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Mr Ian Blayney MLA
Chairman
Economics and Industry Standing Committee
Parliament House
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Dear Mr Blayney

Rio Tinto Submission – Inquiry into Technological and Service Innovation in Western Australia

Thank you for inviting Rio Tinto to make a submission to the Economics and Industry Standing Committee (**Committee**) regarding the recently announced Inquiry into Technological and Service Innovation in Western Australia (**Inquiry**).

This submission sets out Rio Tinto's views on the critical role of innovation and technology in driving better outcomes for safety, productivity, skills development and environmental management in the resources sector, which also has application to the broader economy. The submission also provides details in relation to:

- The specific terms of reference of the Committee's Inquiry listed in your letter; and
- Provides some key examples of the recent innovation and productivity improvement initiatives undertaken by Rio Tinto at its Western Australian operations.

As a general observation, we welcome and support the conduct of this Inquiry.

We are confident that the Committee's deliberations will make a valuable contribution in focussing greater attention on the critical role that technological and service innovation is likely to play in the future growth and diversification of the Western Australian economy.

Over our history, Western Australia has derived enormous value from the natural competitive advantage of its resource endowment in terms of minerals, oil & gas, agriculture and aquaculture. In particular, the last ten years has seen a sustained expansion in the mining and gas resources sector that has driven economic growth, extraordinary levels of investment, high employment and significant revenue in the form of royalties and taxes.

While Western Australia still has mineral and gas reserves that will last for decades to come, we are increasingly facing challenges to our global competitiveness in terms of:

- Alternative global supply from traditional and non-traditional source countries coming into the global market place;
- High costs of doing business in Western Australia relative to our major international competitors in South America, India, China and Africa; and
- Need to ensure that Western Australia remains an attractive destination for investment capital.

At the same time, there are clear and increasing expectations from both regulators and the community that all industrial activity in Western Australia should be conducted in a

manner that ensures the safety of employees, enhances productivity and promotes effective and sustainable environmental management.

In order to achieve these outcomes, Western Australia must build on its natural endowments and adopt a clear strategy to foster an innovative, collaborative and scientifically-literate culture that can create new competitive strengths in innovation and technology across the entire Western Australian economy, not just the resources sector.

We look forward to the Inquiry's contribution to the public dialogue regarding these issues, especially in terms of encouraging industry, Government policy makers and the broader community to embrace this opportunity to increase the State's business productivity, competitiveness and prosperity.

About Rio Tinto

Rio Tinto's major products are aluminium, copper, diamonds, gold, industrial minerals (borates, titanium dioxide and salt), iron ore, thermal and metallurgical coal and uranium. We have over 60,000 employees working in more than 40 countries across six continents. We are strongly represented in Australia and North America, and also have significant businesses in Asia, Europe, Africa and South America.

In Western Australia we produce iron ore, salt and diamonds.

Under our Group-wide organisational structure, our four product groups – Aluminium, Copper & Coal, Diamonds & Minerals and Iron Ore – are supported by our Exploration and Technology & Innovation groups.

Rio Tinto Iron Ore (**RTIO**) is the world's second largest producer of iron ore. We carry out extensive mining operations in the Pilbara region of Western Australia. Our operations are made up of a network of 15 mines, four independent shipping terminals, and the largest privately owned heavy freight railway in Australia. In Western Australia we employ more than 12,800 people, the majority of whom work in the Pilbara region.

Rio Tinto's Technology & Innovation (**T&I**) group focuses on creating sustainable value and competitive advantage by making improvements to the way we operate. T&I partners with Rio Tinto product groups (including RTIO) and external partners to provide technical insights and embed an innovation culture into how we run our operations and deliver our projects. T&I employ approximately 600 people around the world.

Rio Tinto's approach to innovation

Innovation, productivity and partnerships have been fundamental to Rio Tinto's operating model for decades. We have established a leading position in the development and application of technology and innovation (particularly automation) in the resources sector, which has helped us to prosper throughout the movements of the resources cycle and, in so doing, drive value and opportunity over the long term for our shareholders and the Western Australian community.

Rio Tinto has a clear innovation strategy, driven by a resolute focus on improved safety and productivity. At the heart of this strategy is our Mine of the Future™ programme, a suite of initiatives that represent one of our most significant competitive advantages and adds value to our business by bringing a sustained focal point to our innovation efforts and operational activities.

Our Mine of the Future™ programme delivers next-generation systems and technologies that equip us to conduct smarter mining, with greater efficiency and lower production costs as well as improved health, safety and environmental performance. It combines many aspects of innovation excellence to deliver fully integrated operational processes that are coordinated from a central location, enabling a holistic view of all operations from mine to port. This programme has been the result of many years of investment, research and planning, as well as long-term committed collaboration between Rio Tinto, research centres and key business partners, with specific initiatives often originating in academia but through these collaborations, resulting in a commercial outcome.

With this programme, we are demonstrating how both “step changes” (where appropriate) and incremental improvements can be made to mining processes, including developments in haulage and drilling automation and remote operations, that is revolutionising the way mining has been conducted for more than 100 years.

As an illustration of this point, it is well known that safety is fundamental to everything we do at Rio Tinto. In adopting any new technology or innovation, the safety and wellbeing of our people is our most important guiding value. In this context, autonomous technology is an example of where technology is helping to make our operations safer by reducing employee exposure to hazards and risks associated with operating heavy equipment, such as fatigue related incidents (and particularly those that occur on night shift) and also sprains, strains and other soft tissue injuries. For example, automated trucks and drills are able to operate for longer periods within each shift resulting in a higher effective utilisation. The major drivers include elimination of crib, breaks, absenteeism and shift change. This more than offsets the inherent requirements of automation, such as, longer daily inspections on technology hardware.

Some other key examples of productivity improvements undertaken by Rio Tinto in Western Australia include:

- Our Operations Centre in Perth remotely manages our entire Pilbara iron ore network in Western Australia which consists of 15 mines, 31 pits, 1,700 kilometres of rail, four port terminals, as well as power and other infrastructure. The Operations Centre has been a fundamental element in the expansion of our Pilbara operations. It has enabled the effective coordination between our expansion and operations teams enabling a transition to the increased nameplate capacity, ensuring optimal supply chain performance.
- We are the largest owner and operator of autonomous trucks in the world with 66 trucks operating across three sites in the Pilbara. The usage of autonomous truck technology is focused on improving productivity, and environmental performance. At our Hope Downs 4 operation our automated trucks have load utilisation rates 14 per cent higher than manned trucks and their operating costs are 13 per cent better. These trucks (as well as all other vehicles at the site) have on-board computers that inform them of the position of other vehicles and communicate with the computer systems at the Operation Center. Trucks are fitted with radars, lasers, communication antennas and high precision GPS to operate communications, guidance and avoidance systems. These systems enable trucks to use pre-defined GPS courses to automatically navigate haul roads and intersections; move within the loading and dumping areas; enter the tie-down area for refueling; and interact with manned equipment such as excavators, graders, bulldozers and light vehicles.
- Our West Angelas mine is the world’s first full-time autonomous drill mine, with seven drill rigs in operation having drilled over two million metres. As a result of this technology we have seen a 15 per cent increase in use of availability and significant improvement in labour productivity at West Angelas.
- Our Remote Draft Survey (**RDS**) technology at our Parker Point port operation in Dampier provides real time measurement of the vessel position, assisting the ship-loader operator to avoid collision with the vessel and maintain the vessel upright within safety limits whilst loading.
- Rio Tinto is set to deliver the world’s first fully-autonomous heavy haul, long distance railway system, enabling us to more safely and efficiently deliver extra tonnes at a lower cost. This programme of works is known as AutoHaul™. It will eliminate the need for around 70,000 kilometres of remote area driving each week to get train drivers in place to start or finish their shift, as well as provide flexibility in scheduling and eliminate driver changeovers. Steady progress is being made in the testing and verification of AutoHaul™, with over 170 journeys covering 25,000 kilometres completed by the end of June 2015.

COMMITTEE TERMS OF REFERENCE

What drives innovation

In the resources sector, the drivers of innovation can be best understood in the context of a series of challenges that are relatively consistent across most resource projects in Western Australia. These are:

- Health, safety and wellbeing of employees and contractors must be our highest value and priority;
- Intensity of competition in global commodities markets means that we must produce at the lowest possible cost;
- In many established resource regions, recoverable deposits are becoming harder to access and many are declining in quality; and
- The standards by which we manage our impact on the environment are increasingly becoming a major differentiator between resource companies and industry sectors.

Based on Rio Tinto's experience, there are six key drivers for innovation which have underpinned our approach to innovation.

1. Leadership and strategy

Innovation success starts with leadership and strategy in which innovation is prioritised as an important component of the business strategy. This requires strong and progressive senior executive leadership to maintain focus on innovation over time, as well as a corporate appetite for change and a tolerance for experimentation and some risk.

It is the view of Rio Tinto that for innovation to be undertaken successfully there must be a clear focus. For Rio Tinto, this focus is directed to safety and productivity, which has delivered positive outcomes for our people, competitiveness, operations and environmental impact.

Without strong management - and the talented and skilled workers to implement it correctly – attempts at innovation will not add the additional value necessary to justify the investment in research, testing and application of new technologies and innovations.

2. Culture of collaboration and creativity

The drivers of innovation can rarely be achieved in isolation. In order to realise our vision for innovation, Rio Tinto often harnesses the power of collaboration, with our private sector partners, suppliers, the university sector and State and Federal governments.

The goal must be to develop an open, collaborative, and supportive culture that promotes creativity, dialogue, learning and research to create a business that looks for answers within and without, that listens to its customers, its partners, market analysts, and works with them to define tomorrow's product needs and market.

A focus on innovation also has the effect of encouraging the creativity of individuals and contributes to behaviours and culture that lead to better outcomes in terms of efficiency and competitive advantage. It also helps attract and retain the very best employees.

We only invest in technology and innovation if it results in improving business safety, reliability and efficiency and this is dependent on the input, commitment and interaction with our employees – our people are part of every step of this journey.

3. Data-driven innovation

As a leader in this field, Rio Tinto takes the same approach to introducing new technology as it does with any development or investment - we use data to inform our decision making to make sure we are focussing our innovative efforts on the highest value areas of our business.

We also have a common system through which our technologies communicate and we bring our people on the journey through participation and their contribution as individuals and in teams.

4. Opportunities provided by technology

Technology itself is also a major driver of innovation.

For many years, technology in the resources sector provided gradual improvements. However, in recent years, this has accelerated as the result of the emergence of powerful new technologies.

Some of this recently developed technology represents a profound change in how mining will operate into the twenty first century. New technologies have delivered a broad range of benefits including:

- Enhanced employee health and safety outcomes;
- Technical efficiencies that make better use of equipment and cut down on materials and energy usage; and
- Improved environmental outcomes, such as through the use of autonomous equipment which generally operates in a more precise and efficient manner, resulting in fewer consumables and less energy are used in their operation.

5. Importance of People

While there is no doubt that the some of the technology available today is remarkable and offers significant safety, productivity and cost savings, investing in our people is an equally important component of our approach to drive and enable innovation. In this sense, while technology is necessarily critical to the success of our business, but it is nothing without our people who are developing, testing and operating this technology.

We are also re-positioning our business as a collaborative network of what we call “high performance teams” to drive our overall leadership position. This approach recognises that it is our people and our culture that are fundamental to achieving a united focus, creative solutions and excellent performance, based on good communication, diversity of thought and a culture of collaboration.

As technology and innovation has always done, it is evolving the nature of work and our workplace while creating new opportunities for skills development, extending the experience of employees and broadening our skills mix.

As a result, we will to continue to invest in the skills of our people to meet the requirements of the future of our industry.

6. Promotion of STEM education

We are very fortunate that Western Australia has world-class schools and universities delivering a large pool of highly educated and skilled people.

However, one the key challenges we face is a decline in young people studying science, technology, engineering and mathematics. To be competitive Australia needs to be at the forefront of technology and innovation. If we do not encourage more young people to study science, technology, engineering and mathematics, then innovation will occur elsewhere and Western Australia will be less competitive.

Rio Tinto partners in a number of programmes aimed at increasing the number of Australian students studying and being interested in science and mathematics including:

- Australian Academy of Technological Sciences and Engineering (**ATSE**);
- University of Western Australia (**UWA**) ‘Girls in Engineering’ a programme; and
- Rio Tinto Innovation Central exhibition developed in partnership with Scitech in Perth which is inspiring and developing tomorrow’s creative thinkers.

Collaboration between government, universities, and business

As noted above, Rio Tinto seeks to actively engage with governments, universities and our business partners to realise our innovation agenda. We collaborate across these sectors because cooperation is an avenue to bring together multidisciplinary excellence and varied experience.

It is our view that a commitment to collaboration is fundamental in driving the complex technology and innovation initiatives that are essential to moving the resources industry forward.

A collaborative partnership model promotes the clear identification of project scope, expectations and deliverables and this approach has assisted Rio Tinto in achieving both 'step change' and incremental improvements in our operations and providing complex solutions in order to overcome significant technical challenges. It is our experience that collaboration often promotes the kind of innovation culture in which significant departure from "business-as-usual" processes can be realised.

We work closely with many of large and small suppliers to develop systems and technologies that significantly improve productivity are better for the environment and safer for our people. This includes companies like Komatsu, Hitachi, Ansaldo and General Electric. We also have partnerships with a range of tertiary education and research institutions, including UWA, Massachusetts Institute of Technology, University of Sydney and Duke University, as well as the US defence, aerospace and space sectors.

Our experience of these productive relationships suggests that this type of collaboration works best when partners seek to:

- Select a small number of priority areas that can bring the most value – for Rio Tinto, that was automation – and then look across the globe for partners who can add the most value;
- Clearly understand that all partnerships need to be mutually beneficial; and
- Base their collaboration on a strong business case that takes a long-term view and is outcomes-focussed.

In addition to these requirements, successful collaboration can only be realised when it is based on solid foundations - very often provided by investment in research, where there are few shortcuts available and time, perseverance and courage are all required. One opportunity to further improve collaboration would be to promote an increase in the number of people moving between industry, government and universities to promote better understanding and a cross-fertilisation of expertise.

Currently, there are a number of examples of where this partnership approach is delivering value to Rio Tinto, particularly in driving innovation in safety and productivity improvements. These include:

- With UWA, Rio Tinto is pooling our knowledge of orebody geology and advanced physics, in the development of an Airborne Gravity Gradiometer (**Gradiometer**). The Gradiometer is an advanced piece of exploration technology designed to detect otherwise invisible, buried ore bodies. Operating from an aeroplane, it is the next-generation in airborne survey systems. The technology measures subtle changes in the earth's gravity field, from which it produces a density map that identifies the presence of ore bodies. It is the view of Rio Tinto that as ore bodies become harder to find, pioneering new technologies like the gradiometer will become essential in discovering the next generation of mineral resources.
- Rio Tinto has recently announced a partnership with international policy think tank the Perth USAsia Centre (**Centre**), which is also situated at UWA. Our \$1 million commitment over four years will support the Centre's core policy development, research, education and network-building programmes. The partnership will foster the already strong connections and future opportunities for our business in the regions of North America, Australia and Asia, including academic and policy programmes to increase industry participation, technology development and strategic community and stakeholder engagement.

- In March 2014, we opened the Rio Tinto Excellence Centre in Brisbane, bringing together subject matter experts from across the resources sector. These teams work in conjunction with our process engineers, analytics teams and external partners to improve the operating productivity at our copper and coal sites around the world using real-time data analysed by subject matter experts. The Excellence Centre team is supported by an in-house analytics centre in Pune, India, where we have partnered with the US based global business group IGATE, providing us with analytical capabilities to identify opportunities for enhancing efficiency and productivity across those managed operations.
- Rio Tinto has partnered with the University of Sydney to work on mine automation, resulting in the world's biggest commercial privately funded external robotics initiative. This collaboration was also the basis for our new autonomous drill technology which we have implemented in our Western Australian iron ore operations.
- Rio Tinto's industrial partnerships extend to some of the world's most significant companies, in and outside the resources industry. For example, we have developed AutoHaul™ in conjunction with Komatsu in Japan. More recently we've started working with Hitachi, a company that invests over \$5 billion into R&D each year. Rio Tinto is working with Hitachi on opportunities to improve our overall energy productivity performance.
- As always safety is our number one priority. Rio Tinto continues to work closely with the Department of Mines and Petroleum (DMP) to ensure the safe operation of autonomous equipment. We have played a significant role, along with the DMP in the development of the guidance materials for the Safe Mobile Autonomous Mining in Western Australia Guidelines, which are due for publication this year.

In addition to these project partnerships, we also see a critically important role for government and industry to collaborate in the promotion and fostering of STEM education (science, technology, engineering and mathematics). It is our view that STEM education, particularly in universities, needs to be geared towards the requirements of industry and that partnership between industry and universities are an important enabler in these efforts. In this regard, our partnership with Scitech to promote STEM subjects in primary and secondary schools is a prime example of how industry and Government can work together to showcase the excitement and relevance of STEM through interactive and engaging hands-on learning and to support teachers to bring science to their students.

How research can lead to the development of new products, services and jobs

Quality research is imperative to the development and successful deployment of new technologies. However, in order to be successful, research must also have a clear strategy and focus. For Rio Tinto, this is the Mine of the Future™ programme, with its end goal of improving safety and productivity.

The opportunity cost of not investing in research should also be considered when looking at the development of new products, jobs and services. There would be significant implications for the Western Australian economy if investment in innovation is constrained, particularly investment in research related to the resources sector. The flow-on effects would harm productivity and the sector would gradually decline in competitiveness relative to the rest of the world. This would be a major threat to the sector and the many thousands of jobs it sustains.

Rio Tinto's above mentioned partnership with the University of Sydney is an example of how applied research has resulted in productivity benefits. We committed \$21m over an initial five year period to the development and implementation of our vision of a fully autonomous remotely operated mine with the Australian Centre for Field Robotics (ACFR). Since its launch, a research and technical team of more than 20 engineers have joined the Centre. This work has resulted in a number of major research advancements, in both fundamental and applied areas. The team has also been working closely with Rio Tinto to transition this new technology into mine operations. The Centre's work so far has resulted in a number of major research advancements targeted at improving the safety and productivity of autonomously operated mine sites, many of which are now running successfully in our operations.

The ultimate research goal in automation innovation is robotics, a target that will create many new jobs in research and ultimately jobs in the resources and potentially other sectors. Automating mining processes remains a formidable task, while robots used in other industrial processes generally remain stationary and performs tasks on products or components conveyed to them, mining robots must move around, often in complex underground or surface environments.

Automated technologies are therefore only made possible by increased computing power, new algorithms for signal processing, perception and control and new sensing technology for monitoring mine geometry (including GPS, radar and laser systems). The requirements to develop and operate these technologies are complex and rely on high-level interdisciplinary skills. The skills learned in research and development will necessarily become highly valuable in the commercial implementation setting.

The creation of new technology not only provides opportunity for our mining equipment technology services, it also leads to new jobs. For example while productivity improvements increase our capability to deliver better margins for each tonne we produce, these enhancements will also help grow and expand our operations creating additional job opportunities.

Technology can also create jobs that do not exist in the industry by allowing us to better utilise and free up human capital for work tasks that are more complex, and require a high level of problem solving skills that automation cannot replicate. This creates new opportunities (including for retraining and re-skilling existing employees) across a range of disciplines, such as specialist communications, systems, electronics, software and niche technical fields.

New jobs are also created in the facilities at the heart of our innovation approach, such as our Operations Centre and the Excellence Centre. These roles offer a path into the resources sector beyond what is often seen as a typical role of a 'miner'. They also offer other advantages, such as reduced commute requirements, more varied career choices and a chance to attract an increased range of people and skills into Rio Tinto.

One key consequence of Australia's position at the forefront of mining innovation is the emergence of an Australian mining technology services and equipment (**MTSE**) sector. As technologies have progressed, the range of technological applications has also widened and a number of MTSE companies now supply industries beyond mining. This industry is set to become a major export earner as a spin-off from the mining industry, which in turn creates new jobs, services and products.

This sector mainly consists of small to medium-sized businesses employing 50 or fewer people and specialising in:

- technology applications for exploration, mine development, mining, minerals processing, minerals handling and transport, and mining maintenance technologies; they include remote sensing, airborne and ground exploration technologies, exploration and mine planning software, remote control systems, protection systems and communications systems ;
- equipment and machinery manufacture and supply, including of scientific and electronic equipment, but also heavy plant, machinery and equipment;
- consulting services, such as surveying, geological, mining, geotechnical engineering, scientific research, laboratory and testing, environmental management, training and other services; and
- contract services, including specialist on- and off-site service contractors

Investing in innovation research also requires patience and a relentless focus on the desired outcomes guided by a clear strategy.

The challenges associated with financing and commercialising new technologies, products and services

Obviously, the cost of developing and installing new technologies is substantial. Creating 'step change' innovation is a long, complex, and costly process that stretches from research and development undertaken in research centres to multiple intermediate stages until the full-scale roll-out and commercial use of technologies.

Financing and commercialising new technologies is a difficult challenge in the mining sector.

In periods of low prices, it can be difficult to find the capital required, and in periods of high or stable prices, it can be hard to justify any change to existing operations. The core of this challenge lies in the need to acceptably de-risk technologies before they are deployed on a mine site, which typically requires a great deal of time, investment and a willingness to accept risk and interruptions. However, in addition to this significant risk profile, there also remains the constant challenge inherent in any attempt to commercialise new technology or innovations that the expected "pay-off" for this investment must be significant enough to incentivize the investment, or companies will simply wait for others to innovate and then copy those innovations.

The other major difficulty in the deployment of new technologies is the need to work within the existing operating processes. While there may be a technological vision that promises a dramatic new improvement, unless a profitable path from the current technologies to the new technologies can be found then the development will not occur.

An example of the challenges of commercialising new technologies can be seen in the move to automation. While the direct benefits of automated mining operations in terms of improved safety, efficiency and environmental outcomes are self-evident, these systems also come at a significant cost. Automated mining relies on an array of new technologies in the fields of computing, signalling and sensing technologies, as well as sophisticated communications systems.

Developing these technologies for a particular mining environment is very complex and requires collaboration between experts from different scientific fields, as well as between the mining company and its equipment suppliers. The roll-out and commercial use of new technologies can only occur after extensive research and development and multiple testing stages.

Overall, and while the costs and associated challenges involved in mine automation are substantial, they are potentially far outweighed by the benefits they can deliver. At Rio Tinto, we seek to address these issues by having a strategy setting out our future direction, allowing us to determine which components of the vision will add the greatest business value.

Models of development by which technological and service innovation could be encouraged in Western Australia

It is vital that the mining industry collaborates closely with academic partners to deliver mining education as well as high quality research capabilities. We need to identify, harness, develop and retain core skills required to run productive and safe mining operations. In spite of the challenges detailed above, Western Australia is a leader in research into mining related activities and it is imperative that the State remains a hub for this activity.

Research Institutions that are funded partly by government and partly by business have developed a number of mining and associated processing innovations, including in the field of mine automation.

Below are examples of models of development used by Rio Tinto to encourage innovation in Western Australia:

- The model provided by the Western Australian government funded Minerals Research Institute of WA (**MRIWA**) is a good example of funding support by Government to enable technological and service innovation in Western Australia. MRIWA provides research funding and scholarships to support a focused range of minerals research activities. This has been shown to be an effective means of

bringing together industry, government and researchers in order to reach outcomes that would not otherwise have been achieved. Rio Tinto supports MRIWA by providing a board member, Dr Andrew Shook, the General Manager of Innovation Technology Platforms in T&I.

- Recently, Rio Tinto sponsored a Resources Innovation through Information Technology (**RIIT**) Hackathon which concentrated on a specific mining problem – detecting oversized boulders in hard-rock mining operations. The winner of this contest, Newton Labs, created an innovative prototype to aid in their detection and is in the process of developing a prototype that Rio Tinto, alongside others, is examining for potential use in mines. This is an example of the type of innovative thinking and 'out of the box' crowdsourcing¹ that can be very beneficial for certain classes of technology problems.
- One of the major challenges with developing new mining technologies is the large cost and risk associated with the necessary testing of technologies at scale. The Federal Government Cooperative Research Centre funded 'CRC Ore' provides a model of an institution that works to bridge the gap between cost, risk and development. A Western Australian centre of this type could be given consideration.
- An example of a current industry initiative driving innovation is the Internet of Everything (**IoE**) Innovation Centre at Curtin University. The Innovation Centre, as part of a global initiative, is aimed at catalysing and showcasing IoE innovation and development, bringing together customers, industry partners, start-ups, application developers, accelerators, government organisations and universities.

Conclusion

Rio Tinto has a clear innovation strategy that targets and has demonstrated safety and productivity improvement. This strategy is fundamental to Rio Tinto's global operations. Striving for excellence in innovation will never reach an end point; at Rio Tinto we are strongly committed to continue on the journey to the Mine of the Future™.

The key recommendations made in this submission are:

- Western Australia must embrace the challenge of innovation and productivity in order to gain and maintain a competitive advantage in the global marketplace.
- In the resources sector, safety and productivity are two critically important focus areas of innovation.
- Collaboration is fundamental in driving the innovation initiatives that are essential to moving the resources industry forward.

Rio Tinto would welcome any further engagement with the Committee and we are pleased to invite the Committee visit our Operations Centre located near the Perth domestic airport at any time as part of their deliberations, if desired.

If you have any questions regarding our submission, or wish to arrange a tour of the Operations Centre, please do not hesitate to contact me

Yours sincerely



Chris Richards
General manager, Communications & External Relations

¹ Crowdsourcing is the process of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, and especially from an online community, rather than from traditional employees or suppliers