REALISE THE OPPORTUNITY

2017–2022

NATIONAL MINERAL EXPLORATION STRATEGY

Vision
A sustainable economic future by unlocking Australia’s hidden mineral wealth.

Goals
Drive ongoing investment in mineral exploration, generate new exploration opportunities, stimulate major new discoveries, and ensure the continuity and longevity of Australia’s mineral resources industry for the benefit of all Australians.

BENEFIT OF MINERALS TO THE NATIONAL ECONOMY

The mineral resources sector plays a vital role in Australia’s ongoing economic prosperity. The sector dominates the nation’s export earnings, provides substantial direct and indirect employment and investment in regional and indigenous communities, supports downstream and service industries, and delivers essential revenue to governments.

In 2015–16, mining directly contributed around 6 per cent of Australia’s GDP, employed more than 228,000 people and generated 50 per cent of the nation’s export earnings.

Estimates produced by Deloitte Access Economics suggest that the gross value added from mining and METS activities was $133.2 billion in 2015–16. Indirect contribution for the same period is estimated to have added $103.6 billion to the economy and over 650,000 jobs.

The combined direct and indirect contribution of minerals in 2015–16 was $235.8 billion, which is 15 per cent of the national economy, and 1.14 million jobs, comprising 10 per cent of full-time employment.

SCOPE OF THE STRATEGY

This National Mineral Exploration Strategy will address the technical risk and the science and technology of mineral discovery required to unlock the potential of under-explored regions of Australia. This Strategy, as endorsed by the COAG Energy Council, will be delivered by the Geoscience Working Group (GWG), which comprises the Commonwealth, state and territory government geological surveys. This Strategy will be delivered in partnership with the resources industry, the research community, and the services sector. This Strategy includes programs to attract increased investment into the Australian exploration sector but does not address the financial or regulatory challenges facing mineral exploration.
COLLABORATION–TURNING $MILLIONS INTO $BILLIONS

NATIONAL MINERAL EXPLORATION STRATEGY

UNLOCKING AUSTRALIA’S HIDDEN MINERAL WEALTH

- PRE-COMPETITIVE GEOSCIENCE
- PROTECTING THE ENVIRONMENT
- HARNESSING CAPABILITY
- SUPPORTING COMMUNITIES

MINERAL INVESTMENT ATTRACTION PLAN

AUSTRALIA MINERALS

INFLUENCE  SUPPORT

INDUSTRY

SUSTAINABLE ECONOMIC FUTURE
THE STRATEGIC CONTEXT FOR THE NATION

STRENGTHS
In terms of mineral endowment, Australia ranks number one globally in gold, nickel, iron ore, lead, zinc and uranium and ranks in the top five for many other important minerals. Australia’s explorers and miners are world-class; they have a history of finding and then converting ore bodies into wealth through their efficient production and supply systems.

Australia’s sovereign risk is considered very low with sound governance and legal frameworks that support business and encourage investment. Australia has well-regarded legislative frameworks around environmental protection, cultural heritage, health and safety, labour rights and land owner rights, all of which are increasingly favoured by issue-sensitive investors and communities.

The Australian geological surveys are world leaders in freely providing pre-competitive geoscientific data and knowledge. Unlike some competitor destinations, the Australian geological surveys work together to advance the national interest in attracting new investment.

Australia’s university and research sector are world leaders in minerals geoscience, which provides not only new knowledge but also contributes to Australia’s highly skilled workforce. The service sector and the nation’s innovative cooperative research centres provide practical solutions for industry.

OPPORTUNITIES
With ongoing industrialisation and population growth expected to continue globally, particularly in Asia and Africa, demand for mineral resources is projected to rise over the coming decade and beyond. Commodity price rises are expected and there will be increasing demand for critical and strategic metals associated with high-tech industries, as well as base and precious metals from low-cost, long-life mines.

Making new mineral discoveries is becoming more difficult and costly as exploration typically extends deeper and increasingly under cover. Tackling exploration under cover is arguably the most significant technical challenge facing mineral explorers globally and particularly in Australia. This cover challenge provides an opportunity for discovery, since most of the long-life profitable mines have been found in the 20 per cent of the Australian continent that has prospective rocks and Tier 1 deposits exposed at, or close to, the surface.

The remaining 80 per cent of the continent represents a largely unexplored or under-explored opportunity with vast flat-lying plains of sands, soils and gravels covering prospective rocks. There is no reason to believe that these covered prospective rocks are any less endowed in minerals than the well-established mining regions. Australia has an exciting opportunity to acquire and deliver new pre-competitive information across these under-explored regions, thereby enhancing exploration effectiveness for the discovery of new Tier 1 deposits.

Australia also has the opportunity to be the global leader and centre of excellence (the ‘Silicon Valley’) for under cover exploration. Our skills and know-how will be in high demand by other nations facing similar challenges, which will create enormous additional opportunities for export earnings and well-paying jobs.

WEAKNESSES
Australia’s current economic prosperity has been built on the back of iconic mines discovered decades ago, many of which are now approaching the end of their economic life (e.g., Mt Isa, Broken Hill, Kalgoorlie). Extensions to existing resources will continue to support production volumes in well-established regions. Over time, however, the overall economics for these regions is bearish. More recently the appetite for mineral exploration investment risk has diminished, which is reflected in the focus on near-mine exploration at the expense of under-explored regions that have greater potential for new discoveries, but also greater risk.

In the early 1990s, Australia dominated mineral exploration expenditure with around 21 per cent of the global share and we reaped the economic rewards 10–15 years later. Due to increasing competition Australia has now slipped to less than 12 per cent of global exploration spend (in 2016).

More importantly, quality Tier 1 discoveries are not being made. For example, in the 2007–16 decade there were 12 Tier-1 discoveries found around the globe; four of these were in Canada and none in Australia. Through this period Australia achieved around 20–25 per cent of the global deposit discoveries (from only 12 per cent of total spend). These new discoveries, however, were mostly small and made by the generally poorly-resourced junior exploration sector in well-established mineral provinces.

THREATS
There are perceptions by some that Australia is a mature exploration destination where the easily won near-surface deposits were largely discovered many decades ago. Australia faces increasing global competition for investment expenditure from every jurisdiction that encourages mineral exploration. These competitor jurisdictions are emulating many of the initiatives that originated in Australia (such as pre-competitive data, collaborative drilling, UNCOVER, investor forums etc).

Explorers are now facing increased scrutiny of their ‘social licence’ from the community and governments. As a result there has been an increase in costs through longer lead times to access land and complying with stricter regulations and increased community expectations. Other costs such as labour make Australia a high-cost destination relative to many other less developed countries.

Many regional communities face the threat of losing their main economic driver as a number of long-term mines are reaching the end of their economic life. The demise of these mines will not only dramatically impact these communities but also government treasuries through a loss of revenue. Community pressure will increase as alternative sources of income and employment are demanded from government.
What lies beneath the flat sand plains that make up much of this photograph? Is there a deposit under there waiting to be discovered? This National Mineral Exploration Strategy will help us answer that question not just here, but across the vast outback plains that comprise around 80 per cent of Australia.

Image: Matthew Campbell (Top Geoshot competition, Geoscience Australia).
URGENCY
Mineral exploration in Australia is conducted by the private sector whose track record of significant discovery over the past decade has not met expectations based on historical performance. The identification of new high-quality deposits is urgently required to ensure that an ongoing pipeline of mineral resource projects is available to meet future economic needs of the nation. Increased and more effective exploration is needed now in order to replace the production from predicted near- and medium-term mine closures. Furthermore, committed action is required because the time taken between a deposit discovery and the mine commencing production is on average 12.7 years¹.

STRATEGIC INITIATIVES
The Geoscience Working Group (GWG) will deliver this Strategy by:

1. **Encouraging investment** through a renewed commitment to the creation and delivery of government-funded pre-competitive geoscience from all jurisdictions, including new techniques, and a refreshed approach to the global promotion of Australia as the lead destination for investment in mineral exploration and mining.

2. **Harnessing our capability** through a cross-institutional research venture focused on delivering the applied geoscience needed for industry to better explore beneath the covered regions of Australia, as well as continued development and promotion of Australia’s world-leading METS sector.

3. **Protecting the environment** through provision of robust baseline pre-competitive geoscience data for evidence-based decision making and reducing the exploration footprint.

4. **Supporting our people and communities** through wider engagement and clear communication of relevant geoscience information, and the economic and social benefits of a vibrant minerals industry to a broad audience.

ENCOURAGING INVESTMENT
This theme has two inter-related elements: 1) pre-competitive geoscience to support decision-making; and, 2) a refreshed Mineral Exploration Investment Attraction Plan.

Pre-competitive geoscience
Several recent government reports⁸ have recognised the immense public-good value of pre-competitive geoscience information to grow prospectivity, reveal new opportunities, reduce exploration risk and drive industry investment.

The Australian geological surveys are world leaders in the acquisition, development, application and delivery of the pre-competitive geoscience information that is needed to unlock Australia’s enormous mineral potential in the vast under-explored regions of the continent. For example in the late 1990s and early 2000s the Geological Survey of Western Australia, in collaboration with Geoscience Australia, acquired pre-competitive data in the desert of Western Australia. The data identified a new prospective corridor that was followed up by exploration in 2012, which led to the discovery of Gruyere, a greater than 6 million ounce gold deposit. This collaborative government survey costing several million dollars helped create more than US$7.5 billion in new wealth.

The pre-competitive geoscience information and digital delivery systems maintained by the surveys have provided this country with a substantial competitive advantage. Competitor destinations are increasingly emulating past Australian efforts and are catching up, which is jeopardising our international leader status.

National and international competitive advantage will be best achieved by renewed investment in pre-competitive data as well as creating new and innovative tools and decision-support systems that will maximise the full value of government investment.
Enhancing our use of high-performance computing, ‘big data’, the ‘cloud’ and the creation of new virtual research and exploration laboratories, will also be essential. This system will be a point-of-difference to help convert Australia’s favourable international benchmark into enhanced investment, more effective exploration and subsequent discovery and new wealth creation.

Actions

- Direct new pre-competitive programmes at a quantum dependent upon available Australian, state and territory government funding, with planned acquisition programmes for 2017–22 to include large regional seismic, magnetotelluric and airborne geophysical surveys, stratigraphic drilling, geological, geochemical and isotopic mapping and sampling, reports on the potential for a range of commodities and mineral systems and the compilation, synthesis and delivery of company geoscience and exploration (and environmental) data.
- Pursue digital collaboration to maximise Australia’s advantages of vast online data holdings, through AuScope’s infrastructure, advanced computer codes, supercomputing facilities and advanced technologies.
- Create a new digital undercover exploration decision-support system that maximises the useability of the pre-competitive data and tools. The system will be an open-source digital platform for decision making by government, industry, and researchers and will be an environment within which the METS sector can create new applications and value.

Mineral exploration investment attraction plan

Australia Minerals is led by the GWG with the aim of coordinating the Australian, state and Northern Territory governments’ efforts to attract investment in mineral exploration and development in Australia. Australia Minerals delivers a collaborative and cost-effective vehicle at key events internationally and domestically and has carriage of shaping the Mineral Exploration Investment Attraction Plan.

The objectives of the Plan are to:

- promote Australia as the preferred destination for investment in mineral exploration
- advocate opportunities in under-explored regions, new mineral system concepts, new mineral provinces and new commodities
- target all market segments responsible for guiding investment decisions in mineral exploration.

The Plan identifies key investor segments (major mining companies, financiers and junior mineral exploration companies) and the locations of target markets. It articulates the wide range of geological and policy factors that make Australia an attractive exploration investment destination and seeks to use the combined strength of the Australian governments (including Austrade and state and territory trade missions) to promote investment in the Australian mineral exploration sector.

Actions

- Refresh the Plan in 2018 to account for changing marketing channels (including social media) and develop a fresh mix of appropriate products and delivery channels for each investor segment and region.
- Coordinate a ‘register of issues’ that will ensure currency and alignment of the Australia Minerals offer and messaging.
- The Plan will be a ‘live document’ allowing changes in market sentiment, commodity interest, technological and political changes to be met so that Australia remains competitive in retaining current, and in attracting new, investment.

HARNESSING OUR CAPABILITY

Successful delivery of this Strategy will require high-level collaboration amongst all stakeholders, as well as effective and targeted communication of the science and its impact.

Australia has made excellent progress in harnessing the national mineral exploration capability through the UNCOVER initiative. The UNCOVER capability comprises experts from the minerals industry and its advocate groups, the geological surveys, the research community including Universities and CSIRO, the METS sector and the relevant CRCs. UNCOVER has galvanised the community to create a shared vision of the strategic priority needs of industry and has mapped the necessary activities, their sequencing and their costs. The activities include new geoscience data acquisition, compilation and delivery, new research, and new technology development. These activities are required to make the necessary step change in mineral exploration effectiveness in Australia.

Australia’s geoscience research community has the capacity for the necessary innovation to address the difficult challenge of mineral exploration under cover. The geoscience research community consistently ranks as the nation’s highest impact discipline and this excellence extends to industry and government researchers. Harnessing our capability by building even stronger partnerships with universities, AuScope infrastructure, CSIRO and the CRCs will be integral to the success of this Strategy.

Actions

- Align government pre-competitive initiatives with the UNCOVER Roadmap priorities.
- Build stronger collaborative and strategic links around the UNCOVER research activities with universities, industry, other government departments, CSIRO and CRCs.
- Partner with the METS sector to promote and develop Australia’s world-leading capability.
- The Government Geoscience Information Committee will advise the GWG on new information technologies, data standards and platforms for data integration, visualisation and delivery.
- Support and encourage training and development through participation in projects with universities, current and future CRCs and in education and training ventures such as the Minerals Council of Australia’s NExUS undercover school.
Pre-competitive data informs on the geology of our planet. A number of these datasets have direct bearing on understanding and managing the environment. Image: Digital Earth Australia’s water observations from space of the Darling River and Menindee Lakes, Western NSW.

PROTECTING THE ENVIRONMENT

The pre-competitive data acquisition component of this Strategy requires numerous field activities that will be conducted safely and in ways that minimise impact on the environment.

A number of pre-competitive datasets designed for use in mineral exploration can also be used to monitor the environment and to establish baseline information. Such information includes time-series satellite images, digital elevation models, geophysical datasets, hydrological models, geochemical databases and models of soils and groundwater.

Actions

► Ensure all field activities comply with relevant legislation.
► Integrate geoscience with environmental science elements into the pre-competitive work.
► Ensure effective availability and delivery of data relevant to environmental and other land use stakeholders.
► Support the Resources Data Initiative (RDI) and the Foundation Spatial Data Framework\(^{13}\) where environmental data are delivered in a way that connects to the GWG’s geoscience information portal (AusGIN).

SUPPORTING OUR PEOPLE AND COMMUNITIES

This Strategy sets a long-term approach to supporting people and communities by promoting the economic benefit derived from the resource sector. The Strategy also aims to increase community awareness and understanding of the other benefits of the national resource sector, by outlining the value-multiplier effect of industry attracted to Australia as well as the positive social and economic dividend derived from strategic long-term resource sector planning.

Actions

► Deliver new maps and understanding that delineate the primary prospectivity of Australia.
► Measure the impact of this Strategy in terms of jobs and the leverage value created.
► Communicate the value of geoscience through education of the public on contentious issues as well as the benefits of resources to our everyday lives.
Minerals permit modern life. Renewable energy generation relies not only on specialist metals such as neodymium, but also copper. Four times more copper is needed to generate a unit of electricity from renewable compared to conventional generation. Image: Ian Sutton, Wikimedia Commons.

**SUPPORTING ACTIVITIES:**
**CROSS-JURISDICTIONAL COLLABORATION FOR REGULATORY REFORM**

The ongoing strength of the minerals sector and its capacity to support the Australian economy into the future is dependent on a sustainable development regime and efficient and effective legislative frameworks.

The Australian Government is working in collaboration with state and territory governments through the COAG Energy Council to improve environmental approval processes and reduce the regulatory burden on new developments. In addition, there are initiatives being undertaken by the Senior Committee of Officials (SCO) to address issues such as legislative barriers, land access for resources, and mineral resource and production reporting.

The GWG will also continue to work through the Government Geoscience Information Committee to develop nationally consistent standards for industry reporting of geoscience and exploration data, and ensure that these standards keep pace with emerging techniques and technologies.

**STRATEGY PERFORMANCE REVIEW**

An annual report reviewing the progress and impacts of this Strategy against the four strategic themes will be provided through the Resources Advisory Panel of SCO.

**FUTURE STATE**

The desired outcome of this Strategy is a prosperous Australia that leads the world in the identification and development of new economically-significant mineral deposits in technically challenging under-cover conditions in a safe and sustainable way.

The outcome will be achieved through the collective efforts of the geological surveys working in partnership with industry, METS sector, the research community and by wider public engagement.

Success will be measured by Australia remaining a desirable investment destination and one where this appeal is matched by an increase in the global share of mineral exploration expenditure.

1. Deloitte Access Economics 2017 (Mining and METS: engines of economic growth and prosperity for Australians)
2. Minerals Council of Australia 2015 (The Whole Story: Mining’s contribution to the Australian community)
4. Tier-1 deposits are large, long-life and low-cost mines (>20 years, >200 ktpa Cu or >250 koz pa Au and an NPV >1 billion)
7. Richard Schodde 2016 (IMARC presentation “The strategic benefits to Governments in supporting exploration”)
11. UNCOVER operates under the aegis of the Australian Academy of Science as a collaborative forum that includes industry, universities and government—http://www.uncoverminerals.org.au/