Outputs	Output indicators	Audited performance			Estimated performance	MTEF period		
			2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
4) Enhanced applications of geoscience information and knowledge and to secure a minimum of 5% share of the global exploration expenditure	Onshore geoscience maps	15. Onshore geoscience map coverage	New Measure	New Measure	9.03%	9.5%	12%	14%	16%
	Offshore geoscience maps	16. Offshore geoscience map coverage	New Measure	New Measure	0.05%	0.3%	0.2%	0.3%	0.6%
	Value-added geoscience outputs such as integrated reports, 3D models, innovative solutions, mineral systems and emplacement models.	17. Applied geoscience outputs for minerals and energy	New Measure	New Measure	7	4	6	6	8
5) Enhanced geoscience diplomacy	Value-added geoscience outputs such as integrated reports and 3D models, innovative solutions.	18. Applied geoscience outputs for infrastructure, land use, health, groundwater and the environment	New Measure	New Measure	10	5	6	6	8

Table 10: Programme 4: Delivery of the mandate annual and quarterly targets (FY2022/23).

Output indicators	Annual targets	Q1	Q2	Q3	Q4
15. Onshore geoscience map coverage	12%*	10.5%	11%	11.5%	12%
16. Offshore geoscience map coverage	0.2%*	0.11%	0.14%	0.16%	0.2%
17. Applied geoscience outputs for minerals and energy	6*	1	2	3	6
18. Applied geoscience outputs for infrastructure, land use, health, groundwater and the environment	6*	1	2	4	6

* Tracking and monitoring will be done on quarterly basis

5.5 Programme 5: Advisory, stakeholder engagement and knowledge management

Programme 5 Purpose: To improve stakeholder relations through collaborations with strategically aligned institutions, the private sector and the general public.

Programme 5 Goal: An enabling environment in support of national imperatives and enhancing living conditions and creating a safe environment

Table 11: Programme 5 Outcomes, outputs, performance indicators and targets (MTEF Period 2022/23 – 2024/25).

Outcome	Outputs	Output indicators	Audited performance			Estimated performance	MTEF period		
			2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
6) Improved awareness of the CGS brand, services and products	Media articles	19. Number of articles published on media platforms	13	17	25	24	28	32	32
	Stakeholder survey report	20. Stakeholder satisfaction level	64.9%	76%	88.48%	70%	70%	70%	70%
7) Improved geoscientific domain through effective knowledge management	Peer-reviewed articles published in scientific journals, book chapters and edited volumes.	21. Number of peer-reviewed articles published	26	41	33	30	32	34	40
	Examples: memoirs, bulletins, books and atlases.	22. Number of CGS publications	6	12	10	8	8	10	12
	Examples: abstracts, extended abstracts and conference papers and keynotes, etc.	23. Number of papers published in a conference proceedings	136	47	66	25	70	40	55

Table 4: Programme 5: Advisory, stakeholder engagement and knowledge management annual and quarterly targets (FY2022/23).

Output indicators	Annual targets	Q1	Q2	Q3	Q4
19. Number of articles published on media platforms	28*	5	9	13	28
20. Stakeholder satisfaction level	70%	-	-	-	70%
21. Number of peer-reviewed articles published	32*	-	-	-	32
22. Number of CGS publications	8*	1	3	5	8
23. Number of papers published in a conference proceedings	70*	-	-	-	70

* Tracking and monitoring will be done on quarterly basis, – no quarterly breakdown of the annual target.

6. Explanation of planned performance over the medium-term period

The CGS strategy (the IMMP) has been adopted to encourage sustainability of the organisation in a changing state of polity, the economy, society, as well as the scientific and technological landscape. Therefore, the strategic objectives of the CGS are illustrated below (Figure 8), are intended to shift the strategic orientation of the CGS to maintain an impactful delivery of the core mandate that will result in the improvement in the economy and the lives of South Africans. The balanced scorecard (BSC) methodology has been embraced to provide an account of the overall performance of the organisation. The BSC essentially measures the performance of the organisation at corporate business unit and individual level. There are five strategic objectives that cover the customer, internal business process, learning and growth and financial perspectives. These strategic objectives are aligned to the NDP 2030 as well as the MTSF 2019-2024 priorities and addresses the cross-cutting areas for women, youth and people with disabilities.

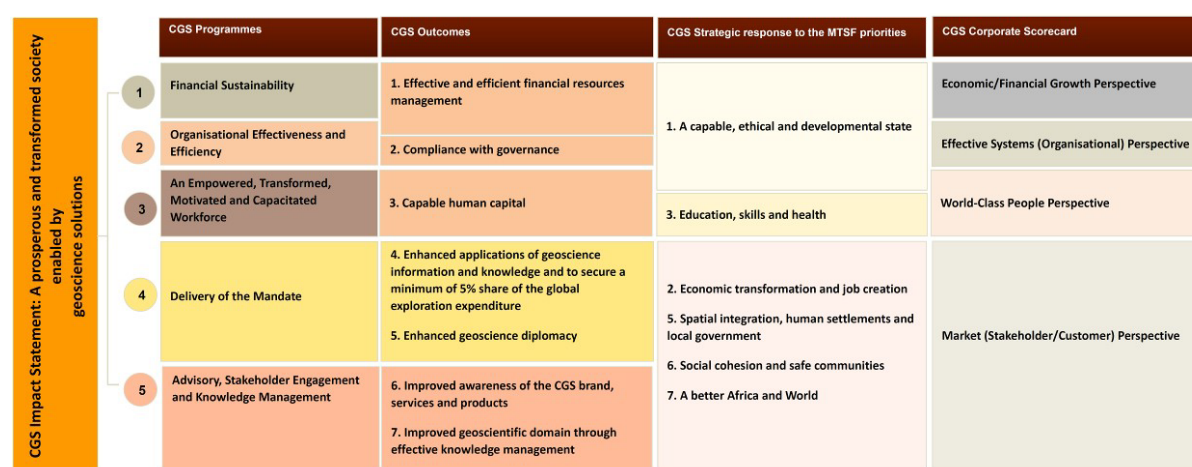


Figure 8: The alignment of CGS Strategic Programmes and Outcomes to the priorities of the MTSF 2019-2024 as well as the BSC.

The CGS plans of achieving its impact “A prosperous and transformed society enabled by geoscience solutions” is anchored on seven institutional outcomes [i.e. 1) Effective and efficient financial resources management, 2) Compliance with governance protocols/regulations, 3) Capable human capital, 4) Enhanced applications of geoscience information and knowledge and to secure a minimum of 5% share of the global exploration expenditure, 5) Improved awareness of the CGS brand, services and products, 6) Improved geoscientific domain through effective knowledge management as well as 7) Enhanced geoscience diplomacy] that will be pursued over the five-year period. The institutional outcomes have also been mapped with related outputs and are all outlined in Table 3, 5, 7, 9 and 11 of this document. Outputs listed in each programme (refer to section 5) will contribute in achieving the intended outcomes and impact outlined in the Strategic Plan 2020 -2025 of the CGS.

7. Programme resource considerations

7.1 Overview of 2022/23 Budget and MTEF Estimates

The financial resource requirements over the five-year period are summarised below. These projections consider the scope of work of the CGS, supply chain management function in support of project execution, as well as the optimisation of underutilised movable and immovable assets.

Table 5: Income Statement.

INCOME (RAND)	FY - 2021/22	FY - 2022/23	FY - 2023/24	FY - 2024/25	FY - 2025/26	FY - 2026/27
	x 1 000	x 1 000	x 1 000	x 1 000	x 1 000	x 1 000
Government grant	377 062	355 761	559 458	675 602	706 004	737 774
Deferred Income	188 336					
Sales and contracts	32 210	122 317	130 188	142 441	153 801	166 167
Sundry income	4 276	4 490	4 714	4 950	5 197	5 457
TOTAL INCOME (RAND)	601 884	482 568	694 360	822 993	865 002	909 398
EXPENDITURE (RAND)	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
	x 1 000	x 1 000	x 1 000	x 1 000	x 1 000	x 1 000
Personnel costs	316 946	342 117	378 065	408 065	436 630	467 194
Bursaries	4 481	4 930	5 423	5 965	6 561	7 217
Commercial project costs	14 495	55 043	58 585	64 098	69 210	74 775
Overheads and operating costs	222 045	63 478	225 287	322 865	330 601	338 212
SUBTOTAL	557 967	465 568	667 360	800 993	843 002	887 398
Surplus before Capital Expenditure	43 917	17 000	27 000	22 000	22 000	22 000
Application of Surpluses:						
Capital expenditure						
Vehicles and Aircrafts	3 500	5 000	5 000	5 000	5 000	5 000
Equipment	12 000	12 000	22 000	17 000	17 000	17 000
Deferred : Building and Laboratory Infrastructure	-	-	-	-	-	-
Deferred: Digital information System; buildings; equipments and facilities	28 417	-	-	-	-	-
SUBTOTAL	43 917	17 000	27 000	22 000	22 000	22 000
TOTAL EXPENDITURE (RAND)	601 884	482 568	694 360	822 993	865 002	909 398

The CGS has two sources of funding, namely the Government grant and collaborative/contract revenue. These revenues determine the scope of the GTP of the CGS.

Due to the lack of certainty in the contract revenue stream, the CGS implements its programmes for each year with caution in order to avoid over-expenditure or losses. In the 2020 MTEF, an additional baseline allocation is made to the amount of R345,8m. These allocations are made in tranches of R70,0m; R128,0m and R147,8m for the financial years 2020/21; 2021/22 and 2022/23 respectively in respect of the Geological mapping for the exploration of mining and will continue over the medium term.

In the 2022 MTEF, the CGS has received additional allocations of R500m (R0m in 2022/23; R200m in 2023/24 and R300m in 2024/15) over the medium term for the geoscience activities which includes the onshore and offshore map coverage in support of the National Exploration Strategy. This means that the implementation of economic recovery onshore and offshore mapping projects in the CGS will be accelerated to augment contribution towards the South African ERRP.

Revenue from Government Grant

The Government grant consists of the baseline grant funding for the MTEF period. In the 2022 MTEF an additional baseline allocation of R500m (R0m in 2022/23; R200m in 2023/24 and R300m in 2024/25) was made for the geoscience activities which includes the onshore and offshore map coverage in support of the National Exploration Strategy. Technical adjustments were implemented on the MTEF projects where funding for the Rehabilitation of derelict and ownerless mines and the Water Ingress Solutions was moved to commercial revenue to align to the DMRE's budget classifications in compliance with the National Treasury budget classification circular. The Government grant allocations are R377,1m, R355,7m, R559,5m, R675,6m, R706,0m, R737,8m for the financial years 2021/22, 2022/23, 2023/24, 2024/25, 2025/26 and 2026/27 respectively.

Table 6: Analysis of Government Grant Allocation.

Item	FY - 2021/22	FY - 2022/23	FY - 2023/24	FY - 2024/25	FY - 2025/26	FY - 2026/27
	x 1 000	x 1 000	x 1 000	x 1 000	x 1 000	x 1 000
Government grant	565,4m	355,7m	559,5m	675,6m	706,0m	737,8m
Baseline allocation	198,2m	207,9m	405,0m	514,2m	537,3m	561,5m
MTEF Projects (Ring Fenced)	50,9m	0	0	0	0	0
Deferred Income	188,3m	0	0	0	0	0
Geological mapping for exploration of mining	128,0m	147,8m	154,5m	161,4m	168,7m	176,3m
Analytical and research work for the Geoscience Laboratory	0	0	0	0	0	0
Commercial Revenue	32,2m	122,3m	130,2m	142,4m	153,8m	166,1m
Sundry income	4,3m	4,5m	4,7m	4,9m	5,2m	5,5m
TOTAL REVENUE (RAND)	601,9m	482,5m	694,4m	822,9m	865,0m	909,4m

Revenue from Collaborative/Partnership Activities

Revenue from collaborative activities is budgeted at R32,2m for FY2021/22. From the 2022/23 financial year, the revenue is budgeted at R122,3m and includes R70,0m for commercial contracts and R52,3m for the DMRE's MTEF projects. This revenue stream is expected to increase at an average rate of 7.8% over the next five financial years. There is a concerted effort that is directed at growing this revenue stream in order to achieve financial sustainability.

Personnel Costs

The personnel costs budget includes salaries for existing and additional critical positions, fringe benefits, such as death and disability insurance, post-retirement medical aid insurance as well as recruitment-related costs. Annual salary increases are negotiated at the bargaining forum and are approved by the CGS Board. Personnel costs are budgeted at R316,9m for FY2021/22 and subsequently a 7% increase year on year has been added over the five financial years. In the FY2023/24 the personnel cost will increase to R378,1m to cater for the increased capacity for the quantum of work related to additional allocation of resources made in the 2022 MTEF for the geoscience activities including onshore and offshore map coverage in support of the National Exploration Strategy. A recent benchmarking exercise was conducted and depicted a picture that CGS salary scales are low compared with those of industry. Both financial and non-financial strategies are implemented to sustain human capital requirements.

Bursaries

The bursary budget is essential for developing capacity and to expedite the training of individuals. The commercial environment in which the CGS competes for international and national tenders is extremely competitive and the only way for the CGS to be able to win tenders is by upgrading the skills of its staff members. The bursary scheme has an added advantage as it also serves as a feeder pipeline for the transformation of the staff complement. In this regard, an amount of R4,2m has been budgeted for FY2021/22, with a 10% increase year on year over the five financial years.

Cost of Collaborative/Partnership Projects

The CGS invests in the commercial environment to generate the budgeted revenues. These investments are in the form of direct materials and services required to deliver the agreed commercial outputs. Commercial project expenditure is budgeted at R14,4m for FY2021/22, which is 45% of the projected revenue for each year over the five financial years. The expenditure will increase to R55,0m due to the increase in the budgeted collaborative revenue which will now include the two DMRE MTEF projects, the Rehabilitation of derelict and ownerless mines and the Water Ingress Solutions.

Overheads and Operating Costs

This budget is for the scientific programme, i.e. GTP expenditure, the operating costs of the mandatory functions such as the geoscience library, core library, laboratory, maintenance of buildings and infrastructure and administration requirements for Finance, Supply Chain, Corporate Services and Integrated Communication Technology. The budget increases in proportion to the total Government grant and the costs are budgeted in proportion to the revenue. Overhead and operating costs are budgeted at R222, 0m for FY2021/22. A significant decrease in the budget in FY2022/23 is due to the discontinued additional allocations for the analytical and research work and the technical adjustments made to realignment the MTEF projects budget to commercial contracts. In FY2023/24 the budget will increase to R225,3m due to the additional allocations made in the 2022 MTEF for the geoscience activities including onshore and offshore map coverage in support of the National Exploration Strategy.

Scientific and Technical Equipment

The rapidly aging research infrastructure of the CGS is of great concern to the organisation. Over the past few years, attention has been given to the replacement of some equipment. However, this is not sufficient to sustain services and skills development in the CGS.

An amount of R15,5m has been budgeted for the replacement of vehicles, equipment and aircraft repairs for FY2021/22. In the FY2023/24 the budget will increase to R27m to accommodate the quantum of work related to additional allocation of resources made in the 2022 MTEF for the geoscience activities including onshore and offshore map coverage in support of the National Exploration Strategy. A capital renewal plan is developed annually to address the infrastructure requirements.

7.2 Link between the Budget and Strategic Programmes

Table 7: Link between Budget and Strategic Programmes.

CGS Strategic Programmes	2021/22	2022/23	2023/24	2024/25	2025/26	2025/26
Programme 1: Financial Sustainability	67 038 441	53 748 906	55 062 311	58 251 483	61 426 844	64 800 463
Programme 2: Organisational effectiveness and efficiency	105 260 358	84 393 804	86 456 045	91 463 522	96 449 312	101 746 398
Programme 3: An empowered, transformed, motivated and capacitated workforce	15 010 888	12 035 167	12 329 257	13 043 360	13 754 369	14 509 772
Programme 4: Delivery of Mandate	398 456 374	319 467 365	527 273 849	646 229 331	678 602 723	712 765 502
Programme 5: Advisory, stakeholder engagement and knowledge management	16 117 939	12 922 758	13 238 538	14 005 305	14 768 752	15 579 866
Total Budget	601 884 000	482 568 000	694 360 000	822 993 000	865 002 000	909 398 000

7.3 Materiality framework

Table 8: Materiality Framework.

Nature of Business	Circumstances giving rise to Need for Disclosure in Terms of Materiality and Significance	Material Threshold Value for Disclosure and Reporting Purposes	Process to be initiated if Threshold is reached
<p>Geophysics and Research</p> <p>Generally, research-related entities may set a materiality figure higher than for non-research-related entities, as research-related losses can be expected to be higher and more difficult to anticipate and manage within the normal accounting practices, Geoscience Act and operating procedures. Disclosure in this area is unlikely to materialise</p>	<p>Equipment and Technology</p> <p>Laboratories and Geophysics are the two main areas giving rise to the need for disclosure in terms of materiality and significance</p> <p>Laboratories</p> <p>Geophysics</p> <p><i>Consideration in terms of expenditure was given as follows: (as included within the budgeting process)</i></p> <ul style="list-style-type: none"> <i>Irregular Expenditure consisting of spending outside of approved budget</i> <i>Fruitless and Wasteful Expenditure. Equipment not suited or necessary for purpose</i> 	<p>Calculating the property and equipment threshold value at 2% of the value as indicated in the annual financial statements (R335, 804, 000)</p> <p>R6,7m</p> <p>R6,7m</p> <p>The usual accounting practices and the Geoscience Act will generally cover replacement or loss of equipment in the normal operational process and should not require disclosure</p>	<p>Management to submit a report with all relevant details and values concerned to the Executive for comment and disclosure to Treasury where required</p> <p><i>Process:</i></p> <ul style="list-style-type: none"> <i>Information to be provided regarding event;</i> <i>Investigate where required: Internal Audit and Finance;</i> <i>Determine whether loss is due to contravention of the Act or disregard of Geoscience Act;</i> <i>Determine whether due to lack of due care and diligence, gross negligence or criminal activity, and</i> <i>Responsibility</i> <p>The Executive must direct a request for ruling or approval from Treasury or the relevant Executive Authority</p>
<p>The business needs to ensure that all financial transactions fall within the approved budget and are conducted within the normal accounting practices and Geoscience Act</p>	<p>Financial</p> <p>Operations and Capex are considered as the main areas giving rise to the need for disclosure in terms of materiality and significance:</p> <p>Operating Expenditure</p> <p><i>(Existing Budgeted Projects)</i> <i>Any irregular spending outside of approved budget</i></p> <p>New Projects</p>	<p>R2,2m</p> <p>Operating threshold value calculated at 1% of budget value (R222,045,000)</p> <p>Expressed as 2% of the Project Value</p>	<p>Management to submit a report with all relevant details and values concerned to the Executive for comment and disclosure to Treasury where required</p> <p><i>Process:</i></p> <ul style="list-style-type: none"> <i>Information to be provided regarding event;</i> <i>Investigate where required: Internal Audit and Finance;</i> <i>Determine whether loss is due to contravention of the</i>

	<p><i>Unforeseen additional expenditure due to poor project planning or early termination or cancellation of projects</i></p> <p>Capex: -</p> <p>Total Assets</p>	<p>This threshold will vary according to the project value. E.g. R40m equates to R800,000 and R10m equates to R200,000</p> <p>R14,8m</p> <p>Total asset threshold value calculated at 2% of the value as indicated in the annual financial statements (R741,428,000)</p>	<p><i>Act or disregard of Geoscience Act;</i></p> <ul style="list-style-type: none"> <i>Determine whether due to lack of due care and diligence, gross negligence or criminal activity; and</i> <i>Responsibility</i> <p>The Executive must direct a request for ruling or approval from Treasury or the relevant Executive Authority</p>
<p>In terms of the PFMA Section 54, information will be submitted by the accounting authorities in respect of any significant change in the nature or extent of its interest in a significant business activity; and</p> <p>A significant change in the nature or extent of its interest in a significant partnership, trust, unincorporated joint venture or similar arrangement</p>	<p>Where the business has joint ventures or similar arrangements, these are strictly governed by the Geoscience Act in addition to the PFMA</p> <p>Concluding any transaction in terms of Section 54 without approval from the Executive Authority</p>	<p>Should such an event materialise it would need to be investigated and only then would the potential loss be determined</p> <p>No threshold can be anticipated</p> <p>Any transgression is to be investigated and reported once all relevant details have been compiled</p>	<p>Management to submit a report with all relevant details and values concerned to the Executive for comment and disclosure to Treasury where required</p> <p><i>Process:</i></p> <ul style="list-style-type: none"> <i>Information to be provided regarding event;</i> <i>Investigate where required: Internal Audit and Finance;</i> <i>Determine whether loss is due to contravention of the Act or disregard of Geoscience Act;</i> <i>Determine whether due to lack of due care and diligence, gross negligence or criminal activity, and</i> <i>Responsibility</i> <p>The Executive must direct a request for ruling or approval from Treasury or the relevant Executive Authority</p>

8. Updated key risks and mitigation from the Strategic Plan

Table 9: CGS key risks and their mitigation plans.

Outcomes	Key risks	Contributing factors	Risk mitigations
1. Effective and efficient financial resources management	Inadequate funding to implement the mandate	<ul style="list-style-type: none"> • Misalignment between short term funding and long term strategy • Insufficient and declining baseline grant allocation • Reduced commercial/ collaborative income generation due to constrained economic activities 	<ul style="list-style-type: none"> • Request for and exploring sustainable funding for CGS. • Intensify business development efforts. • Enhanced financial management efficiencies and stewardship.
2. Capable human capital	Failure to deliver on the CGS mandate and meet stakeholder needs	<ul style="list-style-type: none"> • Inadequate talent management. • Misalignment between short term funding for positions and long term strategy • Inadequate specialised skills to deliver on the mandate 	<ul style="list-style-type: none"> • Attract, develop and retain requisite skills.
3. Improved geoscientific domain through effective knowledge management	Inadequate ICT support and security services	<ul style="list-style-type: none"> • Non-integrated systems and databases • Inadequate knowledge repository • Inadequate assimilation of data from industry 	<p>Implement the enterprise resource planning system.</p> <p>Provision of ICT infrastructure to enable data collection from industry.</p> <p>Implement document management system.</p>
4. Enhanced applications of geoscience information and knowledge and to secure a minimum of 5% share of the global exploration expenditure.	Non-delivery of the mandate	<ul style="list-style-type: none"> • Misalignment of the GTP with government priorities. • Insufficient support to government priorities • Insufficient funding to execute the mandate 	<ul style="list-style-type: none"> • Align the GTP to the government priorities and fully implement the integrated approach.
5. Improved awareness of the CGS brand, services and products	Insufficient brand communication and insufficient stakeholder awareness	<ul style="list-style-type: none"> • Uncoordinated implementation of stakeholder engagement plan / programme. • Incomplete stakeholder database and centralised recording of stakeholder engagements • Inadequate communication and 	<p>Continuous implementation of communication and stakeholder relations plan.</p> <p>Purposeful, intentional and focused key communication messages.</p>

Outcomes	Key risks	Contributing factors	Risk mitigations
		stakeholder relations strategy	
6. Enhanced geoscience diplomacy	Inability to form collaborative international partnerships	<ul style="list-style-type: none"> Changes in geopolitical environment Changes in international policy and economies Global pandemics 	Intensification of monitoring and evaluating the geo-political landscape to identify appropriate collaborative opportunities.
7. Compliance with governance protocols/regulations	Non-Compliance with legal and regulatory requirements	<ul style="list-style-type: none"> Insufficient advocacy and awareness of the regulatory protocols. Ineffective enforcement and monitoring of regulatory requirements Inadequate ethical culture 	<ul style="list-style-type: none"> Improve the compliance checklist, monitoring process and reporting on key legislation. Establish a plan with specialised external trainers on risk, compliance and fraud awareness. Increase awareness of policies and regulatory requirements at quarterly staff meetings and induction sessions.

9. Public entities

Name of public entity	Mandate	Outcomes	Current annual budget (R thousands)
Not Applicable			

10. Infrastructure projects

No.	Project name	Programme	Description	Outputs	Start date	Completion date	Total estimated cost	Current year expenditure
Not Applicable								

11. Public-Private Partnerships (PPPs)

PPP name	Purpose	Outputs	Current value of agreement	End-date of agreement
Not Applicable				

PART D: TECHNICAL INDICATOR DESCRIPTIONS (TIDs)

1. Indicator Title	Percentage of Overhead Costs to Total Costs
Definition	All non-project related costs expressed as a percentage of total costs
Source of data	Finance Management – This information is obtained from the financial system
Method of calculation or assessment	Overhead costs/Total costs X 100
Means of verification	Financial Reports (Management Accounts)
Assumptions	Expenditure budgets and financial reporting
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	A performance equal to or below the set threshold.
Indicator responsibility	Chief Financial Officer
2. Indicator Title	Percentage of Personnel Costs to Total Costs
Definition	All staff related costs expressed as a percentage of total costs
Source of data	Finance Management – This information is obtained from the financial system
Method of calculation or assessment	Staff costs/Total costs X 100
Means of verification	Financial Reports (Management Accounts)
Assumptions	Expenditure budgets and financial reporting
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	A performance equal to or below the set threshold.
Indicator responsibility	Chief Financial Officer
3. Indicator Title	Revenue from Collaborative Activities/Partnerships
Definition	Revenue earned from commercial/collaborative activities or partnerships
Source of data	Finance Management – This information is obtained from the financial system
Method of calculation or assessment	Commercial revenue generated
Means of verification	Financial Reports (Management Accounts)
Assumptions	Continued commercial/collaborative revenue generation
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	Attain or exceed the set target
Indicator responsibility	Chief Financial Officer
4. Indicator Title	Grant Revenue
Definition	Value of government grant transfers recognised
Source of data	Finance Management – This information is obtained from the financial system
Method of calculation or assessment	The sum of baseline and conditional grant recognised/utilised
Means of verification	Financial Reports (Management Accounts)
Assumptions	Grant revenue allocated
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A

	Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	To achieve the set target
Indicator responsibility	Chief Financial Officer
5. Indicator Title	Number of Audit Qualifications
Definition	Total number of audit qualifications as reported on in the Auditor-General's audit report
Source of data	Annual Report as per the Auditor General's audit report
Method of calculation or assessment	Number of qualifications
Means of verification	Audit Report
Assumptions	Annual external audit
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually
Desired performance	Zero audit qualifications
Indicator responsibility	Chief Financial Officer
6. Indicator Title	Percentage of total Procurement spend on goods and services from Small, Medium and Micro Enterprises (QSE and EME's) in terms of PPPFA of 2017
Definition	Procuring from Black Exempt Micro Enterprises (EME's) and Qualifying Small Enterprises (QSE's). Percentage procurement expenditure on goods and services from Small Micro and Medium Enterprises (SMME's) of the total local procurement expenditure
Source of data	Supply Chain Management and Enterprise Development Management
Method of calculation or assessment	Total cost of goods and services procured from Exempt Micro Enterprises (EME's) and Qualifying Small Enterprises (QSE's) divided by the total local procurement expenditure expressed as a percentage
Means of verification	Creditors payment Report
Assumptions	Budget available to spend
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Empower and Support SMME procurement to play a meaningful role in the mainstream economy of South Africa and make inroads into untransformed sectors
Indicator responsibility	Chief Financial Officer
7. Indicator Title	Availability of Key Enterprise Services
Short definition	Availability of key enterprise services including MS Exchange (email), Finance and HR systems, databases and applications
Source / collection of data	Information and Communications Technology. Infrastructure management dashboard
Method of calculation or assessment	Percentage uptime of key enterprise services
Means of verification	ICT Report
Assumptions	ICT infrastructure in place
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Availability of ICT services (%)
Indicator responsibility	Chief Financial Officer

8. Indicator Title	Percentage of Scientific Staff with Masters or Doctoral Degrees
Short definition	Percentage of scientific staff that have Masters or Doctoral degrees in relation to the total number of scientific staff. Scientific staff means any employee at the CGS with a scientific qualification or involved in the scientific programmes (who book time on the timesheet system)
Source / collection of data	This information is obtained from personnel records
Method of calculation or assessment	Total number of scientific staff with Masters or Doctoral degrees/Total number of scientific staff X 100. (Masters includes MSc and MTech and Doctoral includes PhD and DTech) – excluding interns
Means of verification	HR report
Assumptions	Completion of studies Interest to study
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	A performance greater than the target is desirable
Indicator responsibility	Executive Manager: Corporate Services
9. Indicator Title	Percentage of Training Expenditure to Leivable Amount of Payroll
Short definition	Total training expenditure of staff and non-staff on leivable amount of payroll expressed as a percentage
Source / collection of data	Accounting system
Method of calculation or assessment	Percentage of training expenditure to leivable amount of payroll – excluding interns
Means of verification	HR report
Assumptions	There is continuous training requirements
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Effective utilisation of allocated expenditure on training and development
Indicator responsibility	Executive Manager: Corporate Services
10. Indicator Title	Staff Turnover Rate
Short definition	Percentage of employees who have left the organisation
Source / collection of data	VIP system
Method of calculation or assessment	Number of staff who have left the organisation during the reporting period divided by the total number of staff at beginning of the reporting period multiplied by 100 yielding a percentage. Staff means permanent and fixed-term contracts on permanent positions, excluding contractors and interns.
Means of verification	HR report
Assumptions	Staff retention measures are effective
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Achieve turnover lower than target
Indicator responsibility	Executive Manager: Corporate Services
11. Indicator Title	Percentage of Staff Living with Disability
Short definition	Staff living with disabilities as reported
Source / collection of data	Disclosure forms – personnel records
Method of calculation or assessment	Number of staff living with disability divided by the total number staff X 100. Staff means permanent and fixed-term contracts on permanent positions, including contractors - excluding interns
Means of verification	HR report

Assumptions	Measures to attract and retain targeted groups are effective Existing staff willingness to disclose
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: Applicable as per the CGS employment equity
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Achieve or exceed the targeted percentage of employees living with disabilities
Indicator responsibility	Executive Manager: Corporate Services
12. Indicator Title	EE Stats, Scientific cohort (Female representation)
Short definition	The percentage of female scientific staff at the CGS. Scientific staff means any employee at the CGS with a scientific qualification or involved in the scientific programmes (who book time on the timesheet system)
Source / collection of data	VIP system
Method of calculation or assessment	$(\text{Number of female scientific staff} \div \text{total scientific staff}) \times 100$
Means of verification	HR report
Assumptions	Measures to attract and retain targeted groups are effective
Disaggregation of beneficiaries (where applicable)	Target for women: Applicable as per the CGS employment equity plan Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Achieve the targeted percentage of employment equity
Indicator responsibility	Executive Manager: Corporate Services
13. Indicator Title	EE-Stats, Senior Management (Female representation)
Short definition	The percentage of female staff at Senior Management level at the CGS.
Source / collection of data	VIP system
Method of calculation or assessment	$(\text{Number of female staff at Senior Management level} \div \text{total number of Senior Management members}) \times 100$
Means of verification	HR report
Assumptions	CGS supportive of transformative agenda of the government
Disaggregation of beneficiaries (where applicable)	Target for women: Applicable as per the CGS employment equity plan Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Achieve the targeted percentage of employment equity
Indicator responsibility	Executive Manager: Corporate Services
14. Indicator Title	EE Stats, Top Management (Female representation)
Short definition	The percentage of female staff at the Top Management level at the CGS.
Source / collection of data	VIP system
Method of calculation or assessment	$(\text{Number of female staff at the Top Management level} \div \text{total number of Top Management members}) \times 100$
Means of verification	HR report
Assumptions	CGS supportive of transformative agenda of the government
Disaggregation of beneficiaries (where applicable)	Target for women: Applicable as per the CGS employment equity plan Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Achieve the targeted percentage of employment equity
Indicator responsibility	Executive Manager: Corporate Services

15. Indicator Title	Onshore geoscience map coverage
Short definition	Coverage of onshore geoscience maps expressed as a percentage
Source / collection of data	Integrated Geoscience Development and Geoscientific Services (Geoscience Technical Programme)
Method of calculation or assessment	Count the number of onshore geoscience maps produced within the reporting period added to maps produced in preceding years (such as geology, geophysics, geotechnical, geochemistry, seismic hazards, mineral resources, energy resources and hydrogeology) divided by the total number of map tiles (same scale) covering South Africa's onshore territory X100
Means of verification	Assessment of the geoscience maps submitted
Assumptions	Availability of financial and human resources Seamless access to land Favourable health, safety and environmental conditions
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Achieve targeted number of geoscience outputs
Indicator responsibility	Executive Manager: Integrated Geoscience Development
16. Indicator Title	Offshore geoscience map coverage
Short definition	Coverage of offshore geoscience maps expressed a percentage
Source / collection of data	Integrated Geoscience Development and Geoscientific Services (Geoscience Technical Programme)
Method of calculation or assessment	Count the number of offshore geoscience maps produced within the reporting period added to maps produced in preceding years (such as geology and geophysics) divided by the total number of map tiles (same scale) covering South Africa's offshore territory X 100
Means of verification	Assessment of the geoscience maps submitted
Assumptions	Availability of financial and human resources Favourable health, safety and environmental conditions Continuity of strategic partnerships for the offshore programme
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Achieve targeted number of geoscience outputs
Indicator responsibility	Executive Manager: Integrated Geoscience Development
17. Indicator Title	Applied geoscience outputs for minerals and energy
Short definition	Applied geoscience outputs are value-added outputs that have scientific, economic and social benefit (i.e., maps, databases, reports, models, software, methodologies, etc) deliverables, which are responsive to mineral and energy development.
Source / collection of data	Geoscience Technical Programme
Method of calculation or assessment	Count the number of applied geoscience outputs that add value and support minerals and energy development approved by the CEO (such as integrated reports, 3D models, innovative solutions, mineral systems or emplacement models)
Means of verification	Assessment of the outputs that add value and support mineral and energy development
Assumptions	Availability of financial and human resources Seamless access to land Favourable health, safety and environmental conditions Continuity of strategic partnerships for the offshore programme
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Achieve targeted number of geoscience outputs
Indicator responsibility	Executive Manager: Integrated Geoscience Development

18. Indicator Title	Applied geoscience outputs for infrastructure, land use, health, groundwater and the environment
Short definition	Applied geoscience outputs are value-added outputs that have scientific, economic and social benefit (i.e., maps, databases, reports, models, software, methodologies, etc) deliverables, which are responsive to infrastructure, land use, health, groundwater and the environmental prudence.
Source / collection of data	Geoscience Technical Programme
Method of calculation or assessment	Count the number of value-added applied geoscience outputs not related to mineral and energy approved by the CEO (such as integrated reports, 3D models and innovative solutions)
Means of verification	Assessment of the outputs that add value and support infrastructure, land use, health, groundwater and the environmental stewardship
Assumptions	Availability of financial and human resources Seamless access to land Favourable health, safety and environmental conditions Continuity of strategic partnerships for the offshore programme
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	Achieve targeted number of geoscience outputs
Indicator responsibility	Executive Manager: Integrated Geoscience Development

19. Indicator Title	Number of Articles Published on Media Platforms
Short definition	Number of articles with scientific or organisational content (written or contributed by the CGS) published in mainstream media and/or industry publications (such as mining engineering, popular science magazines, newspapers, social media and newsletters)
Source / collection of data	Communication and Stakeholder Relations
Method of calculation or assessment	Count number of media articles
Means of verification	Articles published on media platforms
Assumptions	Availability of financial resources Communication and stakeholder management strategy in place
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	To achieve or exceed target
Indicator responsibility	Manager: Communications & Stakeholder Relations
20. Indicator Title	Stakeholder Satisfaction Level
Short definition	This is the level of satisfaction of stakeholders in active engagement with the CGS
Source / collection of data	Stakeholder survey
Method of calculation or assessment	Percentage of stakeholders satisfied with services and products from CGS
Means of verification	Stakeholder survey report
Assumptions	Willingness of stakeholders to participate in the survey
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually
Desired performance	Achieved set level of stakeholder satisfaction
Indicator responsibility	Manager: Communications & Stakeholder Relations
21. Indicator Title	Number of Peer-Reviewed Articles Published
Short definition	Peer-reviewed articles published in scientific journals, book chapters and edited volumes
Source / collection of data	Integrated Geoscience Development and Geoscientific Services
Method of calculation or assessment	Count the number of peer-reviewed publications
Means of verification	Assessment of the peer-review articles
Assumptions	Continuity of the Geoscience Technical Programme Sustainable strategic and technical collaborations Efficiencies in publication time lines
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	A performance better than the target is desirable
Indicator responsibility	Executive Managers: Integrated Geoscience Development and Geoscientific Services
22. Indicator Title	Number of CGS Publications
Short definition	The publications of CGS information in deliverables/products such as bulletins, memoirs, books and atlases.
Source / collection of data	Integrated Geoscience Development and Geoscientific Services
Method of calculation or assessment	Count the number of CGS publications.
Means of verification	Assessment of the internal publications submitted

Assumptions	Availability of financial resources Sustainable strategic and technical collaborations
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	A performance better than the target is desirable
Indicator responsibility	Executive Managers: Integrated Geoscience Development and Geoscientific Services
23. Indicator Title	Number of papers published in a conference proceedings
Short definition	Total number of papers (such as abstracts, extended abstracts and conference papers and keynotes, etc.) published in conference proceedings
Source / collection of data	Integrated Geoscience Development and Geoscientific Services
Method of calculation or assessment	Count the number of papers published in a conference proceedings
Means of verification	Assessment of the papers published in a conference proceedings
Assumptions	Availability of financial resources Sustainable strategic and technical collaborations Favourable health, safety and environmental conditions
Disaggregation of beneficiaries (where applicable)	Target for women: N/A Target for youth: N/A Target for people with disabilities: N/A
Spatial transformation (where applicable)	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually (tracking and monitoring is done on the quarterly basis)
Desired performance	A performance better than the target is desirable
Indicator responsibility	Executive Managers: Integrated Geoscience Development and Geoscientific Services

ANNEXURES

There are no annexures attached to this document.



Council for Geoscience