

December 6th 2013

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# Four Year Rolling Review: GNS Science 2013

*Report from the Review panel*



# Four Year Rolling Review: GNS Science 2013

1. FOREWORD.....	3
2. EXECUTIVE SUMMARY.....	4
3. BACKGROUND .....	6
3.1. Context for the rolling reviews .....	6
3.2. Purpose of the review and this report .....	6
3.3. Scope of the review .....	6
3.4. The review panel and processes .....	7
4. HOW WELL IS GNS SCIENCE DELIVERING NOW AGAINST ITS SCP? .....	8
4.1. Context for assessment.....	8
4.2. Purpose .....	8
4.3. Outcomes .....	9
4.4. Scope .....	9
4.5. Operating principles .....	10
5. KEY ISSUES THAT INFLUENCE THE ABILITY OF GNS SCIENCE TO DELIVER TO THE SCP IN FUTURE .....	13
5.1. Leadership and direction.....	13
5.1.1. Determining direction.....	13
5.1.2. An effective governance culture.....	14
5.1.3. Holding to account.....	15
5.1.4. Compliance.....	17
5.1.5. Footnote.....	17
5.2. Financial viability and sustainability .....	19
5.3. Commercial revenue strategy .....	24
5.4. Working with Māori .....	26

5.5. External relationships .....	26
5.6. Culture and people development .....	28
5.7. Other issues.....	30
5.7.1. Core-funding allocation .....	30
5.7.2. Impact assessment .....	31
5.7.3. Natural Hazards Research Platform .....	32
5.7.4. Open data .....	32
6. OPPORTUNITIES AND BARRIERS.....	34
7. CONCLUSIONS.....	36
ANNEXES .....	37
Annex 1: SCP for GNS Science.....	37
Annex 2: Brief biographies of the members of the review panel.....	39
Annex 3: List of information provided to the panel.....	41
Annex 4: Stakeholders whom the panel met with or spoke to .....	46

# 1. FOREWORD

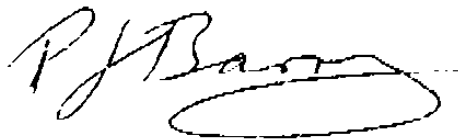
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The 4 Yearly Rolling Review panel would like to record its appreciation to the Board, management and all we met with from GNS Science for the assistance they provided during the review process.

The support provided to the panel by MBIE, especially in sourcing additional information at short notice, was also very much appreciated.

Having rolling four year reviews of the CRIs is a useful initiative in focusing attention on the longer-term performance and capacity of these Crown-owned companies. With a new CEO having joined GNS Science recently, this review is particularly timely. We hope this report will be of assistance to the new CEO as he meets the challenges and opportunities in his new job.

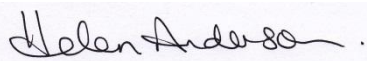
More generally, we hope that this report will assist GNS Science to continue to flourish over the next four years and that the report provides appropriate support for the Ministry and Government in its decision making.



Philip Barry (Chair)

and

Helen Anderson



Allan Freeth



Tricia Harris



(Panel Members)

6<sup>th</sup> DECEMBER 2013

## 2. EXECUTIVE SUMMARY

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Cabinet has agreed [CAB Min (10)43/5C refers] to evaluate the performance of each Crown Research Institute (CRI) against its Statement of Core Purpose. These reviews are intended to provide Ministers with assurance on the operational effectiveness of the CRI in delivering outcomes that benefit New Zealand, an assessment of governance effectiveness, financial viability and sustainability, together with identification of opportunities and barriers to success.

Two evaluation reviews are being undertaken each year and the cycle of reviewing the seven CRIs will be completed every four years. The Institute of Geological and Nuclear Sciences Limited (GNS Science) is the second CRI to undergo such a review.

A panel of four independent reviewers with experience in governance, corporate finance and economics, senior leadership of science organisations and organisational review undertook the review between October and December 2013. The panel reviewed a significant amount of documentation provided by GNS Science and met with the Chairman, Board, Chief Executive, executive management and science leaders together with a number of external stakeholders.

The Statement of Core Purpose for GNS Science states that *“GNS Science’s purpose is to undertake research that drives innovation and economic growth in New Zealand’s geologically-based energy and mineral industries, that develops industrial and environmental applications of nuclear science, that increases NZ’s resilience to natural hazards and that enhances understanding of geological and earth-system processes”* The Statement of Core Purpose further elaborates on the key outcomes, scope of operation and operating principles for GNS Science and it is against all these that the panel makes its report.

The panel found many positive features including a strong track record built upon nearly 150 years of history. GNS Science is seen as a “trusted advisor to the nation”. There is a passion for science and for benefiting New Zealand embedded throughout the organisation’s highly motivated workforce. GNS Science has an excellent reputation with its key customers for being responsive, open and honest. Its financial performance and controls are good and the organisation is generally well equipped with research infrastructure. All its activity is underpinned by solid practices, processes and policies.

The panel has identified five key opportunities for further organisational development as detailed below.

### **1. Clarity of strategic direction**

GNS Science’s vision and strategic direction were not clear to the panel. Although the recent Statements of Corporate Intent (SCI) were pointed to as the key strategic documents, the panel did not believe that these provided an inspirational “Story of the Future”. The Board’s Strategic Science and User Advisory Panel (SSUAP) has made similar comments recently, while a recent staff climate survey suggests that staff are calling for a more focused strategy. The panel has been advised that the Board and management decided not to update the 2010-2013 Strategic Plan until a new CEO was in place.

There is opportunity for reprioritising amongst GNS Science’s activities and scaling back low priority/low performing activities, particularly across those activities funded by Crown Core funds<sup>1</sup>.

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<sup>1</sup> GNS Science refers to Core Funding as Direct Crown Funding.

Good progress has been made in some areas to establish new areas of innovation with the continuation of the strategic development fund. The panel anticipates also that the appointment of the new CEO will be a catalyst for establishing a clear strategic direction. The balance sheet is sufficiently healthy to allow some risk taking and the panel believes that GNS Science has considerable potential to deliver on an exciting innovation strategy over the next several years.

## **2. Business performance**

GNS Science's return on equity has been strong on average; it is largely dependent on Ministry of Business, Innovation and Employment (MBIE) revenue with solid consultancy and services revenue, while its intellectual property revenue is low. After a downturn in revenue and profitability in the last financial year, GNS Science is forecasting a strong and sustained recovery over the next five years. The projected improvement in profitability is driven by forecast growth in revenue, and in particular by growth in domestic and international commercial revenues. GNS Science's track record of delivering against its financial forecasts has been strong overall to date. Nevertheless, the company's forecasts for commercial revenue look ambitious when assessed against recent years' performance. A key challenge will be successfully commercialising innovative ideas and products while enhancing knowledge and technology transfer of existing ideas and products.

## **3. Accountability for medium-term business targets**

As noted above, the latest SCI sets ambitious financial targets for the next five years. The panel is concerned about the level of commitment to and ownership of the medium-term business forecasts amongst the company's senior management. While there was clear ownership and commitment to the one-year ahead budget numbers, the panel was unable to discern a clear strategy amongst the broader management team for how the medium-term business targets are to be achieved. It could be useful for Divisional Directors to set the medium-term targets for their Divisions and for incentives to be established for achieving them.

## **4. Establishing a high-performance culture**

In its discussions with the Board and management, the panel detected a somewhat conservative approach that was, in the panel's view, symptomatic of a risk-averse culture, especially in financial management, commercialisation practices and priority setting of science. While the panel understands that GNS Science aspires to be world class in the delivery of its research, it is less clear that it aspires to be a world-class research organisation in the broadest sense. The panel encourages GNS to adopt international benchmarks of business best practice and to enhance its business processes to deliver on its top priorities.

Such change will need to be driven from the top and may require changes in the structure of the executive management group and getting the 'team' back into the "executive management" team. The most recent staff climate survey suggests that staff are ready and eager for such changes to happen.

## **5. Māori partnering**

There is clear opportunity for building substantive partnerships with Māori, which support the significant influence Māori will have in the development of New Zealand's natural resources in the post-treaty settlement environment.

Overall, the panel believes that GNS Science is performing very well, despite some recent challenges. The panel also believes that the appointment of the new CEO provides an exciting opportunity for bringing new dimensions to the impact its research can deliver and the robustness of the organisation.

## 3. BACKGROUND

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### 3.1. Context for the rolling reviews

The 2010 Crown Research Institutes (CRI) Taskforce reforms are an integrated suite of changes designed to increase the impact and benefit of the CRIs to New Zealand. Central to the reforms is the intention to increase the CRIs' focus on collaboration with and efficient technology transfer to the sectors and key stakeholders they serve.

Each CRI has adopted a Cabinet-approved Statement of Core Purpose (SCP) which reflects this focus and clearly articulates the purpose, outcomes and strategic role for the organisation. The SCP for the Institute of Geological and Nuclear Sciences Limited (GNS Science) is attached as Annex 1.

To ensure CRIs continue to increase their contribution to New Zealand's economic, social and environmental well-being, the CRI Taskforce also recommended, and Cabinet agreed [CAB Min(10)43/5C refers], that the government evaluates the performance of each CRI against its SCP through a process of independent rolling reviews.

It has been agreed with the Minister of Science and Innovation that two reviews will be undertaken each year. Given that the cycle of reviewing the seven CRIs will be completed every four years, these reviews will be known as the four-year rolling reviews. These reviews are described as rolling for two reasons: firstly, because they are designed to review each CRI successively, and secondly, because they will draw on an aggregation of performance-related information that is already routinely generated to inform the matrix of monitoring and assessment processes established around the CRIs.

### 3.2. Purpose of the review and this report

The purpose of these reviews is to provide shareholding Ministers with insights on where each CRI's performance can be improved and assurance on where the CRI is operating effectively in delivering outcomes that contribute to New Zealand's economic, social and environmental well-being. The reviews will include an assessment of governance effectiveness, financial viability and sustainability as well as an identification of opportunities and barriers to success. Findings from the reviews will also support CRI Boards in their governance role. This report is the outcome of the second such review, that of GNS Science. The review was undertaken between October and December 2013.

### 3.3. Scope of the review

As outlined in the Terms of Reference for the review, each CRI's SCP provides the scope of enquiry for the four year rolling review. The review is expected to evaluate the CRI's performance and progress in delivering to the purpose, outcomes, scope of operation and operating principles in its SCP. There will also be some consideration of the likely durability of outcomes in the current economic and environmental context. The reviews are expected to evaluate factors that influence the CRI's overall success in contributing to its SCP outcomes now and into the future.

Every year each CRI, in collaboration with key stakeholders, measures and evaluates its impact on its respective sectors. The independent panel undertaking the four-year rolling reviews is not expected to duplicate this work. However, based on the measures and assessment generated by the CRI, the panel should evaluate how well the CRI is contributing to the outcomes in its SCP and assess the quality of the measures used to inform that assessment.

The Terms of Reference have the following as out of scope:

- how science reviews are undertaken by the Science, Skills and Innovation Group; rather the science reviews themselves may be sourced as an informational input into this project;
- measuring the performance of the CRI in delivering against individual contracts; rather the panel will evaluate how the CRI manages its contracts overall; and
- measuring the CRI's science quality; rather the panel will evaluate how well the CRI is monitoring, measuring and improving science quality.

### 3.4. The review panel and processes

Panel members were appointed to ensure an appropriate mix of experience in governance, corporate finance and economics, senior management of science organisations and organisational review. The panel membership was Philip Barry (Chair) and Drs Helen Anderson, Allan Freeth and Tricia Harris. Brief biographies for the panel members are attached as Annex 2. The panel reviewed any potential conflicts of interest that members may have in relation to this process. There were no direct conflicts identified. Relevant indirect issues were managed throughout the review process.

The panel was appointed by the Ministry of Business, Innovation and Employment (MBIE) in late September 2013 and it convened on October 22nd 2013. Prior to the first meeting, panel members were provided with a range of background material from both MBIE and GNS Science. The information from GNS Science was based on an information request and further information was provided throughout the period of the review. The full list of information provided to the panel through the review is detailed in Annex 3.

In undertaking the review the panel sought to be:

- a. independent: working closely with GNS Science and MBIE, but remaining independent of both to ensure the panel's report reflects an independent assessment;
- b. objective: the review sought to be objective and as far as possible evidence-based. The panel sought to be open minded and 'let the facts and the numbers do the talking';
- c. interactive: the panel consulted with members of the GNS Science Board and senior management team during the review and GNS Science had the opportunity to see and comment on matters of factual accuracy in the draft report before it was finalised; and
- d. efficient: the panel aimed to be efficient in their engagements with GNS Science and keep compliance costs to a minimum.

The panel met with the executive management, some of the third-tier science leadership and younger scientists over three days at the Avalon and Gracefield campuses. Further meetings were held with staff at the Wairakei Research Centre. The panel met with the Chair and Deputy Chair of GNS Science and held meetings or teleconferences with a number of external stakeholders. The full list of those the panel met with, or spoke to, is provided as Annex 4.

The panel discussed its preliminary findings with the GNS Science Board at its meeting on 20 November 2013. A draft report was provided to both MBIE and GNS Science for comments on matters of accuracy on 25<sup>th</sup> November, and the final report was provided to MBIE and GNS Science on 6<sup>th</sup> December.



## 4. HOW WELL IS GNS SCIENCE DELIVERING NOW AGAINST ITS SCP?

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### 4.1. Context for assessment

A CRI's performance is measured against two key deliverables:

1. the impact of its research in relation to economic, social or environmental benefits for New Zealand; and
2. the financial performance of the CRI.

The panel provides below its assessment of the current performance of GNS Science in delivering against its SCP within the context of the current operating environment for CRIs.

### 4.2. Purpose

All CRIs are required to undertake research to contribute to New Zealand's economic growth and environmental and social prosperity. In particular, GNS Science's purpose, as outlined in its SCP, is to *'undertake research that drives innovation and economic growth in New Zealand's geologically-based energy and minerals industries, that develops industrial and environmental applications of nuclear science, that increases New Zealand's resilience to natural hazards and that enhances understanding of geological and earth-system processes'*.

GNS Science traces its history back nearly 150 years to the New Zealand Geological Survey, then merging into the DSIR and incorporation as a CRI in 1992. It has had a long, proud and stable heritage to call on as it has moved into the 21<sup>st</sup> century. This review encompasses only the last four years of GNS Science's operations. During this period, as a result of the CRI reforms (see Section 3.1), a key requirement for GNS Science, as with the other CRIs, has been to move from a delivery model that focused primarily on accountability for contracted outputs to one of investing in delivering impacts and outcomes for targeted sectors.

The stated Core Purpose of GNS Science is broad ranging, with a focus on delivery of research in its fields of activity. The panel considers that GNS Science delivers well within the framework of its current Purpose. The panel also notes that GNS Science devotes a significant proportion of its effort to technology transfer<sup>2</sup> from that research, a majority of which is fee-for-service consultancies. This is very appropriate given the moves in accountability already outlined. However, it is not clear from the impacts and outcomes reported to the panel whether the combined research and technology transfer activity is driving innovation and economic growth for New Zealand (see Section 5.7).

The 2013/14 Statement of Corporate Intent (SCI) signals an intention on the part of GNS Science to accelerate both national and international technology transfer activity over the next five years. To support this intention the panel suggests that the current wording of Purpose should be expanded to *'undertake research **and technology transfer** that drives innovation and economic growth.....)*. Other than this, the current Purpose within the SCP is considered appropriate.

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<sup>2</sup> GNS Science uses the words 'Technology Transfer' to encapsulate all non-Core or contestable MBIE funded activities. It covers both knowledge and technology transfer as either partnered or fee-for-service activities and also commercialisation of intellectual property.

### 4.3. Outcomes

The key outcomes sought by GNS Science in order to fulfill its core purpose are to:

1. *increase resource security and economic benefit from the development and diversification of New Zealand's oil, gas, geothermal energy and minerals industries;*
2. *increase New Zealand's resilience to natural hazards and reduce risk from earthquakes, volcanoes, landslides and tsunamis;*
3. *improve the sustainable management of and increase economic returns from groundwater resources;*
4. *create value for New Zealand industry through the use of isotope and ion beam technologies;*
5. *increase understanding of the geology and past climates of New Zealand, the Ross Dependency and Antarctica;*
6. *enhance the geotechnical engineering that underpins New Zealand's transport and energy infrastructure.*

The stated Outcomes appear to the panel to be very broad ranging and perhaps were written to encompass all research activity of GNS Science at the time of the agreement with government. While recognising that GNS Science has consistently delivered to all of these outcomes over the last four years, the panel is of the view that they are not equal in potential impact and that some seem marginal to its Purpose and perhaps more closely aligned with the core business of other research organisations. In part, this is because the broader science ecosystem has evolved quite significantly over the last four years as a result of implementation of the CRI reforms and movement towards the National Science Challenges. As further outlined in Section 5, the panel believes that there would be benefits from GNS Science focusing its scope of activity in order to best deliver on its Purpose.

The panel believes that Outcomes 1, 2 and 5 listed above are fundamental to the delivery of GNS Science to its Purpose. However, Outcomes 3, 4 and 6, while comprising significant areas of quality research for GNS Science could be usefully realigned if the opportunity to change the current SCP were to arise. Such repositioning could involve a shift in priorities but is not intended to suggest that the panel believes that GNS Science should withdraw from the research outcome areas:

- Outcome 3 could be addressed through another organisational construct (perhaps the new 'Our Land and Water' National Science Challenge) where there is a critical mass of research;
- the panel recognises the quality of research outputs and the commitment of GNS Science Board and Management to support infrastructure and delivery to Outcome 4. However, although there are some promising nanotechnology based research projects it is unclear to the panel how successful GNS Science can be in taking this facility beyond fee-for-service to partner further along the value chain to deliver valuable intellectual property and ground breaking products (see Section 5.3 for more detail); and
- the panel views Outcome 6 as a subset of Outcome 2 with its focus on hazards research.

### 4.4. Scope

The outcomes discussed in Section 4.3 should be achieved by effective utilisation of the capability and science assets held within GNS Science or by partnering with others. Key responsibility has been given to GNS Science to be the 'lead CRI' in a number of areas as stated in the scope of operation. Following on from the view already expressed for refinement of the Outcomes, the panel believes that, rather than a

leadership role, GNS Science should be seeking to be a partner in both ‘groundwater processes and quality’ as part of the ‘Our Land and Water’ National Science Challenge and perhaps in ‘geobiological resources’ research.

There are also two domains where GNS Science is listed as support where the panel is of the view that it could be the lead:

- hazards management where GNS Science is clearly not only the host but also the dominant research organisation in the Natural Hazards Research Platform; and
- with the creation of Callaghan Innovation there needs to be clarification as to who now is the lead CRI for High Value Manufacturing research as current CRI research is fragmented with the national research strength located in the universities. As Callaghan Innovation research expertise is re-positioned for the future, there may be opportunities for GNS Science. However, as noted above, it would need to considerably enhance its commercialisation skills and partnerships if it is to strengthen research activity in High Value Manufacturing. If it commits to doing so and develops a proactive strategy, then it could be the lead CRI alongside university partners.

## 4.5. Operating principles

An overview of the panel’s position on GNS’s performance against each of the operating principles within the SCP is provided below. Where the panel has concerns, these are elaborated in Section 5.

### Statement of Corporate Intent and Business Plan

GNS Science has delivered annually a Statement of Corporate Intent; however, there does not appear to have been a separate organisationally integrated Business Plan. Internal to GNS Science there are some individual business plans, but these appear to be *ad hoc* rather than systemic to the organisation’s planning. In addition, demonstration of outcomes from the SCIs is primarily anecdotal and does not clearly describe what the shareholders will, or have, received from their investment (see Section 5.7 for further elaboration).

### Obligations as a Crown company

GNS Science has met most of its obligations as a Crown company. It has been one of the better performing CRIs in meeting its targeted return on equity. Section 5.2 provides further comment from the panel around this aspect of performance.

### Partnerships

GNS Science has some very strong and enduring partnerships with industry and government. While the panel heard evidence of strong, expert support to industry partners in information sharing (e.g. resource consent consultation and evidence provision) with Māori, direct partnering with Māori appears nascent, with much discussion but little action. The panel heard a number of comments from external stakeholders focused on slow contracting processes, but the recent stakeholder survey did not identify this as an issue, rather the survey results focused on timeliness of project delivery. There does not appear to be a disciplined project and account-management process which would address this and other partnership issues. These issues are addressed further in section 5.4.

## Balance of research

The panel understands that research staff have concerns with the move towards a greater proportion of technology transfer activity relative to underpinning research. Overall, the panel believes that GNS Science is managing the tensions and risks around this balance very well, and should continue current practice as long as the leadership continues to monitor the balance, and staff concerns, in a proactive way.

## Knowledge and technology transfer

GNS Science is an exemplar to other research organisations in some areas of knowledge and technology transfer, especially in supporting its sectors in geothermal and deep drilling, hazards response and management. It is, however, less successful in its commercialisation of intellectual property as products (see Section 5.3).

## Collaborative relationships with other research institutions

The list of GNS Science's collaborative relationships is extensive, both nationally and internationally, but the depth and value of the relationships are extremely difficult to assess. The panel's view is that KPIs for research collaboration should move beyond the reporting of jointly authored papers and that impact assessments should incorporate measures for the benefits gained from collaboration, both internationally and within New Zealand.

The most significant collaborative relationship with other research institutions is through the Natural Hazards Research Platform (NHRP). The panel looked in some detail at the NHRP (section 5.7) and on the whole believes that the relationships between previously fractious and competitive organisations (CRIs, universities and a private company) have matured and there are now some positive developments in managing the natural tensions of such arrangements.

## Advice to the Crown

GNS Science is active in providing advice to a range of Crown agencies and departments. The panel understands that in general it is extremely responsive to major client requests at short notice. The panel had feedback that GNS Science can be naïve in machinery of government, for example it could be more proactive in using senior leadership, and board representation as appropriate, in pursuit of cases for funds and absorbing advice around the management of such processes.

## Representation of New Zealand

Representation of New Zealand is an increasing area of strength for GNS Science, especially in its growing profile with NZ Aid, but also in representing New Zealand on a wide range of international fora. While the panel sees the value that New Zealand can derive from such activity on the part of GNS Science, it notes that the growth planned in the forecast revenue streams will demand a lot of initially unfunded work before formal contracts are able to be secured to recover costs. Further, such representational activities are likely to always be low margin activities. However, such representational activities can also effectively be pre-sales activities for direct international contracts for GNS Science and other New Zealand businesses. The panel believes that the opportunity costs and benefits of this activity should be formally quantified, so that a framework can be established with the larger partners such as NZ Aid in order to reduce compliance for all parties.

## Advisory panels

In implementing the recommendation of the CRI Task Force with respect to establishing both Science and Stakeholder advisory panels to the Board, GNS Science decided to combine the two streams of advice into a single panel, the Strategic Science and User Advisory Panel (SSUAP). This four year rolling review

panel acknowledges the intent of GNS Science, but has reservations about the value and effectiveness of the current SSUAP, which appears to be working outside its terms of reference. In addition, it is overly academic in its membership and not sufficiently able to provide end-user advice (see Section 5.1.2). Based on the minutes the panel was provided with, other external advisory committees for specific areas of research activity appear to be variable in the timeliness, quality and relevance of their advice and the uptake of that advice by GNS Science. There appears to be some move towards using targeted stakeholder forums rather than standing advisory committees to address stakeholder concerns, an approach which the panel endorses. Overall, the panel supports maintenance of a Science Advisory Panel focused on assuring the quality of the research and the vitality of the research teams alongside targeted user groups or forums.

### Talent recruitment and retention

GNS Science recognises that it has a significant problem in talent recruitment and retention in one research area where industry is highly competitive. There is clear reluctance by executive management to address this through individually tailored remuneration packages on the basis of maintaining 'equity' for other staff. There is a reasonable turnover of staff across most of the science teams, which provides some capacity for managed change in skill sets and diversity. GNS Science has a very active post-graduate training programme, which it supports with significant Core Funding. A review of the benefits of this investment may be timely. Rather than post-doctoral contracts, GNS Science in at least some teams has chosen to recruit young staff internally on permanent contracts. Diversity within the research staff is generally improving with a recent increase in women into 3<sup>rd</sup> tier management positions. The executive management has low levels of diversity and a stronger, revitalised and inspirational management may be more readily achieved with new and different perspectives.

### Māori

While GNS Science has a strong voice for Māori, in the executive team there is no current track record of building substantive partnerships with Māori and current activities are mainly transactional in nature. It is urgent that this area of activity be addressed. This is discussed further in Section 5.4.

### Databases, collections and infrastructure

GNS Science has a strong record of maintaining nationally significant and other databases, collections and associated infrastructure, and in the case of GeoNet has responded actively to international and New Zealand Government moves to more open research, intellectual property and data policies. There is still work to be done in other areas of data release, including from some of the nationally significant databases and collections the organisation maintains. However, there is a tension between the desire of government for open data access and the desire by GNS Science to protect information and assets with potential value as outlined in GNS Science's Data Collections Management Policy.

### Shareholder consents

The panel has not identified any significant activity by GNS Science outside its scope of operation and is not aware of GNS Science seeking shareholder consents for any new activities outside its existing scope of operations. The panel feels GNS Science has, if anything, been conservative in thinking about such potential game-changing arrangements.

## 5. KEY ISSUES THAT INFLUENCE THE ABILITY OF GNS SCIENCE TO DELIVER TO THE SCP IN FUTURE

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### 5.1. Leadership and direction

To advance the consideration of the panel's observations on governance and leadership the Four Pillars convention, developed by the New Zealand Institute of Directors as a best practice framework, was adopted for this Report<sup>3</sup>.

#### 5.1.1. Determining direction

*The board must take ownership of the entity's strategic direction. The board adds value by leading the development of the entity's purpose, goals, and strategy<sup>3</sup>.*

The panel found good awareness of and affinity with the SCP throughout GNS Science. In particular, the sentiment of working for the good of the nation and creating economic value resonated with the majority of staff interviewed as part of the review process.

Especially notable was the passion and commitment held by the group of younger staff for the contribution of their research and work to New Zealand's economy and society.

Nonetheless, the panel received strong and consistent feedback from a wide range of staff below executive management, for the articulation of a clearer strategy and direction for GNS Science. While the SCI was acknowledged as a key document for GNS Science in respect of its obligations to the government, staff stated clearly that they did not consider this a strategic plan.

Such a strategy could articulate better the organisation's competitive advantage and clearly define its purpose within the context of the SCP. The SCI was seen as a broader indication of the range of GNS Science's interests and activities as opposed to an indication of strategy. Likewise, the Core Science Area plans, while comprehensive, are not integrated across the organization. The panel was advised that the Board and management decided not to update the 2010-2013 Strategic Plan until a new CEO was in place; however, staff did not seem to be aware that this was the intention.

The need for an organisation-wide strategic plan was expressed most strongly amongst groups of staff who held research leadership positions in GNS Science. In the absence of such guidance, many were developing their own department-specific strategic plans to guide their activity over the medium term.

This sense of uncertainty over direction appeared to be further compounded by the variable quality and quantity of communication in respect of goals and targets beyond the current year. This issue is further commented on in Section 5.1.3. Somewhat disconcertingly, one senior leader stated he had no visibility of the five year plan and its numbers.

A clearer articulation of direction for GNS as a whole would help address a number of the discussion themes that staff raised with the panel. These included:

- the balance between scientific research and commercial work;
- uncertainty as to the organisation's commitment in terms of certain areas, e.g., NIC;
- solutions for the challenge of the static core funding and the belief of inevitable cuts to staffing;

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<sup>3</sup> Institute of Directors in New Zealand (Inc). 2012. *The Four Pillars of Governance Best Practice*.

- confusion as to the appetite for risk in respect of long-run, research-led commercial ventures;
- positioning in terms of the National Science Challenges for GNS Science as a whole and for various areas and platforms within the organisation; and
- the issue of growth. Several staff asked why we need growth, why it is a priority, and what benefits does it bring?

The desire for a clearer strategic direction was not confined to GNS Science staff. The SSUAP also took this position in their advice to the Board in February this year:

*“The Statement of Corporate Intent (SCI) has become a specialised document that is difficult for the general reader to understand. A particular problem relates to its framing around government outcomes without firm indication of which outcomes can be adapted and ensured by GNS Science. Statements are awkward that discuss linkage between government-wide goals with benefits to accrue from GNS Science research. The result is a document that may meet statutory reporting requirements but does not represent a useful strategy document for GNS Science. Neither is it particularly inspiring to be read by staff or potential research partners.”*

The panel believes the appointment of a new Chief Executive Officer (CEO) provides a unique and valuable opportunity to energise and focus the organisation through a strategic planning process led by the CEO. In turn, the strategy outputs of this process would provide the rationale for any structural change and inform the development of the SCI for the coming year.

In the panel’s view, a strategic plan will tell the ‘story’ of GNS Science and its vision of success in the future, articulate the value of the whole, as opposed to the sum of the individual parts of the business, including the integration of research and commercial activities.

### 5.1.2. An effective governance culture

*The board adds value by acting as a team with a high-performance culture committed to engaged, quality governance of the entity. It celebrates debate, diversity, thoughtful challenge and dissent. Board members are recognised for their commitment, candour and integrity. The culture is characterised by effective relationships between board members and with management, shareholders and stakeholders<sup>3</sup>.*

The Board of GNS Science has a comprehensive and clear Board Charter, although it seems the Board has not reviewed, or endorsed, this Charter since its adoption in June 2002.

Charters exist for other Board Committees, and Terms of Reference (TOR) are in place for Advisory Committees. The panel notes and commends the Board of GNS Science for the formation of a specific committee for Health and Safety, given the nature of the organisation’s work. In the light of the Pike River findings and the impact of new legislation for work place safety, the Board’s initiative is an example of good leadership.

The panel discussed with the Chair the composition of the Board and notes his satisfaction with the level of experience, skills and diversity around the Board table. In respect of the SCP, backgrounds of Directors show a good fit, but in light of the observations of this report in respect of innovation, commercialisation and risk appetite, the panel would suggest the addition of a Director with a core career in business, perhaps in technology-related industries, may add value to the organisation. Given the importance of

growth in international revenue to achieving the organisation’s medium-term business targets, new Board members with strong international networks would also be valuable.

One area of concern to the panel was the role of the SSUAP and its relationship to Board governance responsibilities and the Science Committee of the Board. While the TOR of this group are clear and are designed to seek the views of a group of distinguished scientists to review the types of science undertaken by GNS Science and the priority given to each area, the minutes of the SSUAPs’ meetings would indicate a wide range of issues are being considered, many of which overlap directly with the governance capabilities of the Board.

The panel observes that unless the roles of such advisory groups are managed within their original intent, there is potential confusion around governance accountabilities and decision making. In fairness to the role of the SSUAP, a number of participants have acknowledged the need for renewed focus on its TOR.

Further, GNS Science makes use of a considerable number of advisory groups for specialised input and review throughout the organisation. This is a sensible approach, given the specialised and highly technical nature of much of GNS Science’s work. However, this mechanism, combined with the matrix management structure of GNS Science, has the potential to create management complexity and challenge.

A review by the panel of selected Board papers, agendas, and minutes raises no specific concerns in relation to governance culture or with alignment to the SCP. Board papers appear to be generally of good quality, a systematic capital approval process exists, there is satisfactory Director attendance, a wide diversity of topics related to GNS Science are covered and all necessary Board requirements for resolutions and the like appear to be undertaken to an annual timetable.

### 5.1.3. Holding to account

*A value-adding board holds management strictly and continuously to account through informed, astute, effective and professional oversight. It does not do the job of management but ensures purpose and strategy are understood by management and implemented according to a clear plan with proper resource deployment, task allocation, and performance management<sup>3</sup>.*

There appears to be no shortage of reports, reviews, and measures in the material provided to the panel and as evidenced by discussions held with various GNS Science personnel. These reports and outcome

#### **Christchurch – an acknowledgment**

No review of GNS would be complete or balanced without an acknowledgement of the valuable role the organisation played and continues to play in the tragic earthquakes that struck Canterbury three years ago.

In the centre of the tragedy were GNS scientists. No one would wish for such an event, but for a student of the earth science, such an event provides a wealth of valuable information to understand earthquakes and save lives in the future.

The panel’s review of documents, discussions with staff, and scientific briefings has highlighted the considerable contribution GNS has made to the community of Christchurch and the management of the tragedy after the quakes.

The panel has no doubt that the efforts of GNS have saved lives in Christchurch and the organisation’s ongoing work in Canterbury will assist communities globally to prepare and manage for such disasters.



measures are related to the SCP and SCI and the organisation takes care in ensuring the connections with its obligations to the Crown are identified.

The Health Check reports, especially, were noted by the panel to be very comprehensive and detailed and were the product of collaboration across departments and research teams. Clearly, considerable effort went into these reviews and the panel commends the staff involved in their production.

Such analysis and reporting, while admirable in its own right, is of little value if it is not driving performance, accountability or improvement in business, operational or research outcomes.

The panel suspects that the myriad of reporting and reviews, within the matrix structure employed and the variable knowledge and understanding about medium term targets, is hindering the Board's ability to hold management to account and drive improved performance. This view is expanded on below.

The panel was concerned about the short-term (current year) focus of leaders and staff in GNS Science and the lack of awareness of the targets and aspirations for the five-year time frame, 2013 to 2018, outlined in the SCI.

From some members of the executive management down, few staff members seemed to be aware of the 2018 targets, including the \$92 million revenue target. Executive management members, when asked, could not recall communicating the breakdown of these numbers in their divisions or departments, nor had been asked to 'sign-up' to their achievement.

The financial plan for the 2013 to 2018 period requires significant growth in commercial revenue, most notably off-shore. In response to questions about what the business intended to do differently to secure this revenue (given the constraints of the consultancy model), no senior manager advanced concrete strategies or action plans to the panel.

The panel notes the important role department heads play in the formation of budgets and targets, but is concerned that they indicated a 'business as usual' approach with little apparent incentive to drive 'game changing' initiatives.

For the Board to hold management to account, clear role responsibility and outcome accountability must exist. As is entirely appropriate, GNS Science operates a matrix management structure with three business areas vertically, and the research programme leaders and other support units on the horizontal axis of the matrix. However, accountabilities appear mixed with some research programme leaders claiming to spend up to 50 percent of their time sourcing new commercial business.

Many corporations and businesses successfully operate a matrix structure. To fully exploit synergies, encourage innovation and team work, they have developed mechanisms to ensure the matrix functions to its fullest extent. These include scheduled cross-functional planning and governance teams, regular shared business/programme reporting and communication, open-plan offices and events and conferences to promote interaction. GNS Science does not appear to have these.

In addition, role clarity and clear accountability for outputs are essential for the optimal performance of a matrix-structured organisation, and most organisations will seek to drive accountability at an individual level 'down' the structure, with shared targets and accountabilities at the 'higher' senior and leadership team level (where more ability to influence whole organisation outcomes is held by managers).

The panel understands that below the executive management there is no ‘at risk’ component. It is unclear to the panel whether part of the executive management’s ‘at risk’ payments is related to total organisational performance. The panel raises this issue in response to its sense that GNS Science is composed of a series of silos rather than ‘one team GNS Science’.

In the context of remuneration for research and commercial success, the manner in which success is rewarded and celebrated has to be managed in the context of the organisational culture, as it is today or desired for the future. The idea that an individual could benefit materially from an innovation that adds value to New Zealand would not appear to be a natural fit with GNS Science’s culture. Conversely, the idea that an individual may be penalised or lose their job for missing targets may equally be unacceptable.

#### 5.1.4. Compliance

*The board adds value by ensuring the company is, and remains, solvent. It ensures the probity of financial reports and processes and a high standard of compliance with regulatory environments. Risk management is a key feature of the board’s capability and the board should scan and manage existing and prospective risk to the entity<sup>3</sup>.*

The panel believes compliance (as defined broadly above) is an area of strength within GNS Science with strong leadership shown by the Board as evidenced by the documents provided and discussions with executive management members.

The documentation provided shows the organisation is diligent in meeting its requirements under the various Acts detailing its operation and reporting to the Crown shareholder.

The minutes available for review of the Board and the Audit and Risk Committee detail discussion around best practice, risk management, IT and systems risks and reporting by the internal audit function. In addition, considerable work has been completed on the environmental and business risk review and resulting matrix with individual plans associated with identified risks.

The establishment of a Health and Safety Committee has been previously noted, and there is strong evidence for the focus and concern the Board and executive management share for the safety of staff that operate in hazardous environments.

#### 5.1.5. Footnote

Innovation and creativity are crucial to scientific research and to successful commercial endeavours. There is considerable literature deriving from work in the academic and business worlds about mechanisms and strategies to create and develop organisational cultures that drive innovation.

Successful innovative organisational cultures are seen to be fully integrated in terms of governance, management, structures, incentives, and rewards. In this context, the role of the Board as organisations evolve is a pertinent issue. What is the Board’s responsibility for nurturing innovation and is it prepared to accept the inevitable mistakes and, perhaps, losses while meeting the responsibilities outlined, for example, by the Four Pillars framework<sup>3</sup>.

The panel, as noted elsewhere, has observed that GNS Science exhibits a low risk appetite in its financial, commercialisation and research prioritisation practices. It also appears somewhat conservative and hierarchical in its leadership practices, consistent with its history and development. The panel believes the organisation would benefit from some flexibility in approach and suggest opportunities, for example,

for the Board to drive in assessment of the proposals for the strategic development fund or to receive presentations from more junior scientists on their ideas and proposals. This, in the panel's opinion, would help change the nature of the dialogue and the process around innovation and potential commercialisation in GNS Science.

### **GeoNet**

One of GNS's success stories in recent years is GeoNet, a network of geophysical instruments, automated software applications and staff to detect, analyse and respond to earthquakes, volcanic activity, large landslides, tsunamis and the slow deformation that precedes large earthquakes.

The public face of GeoNet is <http://geonet.org.nz/>, the website for geological hazards information for New Zealand. The GeoNet site has become a household name and is the "go-to" site for timely and comprehensive information on earthquakes in New Zealand. The website also contains information on tsunamis and volcanoes. The site is user-friendly, with an earthquake-only application (GeoNet Quakes) available on mobile platforms.

GeoNet would appear to have commercialisation potential, with opportunities for revenue raising in the domestic and/or offshore markets:

- in the domestic market, the website and mobile platforms may be able to generate advertising revenue. Given the large increase in site visitors around sizeable earthquakes, the sites may be of particular appeal to sellers of hazard-related products: eg earthquake or emergency survival kits; and
- overseas, similar networks may be able to be established, leveraging off the expertise and know-how GNS has acquired through GeoNet. The site may be particularly attractive in countries which are both populous and prone to earthquakes and other geological disasters around the Pacific rim.

## 5.2. Financial viability and sustainability

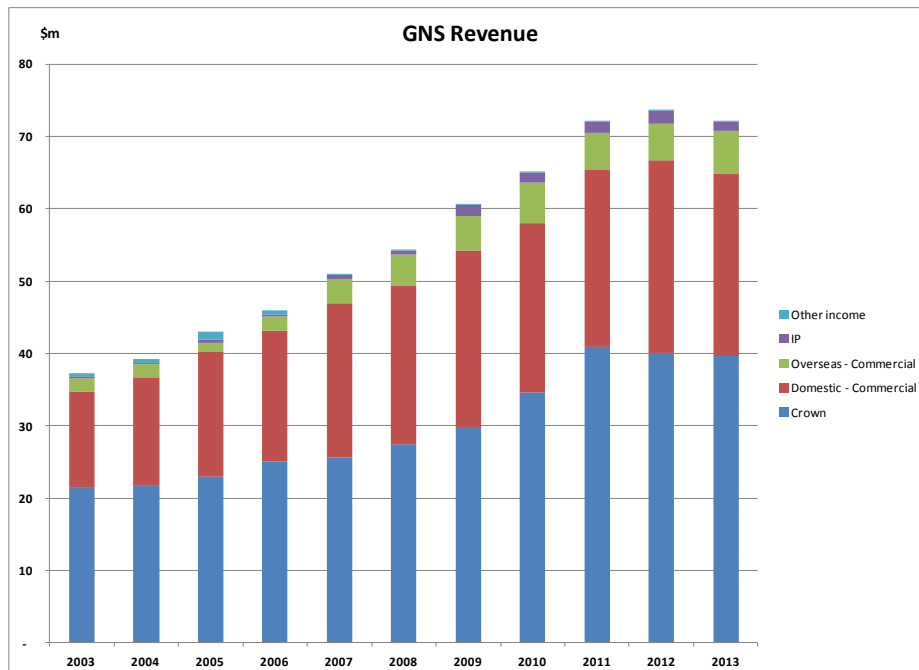
GNS Science's financial performance has been strong on average over the last three years relative to the other CRIs, s9(2)(b)(ii)

The company's reported return on equity (RoE) over the period averaged 9.4% (versus a cost of capital of 7.5%).  
s9(2)(b)(ii)

The company's strong financial performance relative to its peers reflects its underlying productivity, as measured by revenue per FTE, s9(2)(b)(ii)

As shown in Figure 1 below, GNS Science's total revenue has increased by 94% in nominal terms (and 50% in real terms) over the last 10 years.

**Figure 1: Revenue 2003-13**



However, the growth in revenue has slowed significantly over the last 3 years, with the growth rate declining from 7% p.a. to 3% p.a. (refer Table 2 below).

**Table 2: GNS Science’s revenue growth**

GNS Revenue Growth				
	10 year growth		3 year growth	
	Total	CAGR	Total	CAGR
Crown	s9(2)(b)(ii)			
NZ commercial				
International commercial				
IP				
Other income				
<b>Total</b>	94%	7%	11%	3%

\*CAGR = compound annual growth rate

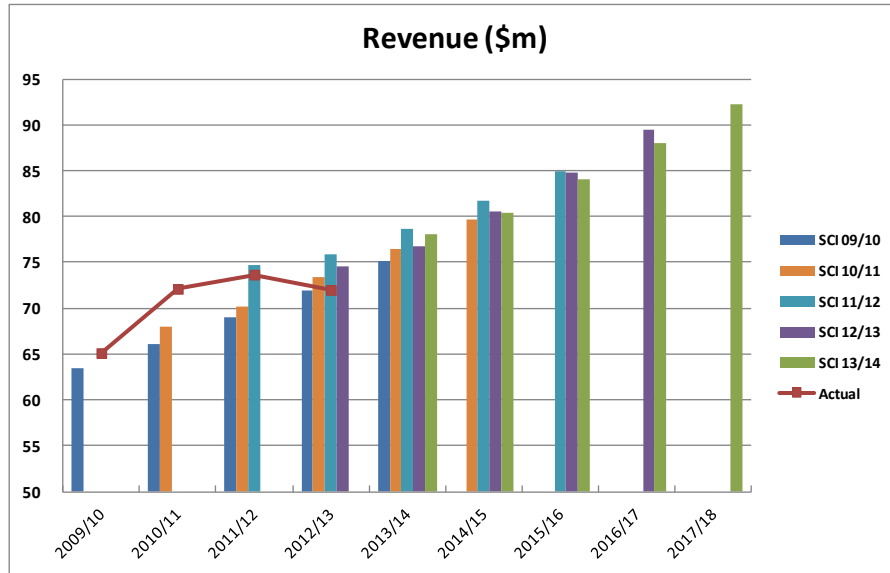
GNS Science’s financial performance deteriorated in the most recent financial year (ending 30 June 2013), with the company’s reported RoE declining to 4.2%, largely on the back of declines in domestic commercial revenue<sup>4</sup>.

Over the last four years GNS Science has remained largely government funded with Vote Science accounting for 55% of GNS Science’s total revenue in 2013.

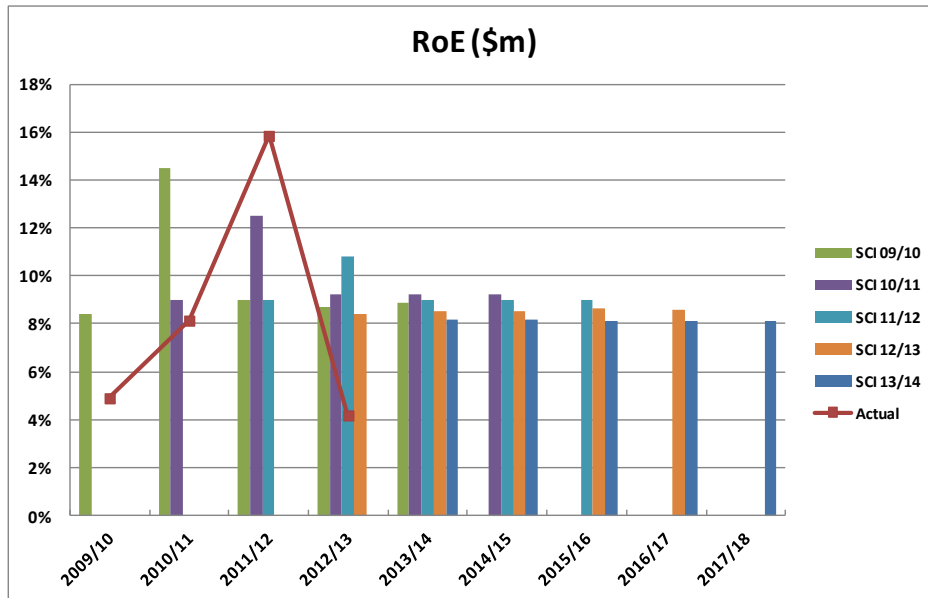
Our evaluation of GNS Science’s financial forecasts (from successive SCIs) indicates that GNS has generally delivered well on its medium-term projections for revenue and RoE over the last four years (refer Figures 2 and 3 below). Revenue has generally been close to or exceeded the company’s forecasts. RoE in 2013 was well below that forecast in all the SCIs but in the previous year was well above the preceding SCI forecasts.

<sup>4</sup> GNS Science refers to commercial revenue as technology transfer revenue.

**Figure 2: Successive SCI projections of revenue and actual results to date**

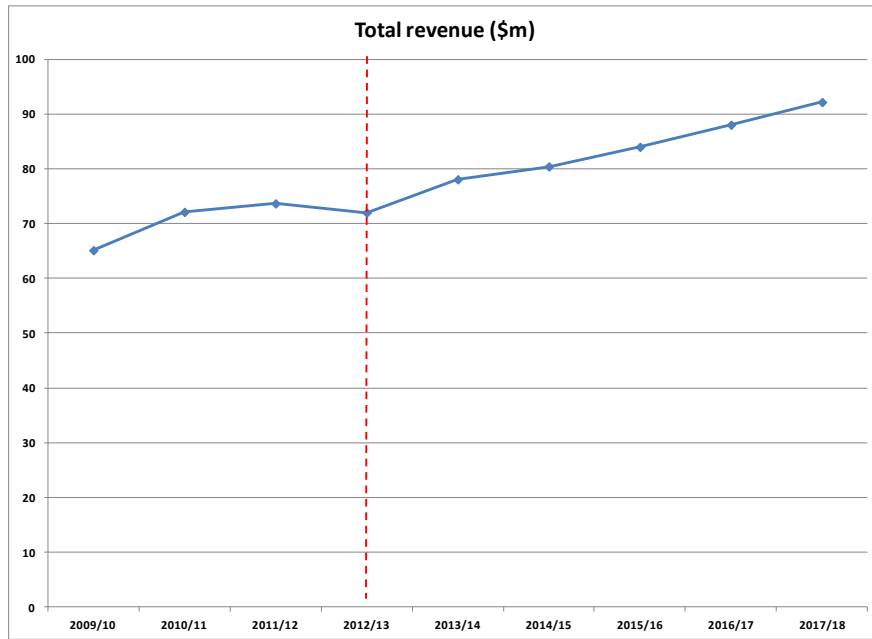


**Figure 3: Successive SCI projections of return on equity and actual results to date**

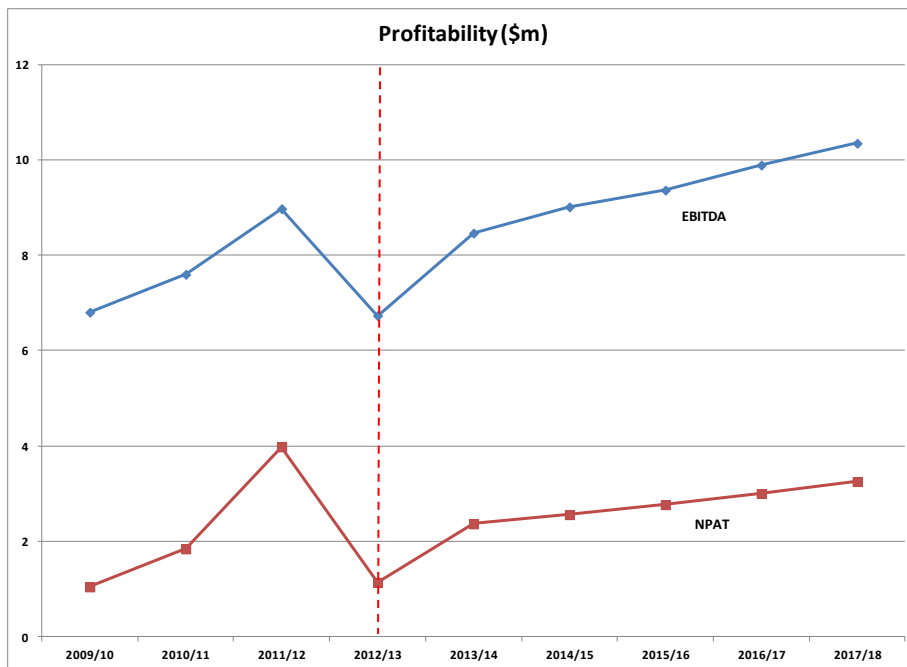


The forecasts in the latest SCI (refer to Figures 4 and 5 below) show a marked pick up in forecast revenue when compared to the growth achieved in the last three years, while profitability (as measured by EBITDA and NPAT) is projected to increase significantly after the recent downturn.

**Figure 4: Historic and forecast revenue**



**Figure 5: Historic and forecast profitability**



With government revenue projected to remain largely flat, GNS Science’s forecast increase in profits is driven by projections of strong increases in commercial revenue (both domestic and international). The latest SCI projects GNS Science’s commercial revenue increasing by 12% per annum on average in each of the next five years (a total increase of 74%). As Table 3 below shows, the projected growth in GNS Science’s domestic and international commercial revenues significantly exceeds that achieved over the

last three years. International revenues have been flat over the last three years but are projected to increase on average by 13% p.a. in each of the next five years (a total growth of 84% in five years). Domestic commercial revenues are projected to increase on average by 11% p.a. over the next five years, a rate markedly above the 3% average annual growth rate achieved over the last three years.

**Table 3: A comparison of actual and projected commercial revenue growth**

Commercial revenue growth: historic vs latest SCI projections		
Compound annual growth rate	Actual 2010-13	Forecast 2013-2018
NZ commercial	s9(2)(b)(ii)	
International commercial		
Other income		
Total commercial	2%	12%

As discussed in section 5.1.3 above, the panel has been able to discern little sense of ownership of these medium-term financial projections at the Divisional level in the business. The Divisional Directors were well aware of their short-term (budget) projections but had no awareness of the medium-term financial projections. As a result, the Divisional Directors had no plans in place for achieving the medium-term financial targets.

From a balance sheet perspective, GNS Science has strong financial capacity, with term debt (ie, debt with a maturity longer than one year) of around \$3.3m, an unused line of credit facility of \$2m and a cash balance of around \$6.9m (as at 31 October 2013). Forecast capital expenditure over the period 2013 to 2017 is \$34.4 m, equal to 100% of the 2013 asset cost reported in the balance sheet and \$7.1m in excess of projected depreciation over the five year timeframe.

GNS Science paid a dividend of \$0.55m in 2012/13, a payout of 14% of the previous year's net profit. In the panel's view the regular payment of a dividend is a signal of an organisation's financial viability. GNS Science forecasts annual dividends of only \$0.1m p.a. on average over the next five years, reflecting a dividend yield of less than 1% p.a. on the Crown's equity investment.

Overall, while GNS Science's financial performance over the last four years has been solid, in the panel's view there is considerable risk around the current medium-term financial projections being achieved. The forecast increases in commercial revenue look ambitious and the panel is concerned about the level of commitment to the medium-term business forecasts amongst the company's senior management. Most importantly, as noted in section 5.1.1 above, GNS Science needs to develop as a matter of priority a strategic plan that demonstrates how it plans to achieve its financial forecasts for the next five years.



### 5.3. Commercial revenue strategy

The challenges of delivering an appropriate RoE to remain financially sustainable have been brought into stark relief by static or potentially declining Crown research revenue. The GNS Science strategy has been to set ambitious commercial revenue growth targets as outlined in SCI, and its expectation is to meet those through a mix of domestic and international business. The plan to meet those targets is unclear to the panel but it appears to be a mix of consultancy and laboratory services (technology transfer) alongside some more 'commercialisation' prospects. GNS Science's strong reputation for good customer relationships and delivery is creating opportunities for some longer term partnerships that will support that aim.

The technology transfer activities within GNS Science appear to be well managed and the business development team works closely with divisions to find and support new work. However, it is unclear to the panel where significant growth in this business might come from other than through the addition of new staff, or by realigning research staff to spend more effort. This may result in lower productivity (more senior staff on low margin projects) and or non-delivery of crown science contracts, so careful attention will need to be paid to this option.

There is an expectation that there will be a significant growth in international work, although major commercial work in the past has been slow to come to fruition and has required sophisticated skills in negotiating across different political systems and jurisdictions. High margin revenue from this source may require different resourcing for greater growth, but it is likely to remain patchy and relatively high risk. Some of the long standing relationships, such as NZAid, are introducing more opportunities for GNS, but these will need to be considered with care to ensure they align with GNS Science's areas of strength and that there is sufficient margin to justify reallocation of resources.

GNS Science has a very small number of existing products that have been or are in the process of being commercialised. Three of those four products are software s9(2)(b)(ii)

The commercialisation expertise to achieve the greatest benefit for GNS Science and New Zealand is specialised and the panel considers that GNS Science does not have adequate access to such skills. The panel understands that government initiatives like Callaghan Innovation and Kiwinet have been set up to provide such support but neither have proved effective so far for GNS Science, although discussions have been held with Kiwinet. GNS Science sees a barrier in working with Callaghan Innovation with respect to the current government policy excluding greater than 50% CRI owned initiative obtaining TechNZ support. The panel encourages GNS Science to develop an explicit strategy for uncovering potentially valuable products and taking them to market with appropriate and skilled partners and adjusting its ownership position as necessary to do this.

s9(2)(b)(ii)

## 5.4. Working with Māori

GNS Science has huge potential to engage and deliver benefits for Māori with both a strong voice in the executive management and the focus of its key areas of research which suit the demands of the post-Treaty settlement environment. Māori will continue to grow in influence in New Zealand, especially in development and management of resources. GNS Science needs to urgently develop and implement a strategy to position for this future.

Rather than relying on a single individual, successful delivery of such a strategy will demand full commitment at all levels and active pursuit of partnerships of substance rather than just further MOUs.

s9(2)(b)(ii)

GNS Science has made initial steps in having senior level responsibility for this kind of strategic relationship, but in spite of best intentions current engagement appears to be mainly transactional. It is possible that GNS Science will need to invest for some period of time alongside iwi rather than wait for fully funded projects to be brought to the organisation. Co-investment may help build substantive relationships with the longevity needed to assist iwi to identify and manage their own resources.

At the same time it is likely that there is a need for GNS Science to invest to build its own capacity to engage effectively with Māori. The panel cannot be sure about this as ethnicity data were not available. The panel was told that there was a proposal developed in the last 2-3 years for investment in targeted Māori summer studentships, which could build towards graduate and post-graduate training. It is unfortunate that this proposal was not pursued as GNS Science could be further down this track and will now face competition and need to catch up with other CRIs who have been aggressively pursuing such strategies for several years.

Leadership for engagement with Māori needs to be modelled by the Board and chief executive. Other agencies with expertise, such as Te Papa and other CRIs, may provide useful guides to success.

## 5.5. External relationships

The panel met with some of GNS Science's key stakeholders over three days. The list of interviewees is attached as Annex 4. While this series of meetings was not intended to be comprehensive, the panel engaged with some of GNS Science's major stakeholders and some common themes emerged.

GNS Science is viewed as:

- open, honest, collaborative and helpful by almost all external stakeholders;
- not engaging in game playing, as some of its competitors are perceived to do, and as a result has attracted some key long-term partnerships;
- holding significant expertise in people who are strongly motivated to deliver benefit for New Zealand; and
- needing to continue to seek external challenge of its science and industry knowledge so that its deep knowledge in some areas does not get stale.

The panel understands that an external relations plan is in development to guide GNS Science in prioritising its engagement with a multitude of different stakeholders. Such a plan is essential to develop and implement urgently. There are some strategic partnerships (for example with some government agencies or iwi) that require a very different level of customer intimacy than (for example) consultancy

customers, international or research collaborators. The SCP provides some guidance to identifying and differentiating those different priority relationships.

### Working with government

The panel heard several examples of positive relationships which were initially developed through contracts and consultancy projects and that subsequently developed into much more mature engagements. Some relationships, such as that with EQC, have developed into formal, but flexible, arrangements and funding over ten years. Others, such as NZAid and LINZ, have established mutual trust and confidence in delivery that makes them open to forming more strategic partnerships. GNS Science may be underestimating the potential for more secure revenue from these well-established relationships.

*“Open the door and have a strategic conversation to build on the good existing stuff. Drive the relationships from the top as well as the bottom” (advice from a government department)*

This track record and reputation for effective public-public partnerships also demonstrates that there is considerable potential for New Zealand Petroleum and Minerals and GNS Science to reposition their recently fractious relationship into a more sophisticated engagement. The panel was pleased to see evidence of a more constructive approach from both parties to build such a partnership in future.

Several government agencies commented that there is a degree of naivety in GNS Science about engaging with government and in understanding some of the processes and drivers affecting their decision making processes. While GNS Science understands and interacts frequently with MBIE SSI processes, a different approach and understanding is needed for long-term government partnerships.

### Research partnerships

GNS Science has some strong collaborations through major international project teams such as ANDRILL and the Alpine Fault Drilling Programme, and its research is highly regarded internationally. Many GNS Science researchers are technical contributors to major international agreements (such as the Intergovernmental Panel on Climate Change) and there are research partnerships with a large number of international research and public good organisations (such as the US Geological Survey).

*“GNS has world-leading researchers as the norm” (comment from a university)*

The NHRP has been an important mechanism to move some of GNS Science’s research relationships to a more collaborative arrangement. Universities respect the high quality research undertaken by GNS Science, although those outside the ‘Parties’ to the NHRP feel less engaged (refer to 5.7.3 below).

Beyond the NHRP, collaboration with New Zealand research organisations seems to operate well at a researcher level. The National Isotope Centre (NIC) works closely with the MacDiarmid Institute and owns facilities, such as the Ice Core facility, which it makes available to collaborating institutions. Some commentators noted competitive tensions with one other CRI, which may be impeding GNS Science’s ability to deliver more strongly on important issues such as optimisation of our land and water resources.

### Commercial contracting

Companies that have engaged GNS Science to provide technical expertise were complimentary about their commitment and deep expertise. In some instances, the long-term relationships allowed them to by-pass formal contracting processes to get the information they needed, and there was considerable respect for GNS Science’s ability to manage security and commercial sensitivity of information held on

behalf of competing clients. GNS Science's ability to manage these issues well was seen as part of its competitive advantage since it has a good overview of the breadth of work in New Zealand.

*"You have to admire the enthusiasm their scientists have, but sometimes you have to put the brakes on them a bit" (advice from industry).*

*"Look after the people, they are good. They are not looking to goof off or hide from application. They perform best when not interfered with" (advice from industry).*

### Public outreach

Amongst CRIs, GNS Science has probably the most significant public outreach activity, particularly through its GeoNet and Te Papa partnerships. It is a trusted advisor on current issues, especially hazards, and several GNS Science staff are experienced science communicators. This activity is not specifically funded and is somewhat dependent on the passion and expertise of its key staff, but its value should not be underestimated. In the last five years, GNS Science has also employed a professional teacher as an Educational Outreach Officer and the 'learning pages' on its public website are its most frequently visited pages.

GNS Science has a long standing and positive partnership with Te Papa and this is an effective conduit for public education about topical earth sciences issues. The panel heard that GNS Science is flexible and innovative in its interactions with Te Papa, and it does this with very limited resources (two part-time scientists). This partnership provides significant brand exposure for GNS Science and it will be important to keep that fresh through contributing GNS Science experts to important and topical debates and exhibitions.

## 5.6. Culture and people development

The 2012 staff survey highlights that GNS Science staff are proud to work for the organisation and there is a strong sense of commitment towards being part of a research organisation whose *"prime goal is the economic well being and resilience of New Zealand"* (young staff member). There is also a strong team culture, which is evident in the survey and in all the interviews we conducted. Most people, but especially the younger staff, were clear that they choose to work at GNS Science ahead of alternatives such as academia or industry.

*"The science we do is not just a bunch of academic stuff – it is valuable, and not just in dollar terms" (researcher).*

The staff survey notes a flexible, friendly and supportive culture for which we commend the past leadership.

There is also a hunger in the organisation for *"a stronger, revitalised and inspirational management, with a clear vision for the future and appropriate business disciplines to achieve its potential"* (staff member).

The panel considers that addressing the following issues will help achieve that goal:

### Executive management

One of the strongest themes the panel heard in discussion, and in the staff survey, was that there is a disjunct between staff and the executive management. There was perceived to be lack of communication and a lack of leadership and direction.

Since the survey a new Chief Executive has been appointed. It is clear to the panel that one of the new CEO's first challenges is to ensure the executive management operates as a team rather than a collection of individuals.

Reform of the executive management is an urgent task. It is large (12) and lacking coherence. In other similar organisations there are smaller teams which cover roles such as research, operations, strategy, and corporate. The panel encourages GNS Science to simplify the top tier and lead by example in forming a high performing team.

### The tension between research and commercial

In several documents and in discussion the panel heard concern expressed about the expectation that researchers need to do both 'research' (government funded) and 'commercial' work (paid by industry, regional councils etc). This expectation exists in all CRIs and many other research organisations but seems exaggerated within GNS Science. In part this may be exacerbated by the somewhat artificial separation of 'research' being aligned with MBIE and Marsden funding with all other activity being termed 'technology transfer'. The panel believes at least some of the 'technology transfer' activity must involve research, even if it is more applied and that the repeated articulation of such a separation is not helpful.

In discussion with some research staff it was clear that some found working with paying clients rewarding because they saw the application of their work, and they got ideas about how and where to take their research to a new level. For those people who show an interest and business aptitude it may be useful to put in place a programme of business skill development and/or secondments (e.g. to Callaghan Innovation or enterprises).

The panel also heard that some people recruited as researchers later found that their work involved a lot of routine and tedious 'commercial work', such as processing samples. These people became frustrated and some chose to move to industry and be paid more to do such work. This suggests that it is less the nature of the work than the need to provide an appropriate balance of stimulating work. Other research organisations will be able to share experience on how best to manage this balance, but the panel was of the view that in general GNS Science is managing the balance well.

### Diversity and innovation

Diversity in perspective and experience is a valuable contributor to creating a vibrant and innovative organisation. The panel notes that gender diversity statistics were available, but other diversity statistics were not.

The executive management has very low levels of diversity and a stronger, revitalised and inspirational management will be difficult to achieve without new and different perspectives. Within the organisation there is a growing number of women leaders and below the age of about 50 the number of male and female researchers is fairly even. This has been a positive development over the past five to ten years.

As already noted there were no data available on ethnicity; the lack of data will make it difficult for GNS Science to monitor and assess its effectiveness in building capability to engage with Māori. The panel asked whether the topic of diversity was discussed at senior levels (including the board) but little information was available.

The panel observed an appetite for improving the performance of the organisation in almost all the discussions we had with staff. There was frustration amongst staff that there is no vehicle for their ideas

and energy and we saw some 'learned helplessness'. With probing, people were able to identify potential improvements in their own area but thought they could not '*get it past executive management*'. The panel encourages the new Chief Executive to find some creative ways to unleash the ideas for GNS Science to be a top performing organisation.

*"There is not an expansive visionary mind-set here" (researcher).*

*"The mind-set is that there is no money so ideas get stillborn" (researcher).*

## Turnover

The relatively low overall staff turnover rate at GNS Science (6.5% in 2013) reflects a period of stability and increased funding over the past 5-10 years. [s9\(2\)\(b\)\(ii\)](#)

In some of these areas long standing and key staff members have been attracted to much higher industry salaries or greater career prospects while others have been the result of planned turnover. The panel understands that the Board has considered such matters but the panel was not able to access the relevant papers.

The panel heard that secondments to industry have taken place in the past and initiatives like this, along with other mechanisms to strengthen industry interaction may need to be enhanced.

## 5.7. Other issues

### 5.7.1. Core-funding allocation

GNS Science receives a significant amount (\$27m p.a.) of devolved MBIE investment (Core Funding) as a result of the implementation of the CRI reforms. Internally to GNS Science, this funding is termed Direct Crown Funding (DCF). A substantial proportion of this funding is aligned to the Natural Hazards Research Platform (over \$10m p.a.). This investment, alongside Core investment from NIWA, is managed through the NHRP governance and advisory arrangements. While it may be possible for GNS Science to reallocate these funds outside the NHRP, it would require considerable negotiation with the other partners and discussion with the Platform Advisory Groups.

Of its remaining Core investment, GNS Science has so far retained the relative proportions of legacy investments into individual research areas with some renaming of Databases and Collections funds and alignment of their management within relevant programmers. The panel is supportive of the small (10% of total Core) internally competitive new initiatives fund (the Strategic Development Fund). It would be useful to increase its scale and deliberately address the need for 'pipeline' management.

The panel is pleased to see that GNS Science has undertaken a robust 'health-check' of all Core funded research and is reassured that the science being undertaken is of high quality and delivering to its milestones. As would be expected in any area of research there has been some incremental evolution of the research in the 2-3 years since the inception of Core Funding, but these have been driven by the science teams rather than on the basis of strategic organisational priorities.

The global state of scientific knowledge is cited as a key driver of Core investment in the latest SCI (p6) together with advice from external advisory panels. The panel found little interest from members of the executive management in considering re-prioritising or re-direction of Core investment amongst the programmers of research in order to ensure a focus on better delivery of outcomes and impacts for New

Zealand. Several times the comment was made by senior and mid-tier management that such an approach would require ‘robbing Peter to pay Paul’. New investment from other sources is seen as the only mechanism by which proportional investment across GNS Science could change positively.

One member of the executive management stated that he ‘had no idea’ how to undertake an analysis to support (or discount) such a reprioritisation. A paper has been developed with some approaches and criteria outlined but that approach has not yet progressed. Also discounted by management was sourcing and redistribution of some proportion of Core investment from areas of science which have experienced considerable increases in non-Core investment over the last 2-3 years and which also have significant Core investment. Such redistribution was viewed as being a disincentive to those programmes and managers continuing to grow new revenue.

While the panel has no view as to whether any redirection of Core investment is appropriate, or necessary, it does believe that the current balance should be actively and carefully considered against a robust organisational strategy. As discussed in the next section, GNS Science is only starting to consider approaches to quantitative impact analysis (economic, social, and/or environmental). It should combine such understanding alongside analysis of end-user priorities to ensure that its investment of Core funds is appropriate. Without such tools, it will be difficult for GNS Science to confirm the robustness of the existing mix of Core investment or effectively manage any changes in priority which may be needed. This is an area where sharing processes with other CRIs may be advantageous.

### 5.7.2. Impact assessment

In meeting its obligations with respect to impact analysis, GNS Science has relied, until very recently, on small case studies and anecdotal evidence such as that provided in recent annual reports. The panel was referred to such evidence in the material provided to it. It appears the previous leadership felt it was impossible to make quantitative measures of the impact of its research for New Zealand. The Outlook letter for 2013/14 from the Minister reiterated the ownership expectations around progress in articulating and measuring economic and environmental impacts.

The panel recognises the difficulties in attempting such analyses. These include attribution issues, lag times from research to actual impact and the information gaps often evident after uptake of GNS Science research outputs by a next-user together with the ultimate impact created by an end user. However, making robust decisions around priority investments, especially Core investments, requires an understanding of the impact that those investments will have. In turn, starting the process of thinking through impacts should provide some insights as to the quality of Core investment planning and delivery on strategy.

The panel notes the recent initiative by GNS Science, in partnership with other like CRIs, contracting an economic consultancy to develop an approach over the next few months. Such an approach will need careful selection of target areas of research and perhaps a pilot process and so will not be rapidly implemented. The panel believes that some of the outcome areas (eg around the Canterbury earthquakes) lend themselves readily to high-level cost-benefit analysis which are likely to more than demonstrate a return on investment for the shareholder. This is another area where some other CRIs are quite well advanced and where other agencies such NZAid, which routinely undertake such impact analysis could well provide useful tools.



### 5.7.3. Natural Hazards Research Platform

The NHRP is a significant partnership of CRIs, universities and a commercial organisation focused on Natural Hazards research. The NHRP was established in 2009. GNS Science is the 'host' organisation providing operational support and managing the investment funds from MBIE. GNS Science has a significant proportion of its Core funds directed into the NHRP alongside those of NIWA. Since establishment the NHRP appears to have been well managed and very effective in creating a single communication voice throughout the Christchurch earthquakes and other events such as the Tongariro eruption.

The governance, management and advisory structure established for the NHRP is complex and perhaps a reflection of the difficulty in establishing this new approach to Crown investment at the time. The attention of GNS Science's Board appears to have been primarily on contracting and compliance. No issues have been raised to the 'CEO group' for dispute resolution, which suggests that the management and advisory processes are working effectively. Both the Platform Manager and members of the advisory group commented that the pressure of responding to the Christchurch earthquakes bedded the partnerships in more quickly and firmly than otherwise would have happened. All those involved with the NHRP whom the panel spoke to were very positive about its current performance and cohesion.

That said, there was some indication of feelings that there is a 'first tier' and 'second tier' set of relationships with the parties to the formal partnership having undue influence on direction of research and its funding. At the same time, there is some feeling that the management is overly risk averse in the application of new ideas or approaches to the overall research programme. There is also some negative comment from organisations who initially chose not to partner into the platform. The panel understands that there have been moves towards greater inclusiveness with extensive contracting to 'non-partners' and discussions building towards the 'Resilience' National Science Challenge (NSC) .

The panel understands that the NHRP could be the model for a broader national partnership as the 'Resilience' NSC. Indeed, the NHRP and GNS Science believe they will be the structure for such broader investment and alignment. The panel is comfortable that this is a sensible approach as long as:

- the parties not currently party to the NHRP are genuinely engaged with;
- the management structure better encompasses the views of all those providing research (formal partners and subcontractors); and
- there is a deliberate strategy to encompass innovative research ideas on the edge of the core delivery of the platform.

### 5.7.4. Open data

GNS Science has a strong track record of delivering on the government's open data agenda through its partnership with EQC in GeoNet. This has been particularly positive because of the clarity provided in its initial partnership agreement. GNS Science is enhancing its delivery of on-line products such as QMAP and GeoNet has to be commended for its response to public expectations of more interaction via social media. The current GNS Science Data and Collections policy commits to endeavoring to make scientific databases publicly available with caveats around charging access fees to cover costs of access, 3<sup>rd</sup> party confidentiality and business purposes. GNS Science is in discussion with other CRIs as to how to advance further in delivering the open data agenda.

The government's expectation that all data are delivered on line and in near real time needs further clarification: while raw data can be easily provided, it is in the processing, interpretation, modelling and

visualisation of such data that much of the value lies. For example, the value chain for seismological (earthquake) data is very different from seismic data (for petroleum exploration) so GNS Science will need to negotiate these expectations with government on a case-by-case basis. In some cases the value to New Zealand may be optimised by GNS Science being able to enhance the data (and charge for that) but this should not be a defence for restricting access to publicly funded data. Expectations of timeliness in making data publicly available should acknowledge the value and rigour of scientific publication of results in some cases.

## 6. OPPORTUNITIES AND BARRIERS

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Looking ahead, GNS Science has numerous opportunities that will enable it to enhance its delivery to its SCP. Many of these opportunities can also be regarded as barriers. The panel has sought to classify opportunities as those factors directly within the control of the organisation while barriers are more external to its control. Such opportunities include:

### 1. Clarity of strategy and its leadership

Although the SCI provides a focus for GNS Science, the panel is of the view that an aspirational strategy for the next several years would provide considerable benefit to senior management and staff and external stakeholders.

### 2. Ownership of medium-term financial targets and commercialisation strategies

If all senior management are focused on the medium term financial targets, and their own and team contributions to achieving them, the risks around achieving these stretch targets will be considerably reduced. The panel believes that moving management incentive structures beyond individual performance to that of the organisation as a whole would be helpful.

### 3. Improving organisational performance

There are a number of areas of organisational practice where the panel believes that improvements could be made. In particular, through structured account management and more effective and active management of the matrix across the research teams in order to reduce silos. While GNS Science currently measures itself against other CRIs in terms of understanding its performance, the panel believes GNS is at a stage where it could set more ambitious global benchmarks of best-practice to establish a high performance culture.

### 4. Building organisational energy, drive and aspiration

There is a discernible hunger from staff as indicated in both the recent climate survey and in panel discussions for GNS Science to better support innovation across the company. A focus on building high performing teams at all levels, but with a particular focus on leadership development of senior management, would help engender such an environment. At the same time, the panel encourages enhancing mechanisms for seeking new ideas beyond the basic science supported by the Marsden fund and extending the development of promising opportunities along the delivery chain. In other words, identifying and delivering the next 'Claritas' opportunities rather than focusing on existing knowledge and intellectual property.

### 5. Building substantive partnerships with Māori

The outcome areas to which GNS Science delivers align tightly with those where Māori can be expected to have significant influence in development and management of natural resources in the post-Treaty settlement environment. There is very significant opportunity to build partnerships which would provide GNS with a powerful external voice of support in its delivery of outcomes essential to the future prosperity of New Zealand.

Some important barriers GNS Science faces are noted below, though the panel has not identified any showstoppers to future progress by GNS Science:

### 1. Risk aversion

There is a risk-averse culture inherent in most government-owned enterprises, which creates a difficult environment for an innovative, flexible and nimble research organisation.

### 2. Lack of clarity of ownership messages

There are sometimes contradictory signals created by the ownership structure for CRIs. Two examples which particularly affect GNS Science are:

- drivers around the commercialisation of intellectual property. The CRI Taskforce recommendation, endorsed by the government, supported moving intellectual property from the CRIs' balance sheet as soon as possible and discouraged investment in commercialisation activities to maximise returns. However, they are also getting the message that the Minister is seeking greater risk appetite from the CRIs in order to accelerate economic development; and
- ownership expectations asking for open access data while also seeking a robust return on equity, which is driven in part by technology transfer and commercialisation revenue.

## 7. CONCLUSIONS

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This four year rolling review of GNS Science has identified many positive features within the organisation including its good policies, processes, systems and structures; very strong science, with some world-leading; and effective relationships with its key stakeholders and commitment to its purpose throughout the organisation.

GNS Science is just emerging from a long period of leadership stability, which may have moved the organisation towards a lower risk appetite. At the same time, the last few years have provided both new research investment and focus as a result of earthquakes, volcanic activity and the government focus on mining New Zealand's natural resources. GNS Science is highly relevant to delivering what the public and its owners require from a CRI with a strong and respected brand. The appointment of the new CEO provides the opportunity for a significant refresh of strategy, style and some management. The panel believes that the need to implement this refresh is pressing.

Financial performance control over the last four years has been good, though non-Crown revenue has been 'lumpy', especially from off-shore sources. There is some feeling amongst staff that the controls are a brake on innovation, but this is able to be remedied given the robust balance sheet, if the strategic drivers support such a move. Embedding tighter business practices, including disciplined account management and less *ad hoc* matrix management, will drive energy and focus across the organisation. At the same time, articulation of a clear strategy will support priority setting and focused distribution of Core research investment.

The panel has concerns about the general operating environment for all the CRIs, in particular the sometimes contradictory signals that the ownership and monitoring structures deliver, especially those around the appetite for risk.

The panel expects that GNS Science will respond positively to this review. If it does, and if it delivers on a robust action plan, the panel believes the company will continue to flourish. This will allow the company to leverage new opportunities, such as the National Science Challenges, and build its national and international standing as a research organisation delivering value to New Zealand.

### Annex 1: SCP for GNS Science

#### **Purpose**

GNS Science's purpose is to undertake research that drives innovation and economic growth in New Zealand's geologically-based energy and minerals industries, that develops industrial and environmental applications of nuclear science, that increases New Zealand's resilience to natural hazards and that enhances understanding of geological and earth-system processes.

#### **Outcomes**

GNS Science will fulfil its purpose through the provision of research and transfer of technology and knowledge in partnership with key stakeholders, including industry, government and Māori, to:

- increase resource security and economic benefit from the development and diversification of New Zealand's oil, gas, geothermal energy and minerals industries
- increase New Zealand's resilience to natural hazards and reduce risk from earthquakes, volcanoes, landslides and tsunamis
- improve the sustainable management of and increase economic returns from groundwater resources
- create value for New Zealand industry through the use of isotope and ion beam technologies
- increase understanding of the geology and past climates of New Zealand, the Ross Dependency and Antarctica
- enhance the geotechnical engineering that underpins New Zealand's transport and energy infrastructure.

#### **Scope of operation**

To achieve these outcomes, GNS Science is the lead CRI in the following areas:

- geothermal energy, oil, gas, gas-hydrates (including carbon sequestration)
- mineral and geobiological resources
- geological hazards, risk mitigation and societal impacts of natural hazards
- earth-system processes and landscape evolution
- groundwater processes and quality
- the geological component of global environmental processes and climate change
- application of nuclear and isotope science and ion beam technology.

GNS Science will work with other research providers and end-users to contribute to the development of the following areas:

- high-value manufacturing
- freshwater management
- hazards management

- ocean floor exploration
- climate change adaptation and mitigation
- Antarctica.

## **Operating principles**

GNS Science will:

- operate in accordance with a statement of corporate intent and business plan that describes how GNS Science will deliver against this SCP, and describes what the shareholders will receive for their investment
- meet its obligations as a Crown Company and remain financially viable, delivering an appropriate rate of return on equity
- develop strong, long-term partnerships with key stakeholders, including industry, government and Māori, and work with them to set research priorities that are well linked to the needs and potential of its end-users
- maintain a balance of research that both provides for the near-term requirements of its sectors and demonstrates vision for their longer-term benefit
- transfer technology and knowledge from domestic and international sources to key New Zealand stakeholders, including industry, government and Māori
- develop collaborative relationships with other CRIs, universities and other research institutions (within New Zealand and internationally) to form the best teams to deliver its core purpose
- provide advice on matters of its expertise to the Crown
- represent New Zealand's interests on behalf of the Crown through contribution to science diplomacy, international scientific issues and/or bodies as required
- seek advice from scientific and user advisory panels to help ensure the quality and relevance of its research
- establish policies, practices and a culture that optimise talent recruitment and retention
- enable the innovation potential of Māori knowledge, resources and people
- maintain its databases, collections and infrastructure and manage the scientific and research data it generates in a sustainable manner, providing appropriate access and maximising the reusability of data sets
- seek shareholder consent for significant activity beyond its scope of operation.

This statement provides key guidance to the GNS Science board for developing its statement of corporate intent, which sets out GNS Science's strategy for delivering against its core purpose. GNS Science's performance will be monitored against the outcomes and operating principles in this statement

## Annex 2: Brief biographies of the members of the review panel

### *Philip Barry (panel Chair)*

Philip Barry is a founding Director of TDB Advisory Ltd, a boutique corporate advisory company. Phil has widespread and in-depth expertise in corporate finance, economics, public policy analysis and regulatory reform.

Phil has chaired a number of taskforces and reviews in recent years, including the Parliamentary Appropriations Review Committee; the government's Technical Advisory Group on Air Quality Standards, an independent business stock-take of IRL and the first four-year rolling review of a Crown Research Institute, that of Plant and Food Research. He also acted as lead consultant for MBIE on the recent CRI Balance Sheet Review. As a former Director at the Treasury and Advisor at the Department of the Prime Minister and Cabinet, Phil provided strategic advice and led the implementation of structural change and regulatory reform in several parts of the New Zealand economy. During the mid-1990s, Phil served as Counsellor Economic in New Zealand's Permanent Delegation to the OECD in Paris.

Phil has an MBA in Finance and Accounting from the University of Rochester, New York (where he awarded membership of Beta Gamma Sigma) and a BA Hons (1st class) in Economics from Victoria University, Wellington. He is a NZ National Research Council, Reserve Bank and Fulbright Fellowship Holder.

### *Helen Anderson*

Helen Anderson is a director of DairyNZ, NIWA, Chair of Fulbright NZ and Chair of BRANZ. She chairs external advisory committees for the Department of Internal Affairs and LINZ and is involved in other advisory committees in the science, education and construction sectors. She has contributed to numerous technical reviews including the Defence Technology Agency, and the Christchurch CBD building collapse inquiry.

Helen was Chief Executive of the Ministry of Research, Science and Technology for six years and before that was MoRST's Chief Scientific Adviser for more than five years. She led a research partnership between the University of Otago and GNS for 3 years and before that was a scientist at GNS and its predecessor DSIR Geophysics Division. Helen has a PhD in seismology from Cambridge University and is a Companion of The Queen's Service Order, Companion of the Royal Society of New Zealand and Companion of the Institute of Professional Engineers of New Zealand.

### *Allan Freeth*

Allan Freeth has held senior executive positions at Trust Bank, was Chief Executive and Managing Director of Wrightson, and Chief Executive Officer of TelstraClear from 2005 to 2013.

He gained his Philosophy Doctorate in Population Genetics through the Australian National University in Canberra, and holds a Bachelor of Science (Hons) from Canterbury University and an MBA with Distinction.



He is presently Chairman of Housing New Zealand Corporation and Downstage Theatre, Deputy Chairman of Film New Zealand, and a Trustee of Crimestoppers New Zealand and the Malaghan Institute of Medical Research.

He was a Member of the Global Agenda Council of the World Economic Forum on Next Generation, and past directorships include Genesis Research and Development, GNS Science, Save the Children International, Save the Children Australia, the Advisory Boards of TelstraClear and the New Zealand Treasury. He has served as Chairman of Save the Children New Zealand, Chairman of the Board of Governors of Queen Margaret College, a leading independent girls' school in Wellington, and was also a Trustee of the Massey Agricultural Research Fund.

*Tricia Harris*

Tricia Harris was the Chief Science Advisor at the Foundation for Research Science and Technology (2004 – 2008). Since then she has worked as a consultant in a range of consultancy roles, including work on the IRL stock-take, the CRI Balance Sheet Review, as a panel member of the 4 year rolling review of Plant and Food Research and as Chair of Partnership Proposal review Panels for MBIE.

Tricia completed her PhD in Animal Nutrition at Cambridge University and returned to New Zealand at DSIR (later AgResearch) and for 20 years was a research scientist, then research group leader. In 1997 she was appointed Group Manager, Science at AgResearch where she had responsibility for strategic planning, together with implementation and review of company innovation policy. She also had a range external roles including Commissioner on the Tertiary Education Advisory commission. In 2005 Tricia was awarded the ONZM (Officer of the New Zealand Order of Merit) for Services to Science.

## Annex 3: List of information provided to the panel

<b>DOCUMENT / INFORMATION</b>
<b>A. Understanding the business</b>
1. Statement of Core Purpose
2. Statement of Corporate Intent
3. Copies of the detailed workings for the 5 year SCI Budget
4. Annual Reports
5. Quarterly and six-monthly reports
6. YE management accounts for the past 3 years and any reconciliation to the year-end financial statements.
7. GNS Balance Sheet Review
8. GNS Stakeholder Survey 2012 and 2013
9. Key Stakeholders list
10. GNS Organisation Charts
<b>B. Business structure overview</b>
1. A brief memo providing an overview of each of GNS's business units, the activities undertaken, their capabilities (including technological platforms and R&D specialisations) and the market(s) that they serve.
2. A brief memo providing an overview of each of GNS's subsidiaries, associates and JVs with a brief description of the activities undertaken, GNS's equity stake (%), revenue (\$) and assets (\$) and governance.
3. For each business unit, subsidiary, associate and JV a brief memo on:
a. what resources are engaged in core science?
b. what resources are engaged in applied research? and
c. an estimate of the % of the entity's resources devoted to each of the above two categories.
<b>C. Management accounting process</b>
1. A copy of the last review of the company's financial systems
2. A copy of the latest review of the company's computer systems.
<b>D. Historic management accounts</b>
1. A breakdown of GNS revenue for the last 5 years by business unit and location including the following revenue categories.
i. from non-MSI Central Govt
ii. from other CRI / Universities / Local govt
iii. commercial (NZ) [please provide a breakdown by customer and location]

<b>DOCUMENT / INFORMATION</b>
iv. commercial (int'l) [please provide a breakdown by customer and location]
v. IP income [with additional notes breaking this down as appropriate]
vi. other [with additional notes breaking this down as appropriate]
2. A contracted revenue maturity profile breakdown.
3. Expenditure trends for the last 5 years by major categories of expenditure.
4. Detail of capital injections from and distributions to the Crown have been made over GNS life (dates and \$ amounts).
5. Details on the realignment of GNS Core Funding.
<b>E. Forecasts</b>
1. Latest forecasts of revenue for the next 5 years broken down into the categories in D1 above.
2. What are the key assumptions underlying the above forecasts?
<b>F. Investments</b>
1. A list of planned Capex and other investments (type and \$ amount) for each of the next five years.
2. IP Register & valuations
3. Current value of assets
<b>G. Key governance documents</b>
1. A copy of any strategic reviews undertaken of GNS in the last five years.
2. A copy of the risk register.
3. A copy of the legal register.
4. Details of the Board self-assessment process.
5. Details of strategic planning days.
<b>H. Personnel</b>
1. A headcount breakdown by location and type (management, basic science, engineering, support staff).
2. Detail of areas of science and engineering specialisation and excellence.
3. The annual turnover rate of professional staff for the last 5 years by group.
4. A bell curve of the years since graduation for all professional staff.
5. A breakdown of the term (years) to retirement of professional staff.
6. Information on current industrial disputes if any.
7. Information on redundancy agreements.
8. Succession planning documents.
9. Details of the processes in place within universities in regards to recruiting PhDs and how these are managed.

<b>DOCUMENT / INFORMATION</b>
10. Staff satisfaction survey results.
11. Benchmarks of GNS salaries against comparable institutions.
12. Staff management strategies around managing changing priorities and staff development.
13. Utilisation Rates of staff across the organisation
<b>I. Outcomes</b>
1. Paper stating the key desired outcomes of the government that GNS is contributing to and the evidence available that GNS outputs are having a significant effect on the desired outcomes.
2. Documents reporting on the assessment of outcomes; reviews or evaluations of outcomes.
3. Reviews evaluating how contracts are managed overall both internally and externally.
4. Senior management response to reviews undertaking – including details of what management has learnt from these reviews and taken forward.
5. Measurements of how well GNS is monitoring, measuring and improving its science quality.
6. Case studies of GNS projects.
7. End of programme reviews (and mid-programme reviews).
<b>J. KPIs</b>
1. Internal KPIs that are not published but provided internally to the Board and senior management.
2. Studies around GNS's contribution to economic growth.
3. Time series of KPI's
<b>K. MBIE documents</b>
1. Report of the CRI Taskforce
2. MBIE Vision Matauranga
3. GNS bidding history
4. 2013 Letter of expectations from Minister
<b>L. Additional documents requested by the panel</b>
1. Summary of international sector partnerships
2. panel Reports on Science Reviews for last two years
3. Data use and access policy
4. Hazards Platform Review Terms of Reference (draft)
5. Charter for the Board
6. Terms of Reference for:
a. Audit and Risk Committee

<b>DOCUMENT / INFORMATION</b>
b. Remuneration Subcommittee
c. Health, Safety and Environment Committee (draft)
d. Board commitment and role with regard to Health and Safety
7. Job descriptions of the Management Team
a. Chief Financial Officer / Company Secretary
b. General Manager, Human Resources
c. General Manager, Business Development
d. General Manager, Information Services
e. General Manager, Maori Strategy
f. General Manager Strategy
g. Director Research
h. Director, National Isotope Centre
i. Director, Natural Resources
j. Director Natural Hazards
k. Director, Natural Hazards Platform Manager
l. General Counsel
8. International case for New Zealand participation in the International Ocean Discovery Program (IODP)
a. Business case, 18 August 2011
b. Value proposition, June 2013
c. Concept proposal
9. Natural Hazards Platform Partnering Agreement
10. Presentations at GNS 22-24 October
a. Slides from Chair
b. Slides from CEO
c. Slides from Kelvin Berryman
d. Slides from Terry Webb
e. Document from Ian Graham
f. Natural Hazards Platform finances
g. Graphs from Des Darby
h. Strategy from Chair

<b>DOCUMENT / INFORMATION</b>
i. Slides from Kevin Faure
j. Slides from Chris Daughney with notes on collaboration
k. Māori strategy from Rawiri Faulkner
11. Latest strategic issues letter to Ministers Joyce and Coleman
12. Diversity statistics
a. Age and gender
b. Turnover by department
c. NZ Legislation: Crown research Institutes Act 1992 (Sect 5) and Crown Entities Act 2004 (Sect 118)
d. Recruitment Quick Reference Guide
e. Recruitment procedure
f. Equal Employment Opportunity procedure
g. Exit interview information (by email)
13. Commercialisation/ stakeholders
a. Commercialisation at GNS Science (Aug 2013)
b. Commercialisation of science within GNS Science (Nov 2012)
c. Improving the Stakeholder Interface - Assessing the current state of relationships
14. Financial data
a. Financials, SCI data, cross-CRI, long run revenue
15. Overhead activities: outreach and graduate student support
16. Papers provided but stayed on-site at GNS
a. Agenda and minutes of Board meetings for the last 2 years
b. CEO reports for the last 2 years
c. 2013/14 Board paper on Capex
d. Three business papers that went to the Board for Capex (selected from last 12 months)
e. Board summary paper on Claritas
f. Claire McGowan's paper to the Strategy Planning day last year titled 'Review of GNS's commercial activities'
g. Staff turnover stratified for age, gender, ethnicity at different organisational levels

## Annex 4: Stakeholders whom the panel met with or spoke to

Meeting	Position
<b>M. 22-24 October 2013 at GNS (Avalon or Gracefield), Wellington</b>	
s9(2)(a)	CEO
	Chair
	GM Strategy
	Chief Financial Officer / Company Secretary
	GM Human Resources
	GM Business Development
	GM Maori Strategy
	Director Research
	Director, National Isotope Centre
	Director, Geological Resources
	Director Natural Hazards
	Director, Natural Hazards Platform Manager
	Small group departmental leaders
	Small group younger staff
	Legal Counsel
	Programme Leaders
<b>N. 4, 5 or 8 November 2013 at MBIE Wellington (meeting or phone)</b>	
s9(2)(a)	NZOG
	Hazards Platform Strategic Advisory Group
	Science Investment, MBIE
	International, MBIE
	Māori, MBIE
	Tuwharetoa Māori Trust Board

Meeting	Position
s9(2)(a)	NZ Petroleum & Minerals
	Hazards Platform Management Group
	GreenButton
	MFAT (NZ Aid)
	Contact
	LINZ
	Chair/ Deputy Chair GNS
	GNS
	EQC
	University of Otago
	Te Papa
<b>O. 19 November 2013 at GNS Wairakei</b>	
s9(2)(a)	HoD Geothermal Sciences
	Human Resources Manager, Wairakei
	Manager Geothermal Analytical Laboratory
	Extremophile research leader
<b>P. 20 November 2013 at GNS Wairakei</b>	
s9(2)(a)	



## GNS Science Four Year Rolling Review:

### Addendum to the Panel report of 6<sup>th</sup> December

#### Open data access

As outlined in Section 5.7.4 of the full report, GNS Science has a strong track record of delivering on the government's open data agenda through its partnership with EQC in GeoNet and has been enhancing its delivery of on-line products such as QMAP.

In reaching its conclusions the panel stated:

*“There are sometimes contradictory signals created by the ownership structure for CRIs. Two examples which particularly affect GNS Science are.....:*

- *ownership expectations asking for open access data while also seeking a robust return on equity, which is driven in part by technology transfer and commercialisation revenue.”*

This comment reflected the discussions the panel had with GNS Science executive management and the way in which GNS Science saw trade-offs they needed to make in meeting government expectations as covered by NZ GOAL (refer Annex 1).

The current GNS Science Data and Collections policy commits to endeavouring to make scientific databases publicly available with caveats around charging access fees to cover costs of access, 3<sup>rd</sup> party confidentiality and business purposes and so commits to meeting the expectations and restrictions of NZ GOAL.

The panel's understanding is that the trade-off issue is primarily one of timing of the release of data for re-use by other parties, especially consultancy services in the same fields as GNS Science in technology transfer advice.

Restriction 29 (c) allows retention of data for GNS Science's *“own legitimate commercial interests or business model”*. The issue at stake is the ability of GNS Science to hold-back release of data while it prepares to add value through packaging of the raw data to meet target client requirements (as well as permitting publication as original work in some cases). GNS Science views such packaging as central to its ability to maintain its position as a provider of choice to its key commercial stakeholders.

A round table discussion by MBIE officials and GNS Science working systematically through both the expectations and restrictions may well clarify what the panel took to be contradictory signals and help resolve what has been a long-standing concern for not just GNS Science but some other CRIs.

## Annex 1

Open data access is covered by NZ GOAL, of which CRIs and universities will be included <http://ict.govt.nz/guidance-and-resources/information-and-data/nzgoal/quick-guide-agencies/>.

There are clauses for appropriate restrictions <http://ict.govt.nz/guidance-and-resources/information-and-data/nzgoal/read-nzgoal/>.

### Open access to copyright works with Creative Commons Attribution (BY) licence as default

26 Unless a restriction in paragraph 29 applies, State Services agencies should make their copyright works which are or may be of interest or use to people available for re-use on the most open of licensing terms available within NZGOAL (the **Open Licensing Principle**).<sup>6</sup> To the greatest extent practicable, such works should be made available online. The most open of licensing terms available within NZGOAL is the Creative Commons Attribution (BY) licence.

### Restrictions

29 Neither the Open Licensing Principle nor the Open Access Principle applies where licensing a copyright work with the Creative Commons Attribution (BY) licence (in the case of copyright works) or providing open access to and allowing re-use of other material (in the case of non-copyright material) would:

- (a) be contrary to legislation, court order or specific government policy;
- (b) constitute a breach of contract, breach of confidence, breach of privacy, disclosure of a trade secret or other actionable wrong;
- (c) be contrary to an agency's own legitimate commercial interests or business model (such as Standards New Zealand's charging for standards);<sup>8</sup>
- (d) result in the publication of a patentable invention for which the agency proposes or may wish to apply for a patent;<sup>9</sup>
- (e) be contrary to the public interest, where it exists, in having a single, authoritative and non-adapted version of a specific data source;
- (f) result in the release of an incomplete work or incomplete material where the agency considers, acting reasonably, that:
  - (i) such release would be:<sup>10</sup>
    - materially misleading; or
    - likely to cause or contribute to material error on the part of recipients or licensees; and
  - (ii) such risks could not be adequately mitigated by the use of disclaimers or other statements at the point of release and/or within the work or material regarding the incompleteness of the work or material;
- (g) threaten the control over and/or integrity of Maori or other traditional knowledge or other culturally sensitive material;
- (h) jeopardise the economic or other potential to Maori or other indigenous groups of Maori or other traditional knowledge or other culturally sensitive material;<sup>11</sup> or
- (i) otherwise conflict with the existence of a good reason under sections 6, 7 or 9 of the Official Information Act for withholding release of the work or material if the work or material were requested under that Act.