



STATEMENT OF CORPORATE INTENT

2010-2011

Statement of Corporate Intent 2010-2011

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Abbreviations

CDEM	Civil Defence and Emergency Management
COMU	Crown Ownership Monitoring Unit, within Treasury
CRI	Crown Research Institute
DoC	Department of Conservation
DSIR	Department of Scientific and Industrial Research (disestablished in 1992)
EEZ	Exclusive Economic Zone
EQC	Earthquake Commission
FRST	Foundation for Research, Science & Technology
HRC	Health Research Council
IAEA	International Atomic Energy Agency
ICDP	International Continental Scientific Drilling Program
IODP	Integrated Ocean Drilling Program
LINZ	Land Information New Zealand
MAF	Ministry of Agriculture and Forestry
MCDEM	Ministry of Civil Defence and Emergency Management
MED	Ministry of Economic Development
MFAT	Ministry of Foreign Affairs and Trade
MfE	Ministry for the Environment
MoRST	Ministry of Research, Science, and Technology
NIWA	National Institute of Water and Atmospheric Research Ltd (a CRI)
NZAID	New Zealand Agency for International Development
OECD	Organisation for Economic Co-operation and Development
PSAF	Pre-Seed Accelerator Fund (administered by FRST)
ROE	Return on equity
RSNZ	Royal Society of New Zealand
TEO	Tertiary Educational Organisation (university, <i>wānanga</i> , polytechnic)
VUW	Victoria University of Wellington

1 Introduction – needs for New Zealand's future

This Statement of Corporate Intent is submitted by the Board of Directors of the Institute of Geological and Nuclear Sciences Limited (GNS Science) pursuant to Section 16 of the Crown Research Institutes Act 1992.

GNS Science is a Crown Research Institute (CRI) wholly owned by the New Zealand Government and was incorporated on 1 July 1992. It is the country's research institute that meets New Zealand's need to discover and understand the earth processes and materials that underpin geological resources, environmental and industrial isotopes, and natural hazards. It applies this knowledge through product development, consultancy, and analytical services to create and preserve wealth, to protect the environment, and to improve the safety and well-being of people. Its largest client is the Foundation for Research, Science and Technology (FRST) which typically provides over 40% of revenue, with a wide range of other government, local body and commercial customers accounting for the remainder.

GNS Science holds the keys to eight important needs for NZ's future:

Energy: New Zealand's current energy resources cannot meet future needs because of declining gas reserves and future climate change (e.g. dry years for hydro-lakes). GNS Science is the national expert underpinning the geothermal industry and its quest for new deep and low-temperature resources. Moreover, the company works with MED to attract investment to NZ for new oil, gas, and gas-hydrate exploration and to limit LNG import costs. The company is also engaged in geotechnical aspects of capturing tidal energy.

Minerals: GNS Science assesses the grades of mineral resources. This is essential for the identification and management of these resources and wealth creation.

Groundwater: GNS Science assesses the quantity and quality of groundwater resources. These resources are becoming more important as demand increases and climate changes.

Climate-change and the environment: GNS Science undertakes research in CO₂ sequestration, climate-change, carbon-dynamics, bioremediation and biodiversity. Our fine-particle air-quality research underpins MfE's *National Environmental Standards for Air Quality* as applied to local government, and informs the Ministry of Transport, the Ministry of Health and HRC with respect to health effects in exposed populations.

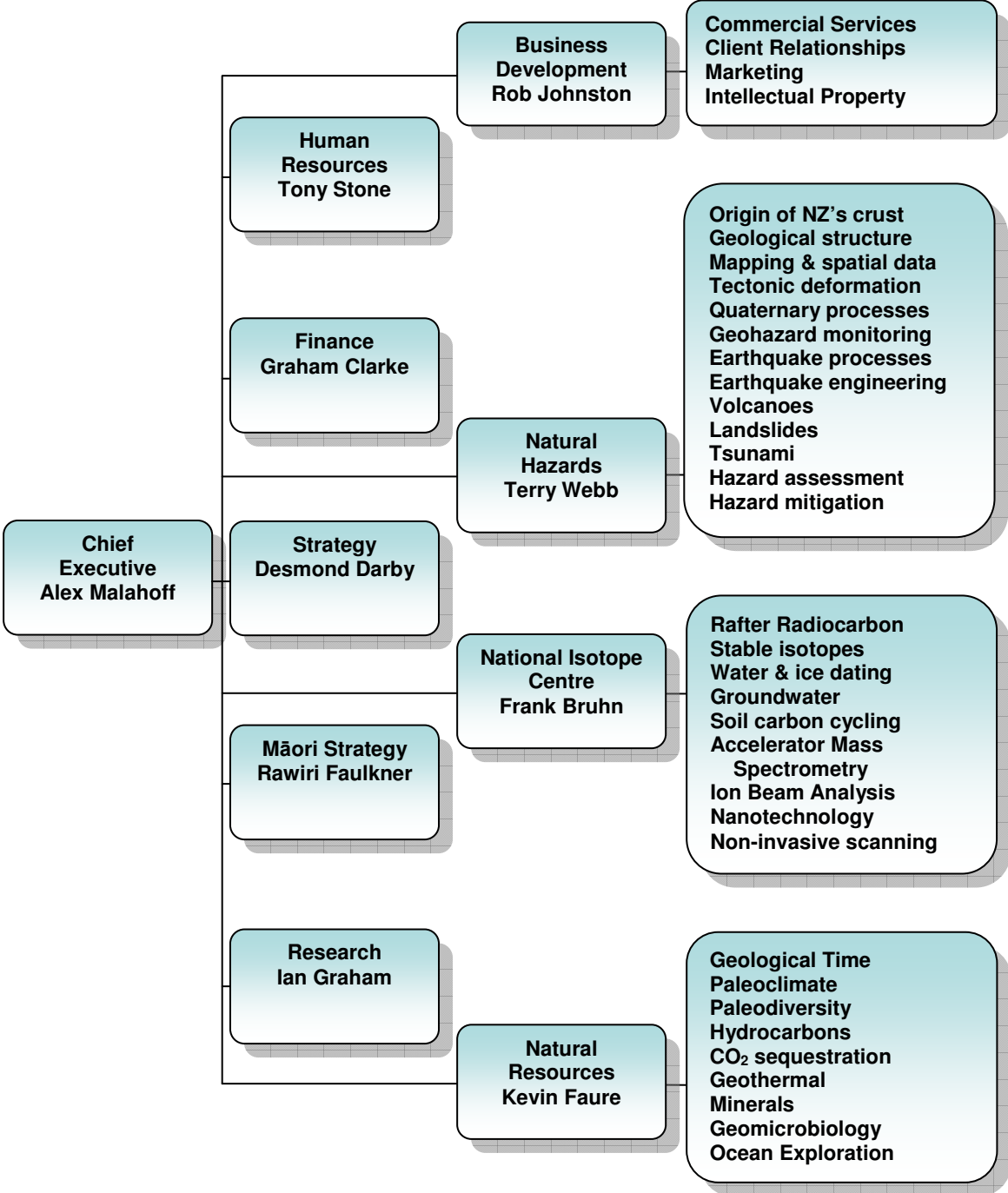
Oceans: NZ has the fourth-largest EEZ and Extended Continental Shelf in the world, but the nature of our vast ocean floor and sub-floor is not well understood, and its energy and mineral resources are not well known. GNS Science has a crucial role in expanding ocean research to explore the 95% of our territory that is submerged.

Natural hazards: The *CDEM Act 2002* and international disasters are changing emergency management in NZ and other countries exposed to earthquakes, volcanoes, tsunami, landslides, and floods. GNS Science leads the natural hazards research platform and are a principal adviser to local and overseas authorities and companies taking an "all-hazards" approach. GNS Science also advises the insurance industry and development agencies.

Commercialisation: Major opportunities are in data products for energy industries, assisting other nations with Extended Continental Shelf claims, geomicrobiology for the biotech sector, nanotechnology for the electronic industry, and non-invasive scanning for the primary sector.

Graduate education: GNS Science has unique facilities (e.g. National Isotope Centre, accelerators, and GeoNet) to support earth- and isotope-science education in universities and *wānanga*. The company recently signed a MoU with VUW to establish a joint graduate research school.

GNS Science's head office is at Avalon, Lower Hutt, where 75% of staff are based, and also has offices at Wairakei (20% of staff) and Dunedin (5% of staff). The Company has a Board of seven Directors and an executive team comprising a Chief Executive, five Corporate Managers, and four Business Group Managers. The organisational business group chart, with principal activities, is shown below.



2 Core Purpose of GNS Science – Te Pū Ao

*Mai i te rangi, ki te nuku o te whenua,
ka puta te ira tangata i te po,
i te whaiao, i te ao mārama.
Ko Te Pū Ao mātou.*

*From the sky and the land came people,
from the night, to the old world,
to the world of light.
We are GNS Science.*

Purpose

The purpose of GNS Science is to meet New Zealand's need to discover and understand the earth processes and materials that underpin geological resources, environmental and industrial isotopes, and natural hazards. We apply this knowledge to create and preserve wealth, to protect the environment, and to improve the safety and well-being of people.

Whakapapa

We were founded in 1865 as the *New Zealand Geological Survey*. In 1992 we merged with the former *DSIR Geophysics Division* and the *Institute of Nuclear Sciences*, as well as parts of *DSIR Physics and Engineering Laboratory* and *DSIR Chemistry Division*, to become the Institute of Geological and Nuclear Sciences Ltd, operating primarily under the Crown Research Institutes Act 1992, the Companies Act 1993, and the Crown Entities Act 2004.

Vision

GNS Science's vision is to be recognised globally as a leading integrator of knowledge of earth systems and materials for societal benefits.

Our distinctive character

The national importance of our purpose arises from the planet Earth being a mass of 6 billion trillion tonnes, held together by gravity and heated internally by radioactivity and externally by solar radiation. Gravity and heat drive plate tectonics and the processes that generate and store the energy, minerals, and water that underpin wealth and life, and create the fertile regions that host human settlement. They also cause the volcanoes, earthquakes, tsunamis, floods and landslides that threaten our economy and population.

As the nation's leading research organisation and advisor to government on earth and isotope science, our role is to develop knowledge of earth processes and materials from the mega- to the nano-scale, to enhance access to the earth's wealth, and to mitigate the geological hazards that destroy it. We have been fulfilling this role for over 145 years.

Values

Our values comprise:

- scientific enquiry and innovation
- excellence generated from globally-sourced expertise and experience
- national and international collaboration to form the best teams
- pursuit of application of science for the benefit of New Zealand

Science areas

In order to fulfil our purpose, the specific areas of our scientific research are:

- Geology (eg: crustal structure, paleontology and stratigraphy, mapping and bedrock geology, sedimentary and petroleum geology, earthquake geology, physical and chemical volcanology, petrology, mineralogy, economic geology, geomorphology, groundwater hydrology, sediment transport, climate history)

- Geophysics (eg: seismic, gravitational and electromagnetic sounding, heat-flow, geodesy, geodynamics, earthquake and volcano seismology, tsunamis, hydrogeology)
- Geochemistry (eg: organic and inorganic analysis and tracing, mineralogy, volcanic hazard monitoring, water and soil chemistry)
- Ocean exploration (eg: marine geology and geophysics of oceanic crust and overlying sediments, submarine volcanoes, hydrothermal vents, extremophiles, marine minerals, determination of Law of the Sea boundaries)
- Isotope science (eg: radiometric dating, stable isotope analysis, accelerator mass spectroscopy, ion beam and radiation technologies)
- Ion-beam technology (eg: accelerator-based nanotechnology, nano-device development)
- Environmental biology (eg: taxonomy, biodiversity, biostratigraphy, geomicrobiology, benthic habitats)
- Time-varying geospatial data analysis, and information management (eg: earthquake, volcano, tsunami and landslide monitoring, GIS mapping, remote sensing, spatial data management, software development, visualisation)
- Mathematical modelling (eg: analytical and numerical methods, wave propagation, optimisation, computer programming including parallel computing)
- Earthquake and geological engineering (eg: material properties, slope instability, microzoning, engineering performance, engineering seismology, risk modelling)
- Social and economic sciences (eg: human behavioural research, land-use planning, warning-response effectiveness, evidence-based policy input, natural hazard risk assessment, cost-benefit analyses)
- Novel, cross-disciplinary and integrative research to meet needs arising from new discoveries and technologies in the field of the earth, isotope, and nuclear sciences

National facilities

We host and maintain national research facilities for the benefit of New Zealand:

- GeoNet to monitor earthquakes, volcanoes, tsunamis, landslides & tectonic deformation
- National Isotope Centre to facilitate environmental, climate, and materials research
- the national paleontology, petrology and minerals collections
- the national geological and geophysical maps and databases
- the national groundwater monitoring programme and database

Result areas – sectors and benefits

The sectors to which we transfer our knowledge and that therefore benefit from the results of our work are those involved with wealth and infrastructure creation and protection, including:

- Energy generators (eg: assessment of oil, gas and geothermal resources, and carbon geo-storage options for industrial users)

- Mineral explorers (eg: terrestrial and marine resource assessment)
- Infrastructure owners (eg: geo-engineering of hydro and other energy facilities, transport and other major structures; hazard and risk assessment and mitigation)
- Insurers and re-insurers (eg: natural hazards and risk assessment)
- Civil defence and emergency managers (eg: earthquake, volcano, landslide, tsunami response advice)
- Iwi/Māori (eg: Iwi/Māori resilience and economic development for the benefit of all New Zealanders)
- Biotechnology industry (eg: discovery and characterisation of extremophile micro-organisms)
- Land owners (eg: advice on urban and rural land-use planning)
- Primary produce processors (eg: isotope tracing and non-invasive scanning)
- Materials processors (eg: ion-beam treatment and nano-device development)
- Geologists, archaeologists and antiquarians (eg: isotopic dating and tracing)
- Local and regional government (eg: monitoring and advice on risk from natural hazards, public education and preparedness, groundwater, air particulates, urban and rural land-use planning, and geological resource management, greenhouse gas accounting, climate change adaptation and mitigation)
- Central government (eg: advice on oil, gas and mineral resources, hazards, climate-change, and nuclear applications and risk; underpinning cadastral survey system; supporting international diplomacy)
- Aid agencies (eg: advice on hazards, groundwater, and land-use planning)
- Universities (eg: teaching and postgraduate student supervision)

Criteria for success

We assess our success against the criteria specified in the CRI Act that requires us to

- undertake (scientific) research for the benefit of New Zealand
- pursue excellence in all our activities
- comply with any applicable ethical standards
- promote and facilitate the application of the results of research and technological developments
- be a good employer
- to exhibit a sense of social responsibility
- to operate in a financially responsible manner so as to maintain our financial viability.

In our Annual Report we also satisfy our obligations under the Public Finance Act 1989, the Companies Act 1993, and the Crown Entities Act 2004. In addition, we report other characteristics of the company, such as collaborative activity, staff numbers and international relationships, and provide narratives of our principal achievements each year.

3 Key Strategic Issues for the Company

Key Stakeholders

The strategic relationships essential for GNS Science to achieve its purpose are those with:

- Crown shareholders and other Crown Ministers
- Public-good research funding agencies
- New Zealand and overseas commercial clients
- *Iwi*
- Employees

These five key groups also embody relationships with other stakeholders, such as the universities, overseas research partners, and the New Zealand public.

Key Strategic Issues

Analysis of the needs of these stakeholders and of the issues facing New Zealand yields five Key Strategic Issues for GNS Science.

(1) Culture – GNS Science must maintain a vibrant research culture in an environment where consultancy revenue increases faster than research funding.

The company's total revenue has increased by 118% over the past ten years. The non-Crown component, mainly from consultancy, increased by 319% (averaging 15% per year), but the Crown component increased by only 46% (4% per year). Consequently, public good research revenue is now less than other revenue, reflecting the Crown's minimal increase in research, science and technology investment in either real terms or in relation to GDP.

While diverse components of revenue provide resilience to instabilities in each component, the culture of consulting ("scope confined, on time, on budget") differs from that of research ("publish when new knowledge is gained or the problem is solved"). The CRI Taskforce has also reported on the importance of CRIs having "work programmes that allow scientific endeavour and excellence to flourish and be properly recognized" ¹.

(2) Role – GNS Science must pursue opportunities with Crown agencies that should open through the implementation of the CRI Taskforce recommendations.

The CRI Taskforce has highlighted the desirability of Crown agencies purchasing our services at fair prices and on a long-term basis ². This recommendation addresses a long-standing issue affecting the company's relationships with some of these agencies. In return, the company needs to pursue such opportunities that this recommendation may open.

(3) Capabilities – GNS Science must maintain and enhance its world-class capabilities.

GNS Science has world-leading and nationally important capabilities in all of the hazards, resources and isotopes areas, and it is important that the company maintains and enhances them, even when circumstances such as staff retirements, global skill-shortages, and limited funding make this challenging. Past use of CRI Capability Funding, and work with MoRST to initiate Backbone Funding for databases, has created sufficient confidence for these funds to be advanced as part the CRI Core Purpose Funding proposed by the CRI Taskforce ³.

¹ Report of the Crown Research Institute Taskforce, 2010, paragraph 5.11, p38

² Report of the Crown Research Institute Taskforce, 2010, Recommendation 10

³ Report of the Crown Research Institute Taskforce, 2010, Recommendation 5

(4) Investment – GNS Science must seize new opportunities for investment in research and commercial applications

Successive years of operational surpluses, and the eventual proceeds from the sale of the Bell Road property, provide the company with the ability to explore new initiatives, both for the advancement of science and for future financial growth.

(5) Productivity – GNS Science must improve its productivity to ensure continued financial viability as the national and global economies recover

Although the company's financial viability is not strongly dependent on unstable capital markets, its profitability is strongly dependent upon the effective use of staff time, charged at competitive rates. To ensure ongoing financial viability, the company must therefore make every effort to preserve its revenue streams and to improve the productivity of its staff.

4 Proprietorship ratio

This ratio is defined as shareholders' equity in the group at balance date divided by total assets employed in the group as at the balance date.

For year ending 30 June	2010 Forecast	2011 Budget	2012 Outlook	2013 Outlook
Proprietorship ratio	48.3%	50.4%	57.5%	59.7%

5 Accounting policies

GNS Science operates to generally accepted accounting practice and complies with the relevant provisions in the Financial Reporting Act 1993. A statement of accounting policies is set out in Appendix A.

6 Dividend policy

GNS Science's policy is that all funds surplus to the Company's investment and operating requirements, as determined by the principles outlined below, will be distributed to the shareholders.

Principles adopted for determining annual dividend

In determining surplus funds consideration will be given to:

- providing for capital investment requirements (including equity investments) without recourse to the Crown for equity injections to the Company
- opportunities for internal development expenditure
- the Company's working-capital requirements (including subsidiaries and businesses in which equity is held)
- the short, medium, and long-term financial viability of the Company, including its ability to repay debt
- the obligations of the directors under the Companies Act 1993 and other statutory requirements.

The Board will detail in a submission to shareholding Ministers, within two months of the end of each financial year:

- the amount of dividend (if any) recommended to be distributed to the shareholders
- the percentage of tax-paid profits that the dividend represents
- the rationale and analysis used to determine the amount of dividend.

7 Other business policies

GNS Science aims to remain a high-quality, financially viable research institute operating in accordance with the principles stated in the CRI Act.

Expansion, diversification, mergers, acquisitions and divestment policies

GNS Science will strive to add value to its activities and net worth. It will ensure that all new investments and expansions of core business, and diversification away from core business, will ordinarily provide shareholders with additional economic value, allowing for the risks involved, within the maximum of 10 years or the lifetime of the investment. All material, planned expansions, diversification and divestments will be discussed with the shareholders beforehand.

Acquisitions or mergers will only be undertaken where the Board is satisfied that scientific, technological and economic benefits will result, and with the prior agreement of the shareholders.

GNS Science will give notice to the shareholding Minister prior to establishing any subsidiary or joint venture, and the level of representation on the board of a subsidiary or joint venture will reflect the level of investment by the company. Employees may be appointed to these boards.

Shareholder consent for significant transactions

The Board will obtain prior written consent for any transaction or series of transactions involving full or partial acquisition, disposal or modification of property (buildings, land and capital equipment) and other assets with a value equivalent to or greater than \$10 million or 20% of the company's total assets (prior to the transaction), whichever is the lesser.

The Board will obtain prior written consent of shareholding Ministers for any transaction or series of transactions with a value equivalent to or greater than \$5 million or 30% of a company's total assets (prior to the transaction) involving:

- acquisition, disposal or modification of an interest in a joint venture or partnership, or similar association
- acquisition or disposal, in full or in part, of shares or interests in a subsidiary, external company or business unit
- transactions that affect a company's ownership of a subsidiary or a subsidiary's ownership of another entity
- other transactions that fall outside the scope of the definition of the company's core business or that may have a material effect on the company's science capabilities.

Investments in Capital Assets

GNS Science will invest in capital equipment and facilities that will enhance its capability to develop its core business and provide an appropriate rate of return on the investment. Return on investment will be monitored against the plan to provide an enhanced basis for future investment decisions.

CRI Capability Funding

GNS Science will use its CRI Capability Funding allocations for developing its organisational capability, including sustaining and enhancing its key capabilities, and discovering and exploring promising new developments in those areas.

Databases and Collections

The Company has developed detailed policies on data and information ownership, access and pricing.

GNS Science will comply with all relevant legislation and regulation pertaining to ownership, access and pricing of data and information. It will own and intellectually protect as much copyrighted data and information as possible.

GNS Science will not dispose of any Nationally Significant Database or Collection (set out in Appendix B) without the prior permission of the Shareholders. It will not dispose of any other database or collection it considers to be of national significance without first discussing this with the Shareholders. Regard will be held to the CRI Act and the Public Records Act when disposing of any database or collection.

GNS Science will provide full access to data and information that has been funded by the New Zealand public, unless this is not to New Zealand's benefit. Reasons for restricting access may include the potential loss of valuable intellectual property to other nations, public control when facing impending geological disaster, or management over newly-discovered and valuable mineral resources. GNS Science will also provide chosen access to data and information funded out of its own resources, in compliance with the obligations of the Commerce Act, the Official Information Act and the CRI Act. The Company will charge an appropriate access fee for the data and information it owns. The Company may price data and information, depending upon the funding source and the nature of the end use.

GNS Science will advise Shareholders of any dispute regarding the terms of access and use of any Nationally Significant Database or Collection. The Company will make all reasonable attempts to settle the dispute with the disputing party. GNS Science will refer the matter to Shareholders in the absence of any agreement within 30 days of notification of a dispute. Any decision by the Shareholders will be binding on the Company.

Treatment of items with covenants

GNS Science owns property, which has caveat obligations under section 40(2) of the Public Works Act 1981, covenants on the disposal of nationally significant databases and reference collections, and certificates of easements obligations. These will be managed in accordance with statutory requirements and obligations under the Transfer Agreement with the Crown.

Cash management policy

GNS Science will manage cash prudently. Surplus cash is invested with registered banks.

8 Other matters

International agreements

The co-operation agreements and arrangements that GNS Science has with international organisations are set out in Appendix C. The Company will inform shareholding Ministers in writing well in advance should it plan to dissolve any formal international agreement for which it has responsibility.

Statutory function to be undertaken

GNS Science recognises its statutory obligations under the CRI Act, and other Acts applying to the Company, including its obligations under the Public Finance Act 1989, the Crown Minerals Act 1991, the Companies Act 1993, and the Crown Entities Act 2004. The Company has policies and procedures in place to ensure its statutory obligations are met.

9 Performance measures and targets

Financial Performance Measures and Targets

Financial overview

Year ending 30 June	2010 forecast	2011 budget	2012 outlook	2013 outlook
Total Revenue (\$million)	65.2	67.9	70.1	73.4
ROE before development expenses	9.6%	9.5%	12.9% ¹	9.6%
Return on Equity (ROE)	8.9%	9.0%	12.5% ¹	9.2%
Proprietorship Ratio ²	48.3%	50.4%	57.5%	59.7%
Gearing ³	26.1%	25.1%	13.4%	13.8%
Interest Cover ⁴	12	8	7	13

¹ Subject to sale of Bell Road property

² Shareholders equity at balance date divided by total assets at balance date

³ Financial debt divided by the sum of financial debt plus shareholders' equity

⁴ Earnings before interest and tax, divided by financing costs

Productivity measures

Year ending 30 June	2010 forecast	2011 budget	2012 outlook	2013 outlook
Revenue Per FTE (\$000)	180	183	186	189
Capital investment (\$000)	8,700 ¹	5,400	5,500	7,000

¹ includes the purchase of a replacement accelerator at \$3.35M

Research revenue

Year ending 30 June	2010 forecast	2011 budget	2012 outlook	2013 outlook
Revenue from:				
FRST (\$000)	27,882	28,500	28,928	29,651
Capability funding (\$000)	5,316	5,549	5,550	5,550
PSAF (\$000)	266	266	266	325
Marsden (\$000)	1,324	1,673	1,700	1,794
GeoNet (\$000)	8,770	8,932	9,000	9,225

Consultancy, service and product revenue

Year ending 30 June	2010 forecast	2011 budget	2012 outlook	2013 outlook
Revenue from commercial activities				
New Zealand (\$000)	14,311	15,550	16,709	18,314
Overseas (\$000)	7,196	7,350	7,901	8,494

Non-Financial Performance Measures and Targets

Human resources

Year ending 30 June	2010 forecast	2011 budget	2012 outlook	2013 outlook
Full-time equivalents (FTEs)	363	371	378	388
Researchers	263	268	273	281
Research support	45	46	47	48
General support & management	55	57	58	59
Average salary increase	3-5%	3-5%	3-5%	3-5%
Training & conferences (\$000)	920	1,030	1,040	1,051
Work days missed due to injury	< 10	< 10	< 9	< 8
ACC workplace safety accreditation	secondary	secondary	tertiary	tertiary

Research indicators

Year ending 30 June	2010 forecast	2011 budget	2012 outlook	2013 outlook
Peer-reviewed scientific papers	230	230	240	250
Research monographs & maps	3	3	3	3
Other journal papers	50	60	60	70
Keynote and plenary presentations	10	10	10	10
New Marsden projects	3	3-5	3-5	3-5
Graduate scholarships funded	18	18	20	20
Graduate students supervised	101	90	100	110
Contracts from TEOs (\$000)	1,400	1,400	1,500	1,500
Contracts to TEOs (\$000)	3,200	3,300	3,400	3,500
Projects involving Māori	10	12	14	16

Research application indicators

Year ending 30 June	2010 forecast	2011 budget	2012 outlook	2013 outlook
Commissioned reports to users	300	300	300	300
Presentations to users	15	15	15	15
User-sector/industry articles	12	12	12	12
New & improved products/processes/services	12	12	12	12
Joint ventures / formal associations	3	3	4	5
Patents granted – in New Zealand	1	1	1	1
– overseas	1	1	1	1
Licensing agreements entered into	24	26	28	30
International fora representing NZ	15	15	15	15

10 CRI Capability Fund investment

Our Agreement with the Minister of Research, Science and Technology in relation to our allocation of CRI Capability Funding requires us to state how we will use the funding over the next one to three years to strengthen our capabilities.

In general terms, there are three categories in which Capability Funding is used: (a) to maintain existing capabilities, (b) to enhance existing capabilities, and (c) to explore and develop over-the-horizon possibilities. The term “capability” is used to mean a specific combination of people, skills, infrastructure, relationships, and culture.

We present here our plan for use of this funding for 2010/11 under five broad, and sometimes overlapping, areas:

- 1) underpinning and basic science
- 2) technology transfer
- 3) natural hazards
- 4) geological resources
- 5) environmental research

1. Underpinning and basic science

Economics

Purpose: to enhance existing capabilities to build data/model infrastructure supporting the quantitative interface between science and economics, initially focused on the critical trade-off between agricultural production and water use (recharge, runoff, irrigation) under changing climate; and to develop a new capability in economics research for water resource management, climate change, and hazard impacts, translating geoscience knowledge into financial measures more readily used by decision makers.

Stakeholder needs considered: Local government, MfE, CDEM Groups, commercial earthquake insurers, climate-change and water research providers: other CRIs, MfE, MAF; local government, agricultural industry, public.

3D Geology Mapping

Purpose: to develop new capability in capturing, managing and making accessible subsurface geological knowledge through 3D geology mapping; to explore merits of integrating stand-alone drill-hole databases for efficient management of petroleum, groundwater, coal, minerals and geotechnical data held by GNS Science and others.

Stakeholder needs considered: groundwater, minerals, geothermal and hydrocarbons exploration carbon capture and storage industries, and geotechnical and urban geology; MED; local government; universities.

Remotely Sensed Imagery

Purpose: to enhance existing skills in image data analysis, including testing applications and storing both raw data and analysed product; to explore merits of new techniques by partnering with other agencies; explore merits of locating a space-agency download ground-station in NZ.

Stakeholder needs considered: EQC, MCDEM, local government, large utility and asset owners, RiskScape, FRST, NZDF, public.

International Scientific Drilling

Purpose: to develop new capabilities in use of scientific drilling through participation in international scientific drilling partnerships.

Stakeholder needs considered: Crown Ministries, FRST, RSNZ, universities and other CRIs, overseas research organisations, commercial clients.

Crustal Modelling

Purpose: to enhance capability to model and thereby gain better understanding of the forces, stresses and strains developed in the crust as a result of events such as earthquakes and volcanoes for a range of rheological conditions.

Stakeholder needs considered; other FRST-funded research; MED, public.

National Isotope Centre facility

Purpose: to maintain and enhance capability in radiocarbon analysis for dating and C cycle studies; to enhance capability in applying high quality and cost effective cosmogenic and stable isotope data for environmental, hazards, industrial and food applications.

Stakeholder needs considered : FRST, CRI and university collaborators, national and international users, local government.

Databases

Purpose: to maintain capability by supporting modernisation of key databases.

Stakeholder needs considered; internal and external users for pure and applied science

2. Technology transfer

Intelligent Measurement Systems for Industry

Purpose: to maintain at-risk capabilities to generate intelligent industrial non-invasive measurement-systems; to enhance capability in ion beam analysis, nanotechnology, and air particulates.

Stakeholder needs considered: primary industries (meat, horticulture, timber, wool), universities, local government.

Pre-Seed Portfolio Supplement

Purpose: to enhance existing capability in developing various projects from knowledge-based to investor-ready state in conjunction with FRST-funded PSAF.

Stakeholder needs considered: industry partners, FRST, local government.

Māori Research

Purpose: to maintain and enhance existing capability of staff to understand the benefits of, and to identify opportunities for, integrating Māori interests with our activities.

Stakeholder needs considered: our own staff, *iwi*, *hapū*, *rūnanga*, trusts and Māori-owned businesses.

Outreach

Purpose: to enhance capability for improving public awareness of the benefits of our public-good science, including enhanced website management and greater participation of staff in outreach; to explore merits of a new capability of establishing a video library to complement the photo library.

Stakeholder needs considered: MoRST, science teachers and students, public.

3. Natural Hazards

Volcanology

Purpose: to enhance existing capability in (a) forecasting future volcanic activity, (b) responding to a volcanic crisis in a timely fashion, and (c) supporting other research initiatives; to explore new capability for risk assessment of volcanic-cone collapse.

Stakeholder needs considered: EQC, MCDEM, local government, large utility & asset owners, FRST, public.

Geotechnical Research

Purpose: to enhance existing research capability in engineering geology and geotechnical engineering; to develop a landslide database.

Stakeholder needs considered: EQC, MCDEM, local government, lifelines, utility operators, emergency responders, insurance sector, universities.

Tsunami Modelling

Purpose: to maintain capability in tsunami-data acquisition and to enhance capacity to undertake tsunami-propagation and -inundation research.

Stakeholder needs considered: MCDEM, MfE, EQC, public.

Time-Varying Hazard and Risk

Purpose: to maintain at-risk capability in time-varying earthquake hazard and risk and to rigorously measure the performance of new and existing earthquake forecasting models; to enhance research capacity in statistical seismology and the link to understanding the physical processes of earthquake generation; these components will enhance our ability to improve upon existing short-term, medium-term and long-term forecasting models.

Stakeholder needs considered: FRST, EQC, insurance sector, MCDEM, major infrastructure owners, Standards New Zealand.

Disaster Risk Reduction

Purpose: to enhance our regional international participation in seismic hazard and risk assessment, tsunami modelling, and volcano research and monitoring, by participation in the Global Earth Model project and in mutually beneficial projects with the Earth Observatory of Singapore.

Stakeholder needs considered: developing countries in the SW Pacific and SE Asia, New Zealand government (e.g. NZAID), other CRIs, industry partner.

4. Geological resources

Marine Energy

Purpose: to explore new capabilities in tapping into NZ's marine energy and to establish a team with this focus.

Stakeholder needs considered: EECA (Marine Deployment Fund), Grow Wellington (Wellington City and Regional Councils), electricity generators, other CRIs, European Marine Energy Centre, Renewable Energy Fund.

Airborne Geophysics

Purpose: to develop new capabilities in aeromagnetic inversion for 3D interpretation of structure, mineralisation and geothermal activity, and to enhance capability in land-based geophysical data interpretation; these components will improve our ability to understand the 3D structure of the earth, mineral-deposition processes, and geothermal and volcanic activity.

Stakeholder needs considered: NZ and overseas research partners; FRST; minerals industry; geothermal industry; local government.

Seabed and Subsurface Mapping and Resource Characterisation

Purpose: to enhance existing capabilities for resource assessment, sub-sea mapping and seabed characterisation.

Stakeholder needs considered: MED, OS2020 agencies (LINZ, MfE, DoC, MFish, MFAT, NZDF), other CRIs, overseas research partners, hydrocarbons industry.

Marine Geochemistry

Purpose: to enhance capability in vent-fluid and plume-sample analysis, in order to improve our understanding of offshore (hydrothermal) mineral-deposition processes.

Stakeholder needs considered: OS2020 agencies (LINZ, MfE, DoC, MFish, MFAT, NZDF), NZ and overseas research partners, minerals industry.

Interpretation of Subsurface Geophysics and Geology

Purpose: to enhance staff skills in their use of seismic interpretation techniques, image-log analysis, and reservoir modelling; to develop a new capability for tracking global methane emissions through time, and related impact on climate change.

Stakeholder needs considered: petroleum companies, geothermal companies, CCS stake holders (CO2CRC and FRST's CCS Steering Group).

Geothermal Sector Research Skills

Purpose: to enhance existing capability in visualisation of large-scale thermal infra-red data for higher resolution ground-surface temperature measurement.

Stakeholder needs considered: local government; energy companies; MED, FRST.

Gas-Hydrates Characterisation

Purpose: to enhance capability for determining the concentration of gas hydrate in the NZ context.

Stakeholder needs considered: MED, other CRIs, New Zealand Centre for Advanced Engineering, overseas research partners, petroleum industry.

Geomicrobiology

Purpose: to maintain at-risk capability in geomicrobiology and building the extremophile collection; to enhance extremophile research in the domains of bio-remediation, industrial and research enzymes, and biofuels.

Stakeholder needs considered: biotechnology industry; university partners; landowners.

Bioproxies: Proxies for Determining Biological and Environmental Changes

Purpose: (a) to enhance methodologies for forensic palynology; (b) to enhance capability to determine accurate paleodepths of Cretaceous and early Cenozoic source rocks.

Stakeholder needs considered: MED, FRST, RSNZ, universities, other CRIs, commercial clients.

5. Environmental research

Groundwater

Purpose: to maintain at-risk capabilities in groundwater age-dating, groundwater resource-assessment, and characterisation of groundwater-surface water interactions.

Stakeholder needs considered: central government, local government, other research organisations.

Predicting Climate Change

Purpose: to maintain at-risk capability of high-precision dating for studies of late Quaternary lake sediments; to enhance existing capability in: transferring knowledge to stakeholders of research findings on climate change; quantitative characterisation of glacial landform change to provide data constraints for numerical glacial modelling of past climate states; integrated stratigraphic studies of lake sediments through recovery of several short sediment cores from lakes for a paleoclimate pilot-study; to enhance existing capability in ice-core analysis; to explore the feasibility of new capabilities of using former glacier snowline elevations as a quantitative measure of past climate histories and dynamics from landform maps; of measuring past lake temperature using lipids preserved in sediment cores; and of using ^{32}Si as a new tool for high resolution climate studies in ocean archives.

Stakeholder needs considered: MfE, FRST, RSNZ, universities, other CRIs, Antarctic NZ, overseas partners (University of Maine, Lamont-Doherty Earth Observatory).

Carbon Capture and Storage

Purpose: to maintain at-risk capabilities by supporting our carbon capture and storage (CCS) work with CO2CRC in both site identification and risk assessment; to develop new capability in applying social science to developing CO₂ sequestration in NZ.

Stakeholder needs considered: NZ government (esp. MED, CCS regulatory group); NZ emitters of CO₂; CO2CRC research consortium (Australia), New Zealand Climate Change Centre (NZCCC), VUW, CSIRO, FRST, public.

11 Information to be reported

Half-yearly report

The half-yearly report will be delivered to shareholding Ministers within two months after the end of the first half of each financial year and will include:

- a commentary on performance for the period;
- a description of scientific and technological highlights for the period;
- unaudited income statement, balance sheet, statement of cash flows, and notes to accounts (including accounting policies); and
- certification by the Board that the Company has operated in accordance with the Crown Research Institutes Act 1992 and Companies Act 1993 during the period.

Annual Report

The annual report will be delivered to shareholders within three months of the end of each financial year. It will report on the operations of the consolidated company and, separately, its subsidiaries (if any) during the financial year. It will comply with the reporting provisions of the Public Finance Act 1989, the Companies Act 1993, the Crown Research Institutes Act 1992, and the Crown Entities Act 2004.

The report will include:

- performance against targets in the SCI for the year, and the comparative performance figures against respective SCI targets for the previous year; this will include reporting on the non-financial Research Application Indicators, as listed above in Section 9;
- a commentary on performance for the period;
- an account of deployment of CRI Capability Funds;
- a description of scientific and technological highlights for the period;
- a description of other highlights for the period;
- audited income statement, balance sheet, statement of cash flows, and accounting policies together with notes to the accounts;
- the auditor's report on the financial statements;
- a management statement to accompany the financial statements; and
- certification by the Board that the Company has operated in accordance with the Crown Research Institutes Act 1992 and Companies Act 1993 during the year.

Strategic Plan and Quarterly Reports

GNS will provide shareholding Ministers with a strategic plan prior to the start of each financial year.

The quarterly reports will report financial performance for the quarter and year-to-date against budgets in the strategic plan, provide updated year-end forecasts and provide a commentary on performance for the period. The commentary will focus on material variances and how these are being addressed. The reports will also comment on major achievements for the period (scientific and operational) and the outlook for the next period. The first quarterly report each year will also include Research Application Indicator reporting on GNS Science's influencing role, and evidence of impact within its areas of operation. Quarterly reports will continue to be submitted so long as they continue to be required by the shareholders

Other information

GNS Science will supply any other information required by the shareholders, pursuant to Section 20 of the Crown Research Institutes Act 1992.

12 Value of the Crown's investment in the Company

The forecast levels of shareholders' equity and proposed dividends are:

Year ending 30 June	2010 forecast	2011 budget	2012 outlook	2013 outlook
Equity (\$000)	22,049	23,876	26,466	28,739
Dividends (\$000)	225	240	550	275

The Board of Directors will conduct a review of the commercial value of the Company whenever it considers there to be a material change in the Crown's investment. The Board undertakes to fully consult with the shareholders at all stages of the valuation process and to provide shareholders with copies of all relevant reports.

No valuation exercise has been undertaken since formation of the Company on 1 July 1992.

13 Compensation

Where the Government wishes GNS Science to undertake activities or assume obligations which will result in a reduction of its profit or net worth, the Board will seek compensation sufficient to allow the Company's position to be restored.

No compensation is currently being sought from the Crown.


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Con Anastasiou
Chairman

Date: 29 June 2010


.....
Ross Butler
Deputy Chair

Date: 28 June 2010

APPENDIX A

STATEMENT OF ACCOUNTING POLICIES

The Institute of Geological and Nuclear Sciences Limited is established under the Crown Research Institutes Act 1992 and the Companies Act 1993. Its subsidiary companies, Isoscan Limited, Isoscan Food Limited, Geological Surveys (NZ) Limited, GNS Science International Limited and Geological Risk Limited are established under the Companies Act 1993.

The principal activity of the Company is to undertake geoscience and isotope science research, development and consultancy, predominantly in New Zealand.

Consolidated financial statements are prepared in accordance with section 17 of the Crown Research Institutes Act 1992, the Public Finance Act 1989, the Companies Act 1993, the Crown Entities Act 2004 and generally accepted accounting practice in New Zealand.

The detailed accounting policies for the Company and Group are set out in the GNS Science Annual Report for the year ended 30 June 2009.

No significant changes in accounting policies are envisaged between the policies outlined in the Annual Report and the budget and forecast information included in this document.

APPENDIX B

NATIONALLY SIGNIFICANT DATABASES AND COLLECTIONS

- 1 Regional Geological Map Archive and Data File
- 2 New Zealand Fossil Record File (with Geological Society of NZ)
- 3 New Zealand Paleontological Database and Collection
- 4 National Petrology Reference Collection and PET Database
- 5 New Zealand Geomagnetic Database
- 6 National Earthquake Information Database
- 7 New Zealand Volcano Database
- 8 National Groundwater Monitoring Programme

APPENDIX C

INTERNATIONAL LINKAGES

The Company officially represents New Zealand on the following international bodies to ensure New Zealand input to planning groups and the development of international standards. In some cases, membership is in part financially supported by government agencies (e.g. MFAT, MED).

- Australia New Zealand Minerals and Energy Council Chief Government Geologists Conference (ANZMEC CGGC)
- Australian Institute of Nuclear Science and Engineering (AINSE)
- International Atomic Energy Agency Regional Co-operative Agreement (IAEA RCA)
- Incorporated Research Institutions In Seismology (IRIS)
- International Energy Association (IEA) Geothermal Experts Group
- OECD International Energy Agency Geothermal Annex (GNS Science holds Secretariat)
- United Nations Comprehensive Test Ban Treaty Working Group
- International Consultative Group on Food Irradiation.

The Company has formal Memoranda of Understanding with the following overseas institutions:

- Chilean National Commission for Scientific and Technological Research (CONICYT)
- China Geological Survey (CGS)
- State Seismological Bureau, China (SSB)
- China Earthquake Administration
- Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences
- Geological Survey of Japan (GSJ)
- Geoscience Australia
- Hebei Bureau of Prospecting and Development of Geology (China)
- Institute of Geology and Institute of Mineral Resources (China)
- Instituto del Mar del Peru (IMARPE)
- International Atomic Energy Agency
- Japan Marine Science & Technology Centre (JAMSTEC)
- Japanese National Institute of Advanced Industrial Science and Technology (AIST)

- Jeonnam Regional Environmental Technology Development Centre (JETeC, South Korea)
- Korean Institute of Geology, Mining, and Minerals (KIGAM)
- Korean National University
- Ministry of Geology and Mineral Resources, China (MGMR)
- Nankai University (China)
- New Energy and Technology Development Organisation, Japan (NEDO)
- Ocean Technology Foundation (USA)
- Oxford University (UK)
- Seoul National University (Korea)
- United States Geological Survey (USA)
- University of Hawaii (USA)
- University of La Reunion (France)

These MOUs and agreements can provide for the exchange of staff between institutions on collaborative programmes as well as partial funding for new research initiatives in some cases.

In addition, the Company is a Member of or represents New Zealand on unions and associations of the International Council of Scientific Unions (ICSU), and other international scientific committees, specifically:

- International Union of Geological Sciences (IUGA)
- International Union of Geodesy and Geophysics (IUGG)
- International Geological Congress (IGC)
- International Association of Seismology and Physics of the Earth's Interior (IASPEI)
- International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)
- Scientific Committee on Antarctic Research (SCAR)
- Southern California Earthquake Center (SCEC)
- National Association of Geochemistry and Cosmochemistry
- Australian Institute of Nuclear Science and Engineering (AINSE)
- International Atomic Energy Agency (IAEA)

23 June 2010