

# Discovering Western Australia

New discoveries create opportunities for resources sector

PER  
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## Transforming Western Australia

Western Australia is entering a period of change that will see major transformation across the state.

Western Australian exports exceeded a record-breaking A\$100billion in December last year, with WA accounting for almost half of the nation's total exports (at 44.2 per cent).

There is currently A\$170billion worth of projects either underway or in the pipeline for the state over the next five years.

The list of existing and potential resource projects that will contribute to the state's economic growth is extensive and the state's resources sector continues to generate significant investment activity.

Our mining and petroleum resources and exports make Australia internationally significant.

In October this year, Western Australia will host the Commonwealth Heads of Government Meeting (CHOGM) – the largest gathering of global leaders in Australia's history.

CHOGM will launch Western Australia onto the world stage, raising our profile and creating further opportunities for the state.

With big projects and a bright future, Western Australia is entering a new era of growth.

**Colin Barnett**  
PREMIER OF WESTERN AUSTRALIA & MINISTER FOR STATE DEVELOPMENT

**Norman Moore**  
MINISTER FOR MINES AND PETROLEUM

### Prospect

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Cover photo: Airborne magnetic and radiometric survey image of the Eucla Basin up to the South Australia border – story page 11.

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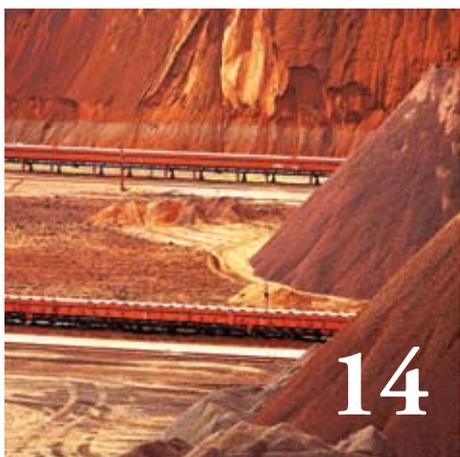
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# WA EXPORTS

## TOP \$100 BILLION

Western Australia's resources industries dominated Australia's merchandise export earnings in 2010, with the state's exports passing A\$100 billion for the first time.

According to Australian Bureau of Statistics figures, the state's A\$102 billion earnings accounted for 44.2 per cent of national merchandise export income.

This was almost equal to the combined earnings of the next three strongest performers - Queensland (A\$49.9b), New South Wales (A\$33.8b) and Victoria (A\$19.1b).

Iron Ore exports worth A\$48.1 billion, a 64 per cent increase on 2009, accounted for almost half of total Western Australian earnings.

Petroleum exports including oil, condensate, liquefied natural gas (LNG) and liquefied petroleum gas (LPG) were worth more than A\$18.5 billion, a 40 per cent increase on 2009 and 18.4 per cent of Western Australia's exports.

Gold exports were worth A\$14.3 billion and a range of metals exports including alumina, nickel and copper together earned more than A\$10 billion.

Of the top eleven export categories, worth a combined A\$94.4 billion, the only non-mineral or energy export was wheat worth A\$1.7 billion.

Reflecting massive iron ore export increases, China remains the state's biggest customer taking almost A\$41 billion worth of exports, a 52 per cent increase from 2009.

Japan stayed second biggest, with exports increasing by 44 per cent to A\$18 billion and Korea's A\$9.1 billion purchases escalated it from fifth to third with a 52 per cent growth rate matching China's.

Other important destinations included India (A\$7b) and the United Kingdom (A\$5.5b), with key South East Asian markets Thailand, Singapore Indonesia and Malaysia, the destination for exports, worth a combined A\$8 billion, a 20 per cent increase on the previous year. ■

### WA Exports by commodity: 2010

	Value (FOB) (A\$ billion)	Share of total exports (%)	Change from 2009 (%)
1 Iron ore	48.1	47.2	64.6
2 Gold	14.3	14.0	-4.8
3 Crude oil	10.4	10.2	47.9
4 Confidential items (mainly alumina)	8.0	7.8	12.3
5 LNG	7.3	7.2	30.5
6 Wheat	1.7	1.7	-24.3
7 Copper ore	1.6	1.6	29.1
8 Precious metal ore	0.8	0.8	377.4
9 Base metal ore	0.8	0.8	41.3
10 LPG	0.8	0.8	18.8
11 Nickel ore	0.7	0.7	9.7
	94.4		
<b>Total exports</b>	<b>102.0</b>		<b>32.6</b>

Ranking for 2010	Ranking for 2009	Country	Exports for 2010	Exports for 2009
1	1	China	40,980,440,641	26,881,135,366
2	2	Japan	18,085,446,367	12,476,230,141
3	5	Korea, Republic of	9,181,779,085	6,009,349,333
4	3	India	7,175,145,609	7,615,714,467
5	4	United Kingdom	5,485,455,997	6,050,100,192
6	7	Thailand	3,591,777,331	2,033,469,371
7	6	Singapore	2,636,391,409	3,003,688,053
8	8	Taiwan	2,247,520,446	1,318,621,344
9	9	United States of America	1,477,966,402	1,151,297,187
10	11	United Arab Emirates	1,070,722,685	820,841,815
11	10	Indonesia	1,064,607,015	1,116,986,694
12	13	Malaysia	839,144,994	600,085,437
13	18	Hong Kong (Sar Of China)	827,852,637	429,158,710



# RESOURCES SALES CONTINUE TO IMPRESS

*Western Australian resources have helped improve the State's economic outlook.*

The value of the resources industry to Western Australia was reinforced through figures released at the end of 2010 projecting a sound State balance sheet propped up by mining revenue.

In releasing the 2010-11 Government Mid-Year Financial Projections, State Treasurer Christian Porter said a strong revenue performance had been particularly influenced by royalties from the iron ore sector.

Total public sector net debt levels were projected to be slightly lower than forecast in the May 2010 budget as a result.

Mr Porter said the Western Australian economy was expected to strengthen, with growth returning to about four to five per cent per annum.

"The projected growth reflects robust global demand for the State's resources, especially from key markets in Asia, and the sustained strength in global commodity markets has reinvigorated investment in major resource projects," he said.

Mr Porter said the Government net operating balance was forecast to be in surplus across all budgeted years.

"This stronger outcome is mainly due to higher iron ore royalties flowing from increases in prices and the State Government's decision to remove concessional royalty rates."

The resilience of the State's resources industry was also highlighted in the Department of Mines and Petroleum's Statistics Digest for 2009-10, which was released at the end of last year.

It recorded the sales value of the mining and petroleum sectors at A\$71 billion.

DMP Director General Richard Sellers said this was an outstanding achievement during a period of ongoing global uncertainty.

In 2009-10, mineral and petroleum exports accounted for almost 90 per cent of the State's income from total merchandise exports.

The digest reported Western Australia hosts an impressive 968 operating mine sites producing more than 50 different minerals, as well as 68 operating oil and gas fields.

"Importantly, all Western Australians benefit from the A\$2.8 billion paid in royalties to the State Government, which is used to fund services and facilities," Mr Sellers said.

*"The long-term outlook for Western Australia's mineral and petroleum sectors is very positive given the high number of significant projects under development."*

"The Department is working hard to ensure Western Australia is positioned as a destination of choice for responsible resources exploration and development and that the resources sector continues to grow to maximise long-term benefits to the community." ■

## FACTS AND FIGURES 2009-10

- WA's mineral and petroleum industry's value was worth A\$71 billion
- WA led the nation by contributing 42% (A\$83b) towards Australian merchandise exports
- Mineral and petroleum exports accounted for 89% of WA's total merchandise exports
- China was again WA's largest export market taking in 37% of total merchandise exports
- Iron ore is WA's largest sector and accounted for A\$33.7b of total sales, followed by petroleum at A\$18.8b
- A\$2.8b was paid in royalties to the State Government
- The Pilbara accounted for A\$35b or almost half of WA's total mineral and petroleum sales

# FUTURE GROWTH

## NEW LEADERS STEER BIG PROJECTS

From the top of Western Australia, where the Browse liquefied natural gas (LNG) project is located, through the Pilbara and Mid West regions with Gorgon and Oakajee, it's a big state, with big projects.

Leading the responsible development of Western Australia is a big task but, with a high calibre of leaders in place, including six newly appointed executives, it's a role the Department of State Development is well-equipped to perform.

Between them they speak several languages, have decades of experience in the resources sector and they're all looking towards a big year ahead –together, they're in charge of leading multi-billion dollar projects for the State.

Starting from the top of the state, the Browse LNG project to develop an LNG

processing precinct in the Kimberley is headed-up by Executive Director Michelle Andrews.

In the Pilbara, a new deepwater port and industrial precinct at Anketell and the development of Ashburton North near Onslow, into an LNG processing and industrial estate, will help transform the region. Leading these projects is Executive Directors Gary Simmons (Anketell) and Chris Clark (Ashburton North).

Off the Pilbara coast, is the A\$43billion Gorgon gas project, which, along with other strategically important projects, Executive Director Joe Ostojich is facilitating.

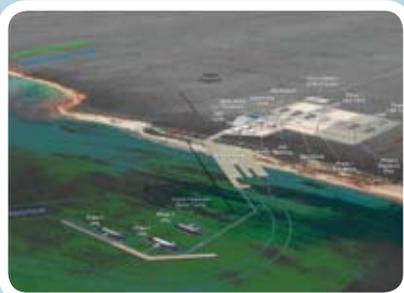
Leading the charge for the Oakajee Mid West Development project, another state-significant project and one set

to revitalise the Mid West region, is Executive Director Brett Sadler.

Big projects require big investment, and overseeing the Department's International Trade and Investment Division is newly appointed Director Nathan Backhouse.

Western Australia is set for a transformational year ahead, with investment in the state totalling billions of dollars, WA's trade figures steadily rising, and many key projects coming to fruition.

Here, we outline the state's big projects and hear from the newly appointed executives about what's in store this year.



### Browse Liquefied Natural Gas Precinct

About 300 kilometres off the Kimberley coast is the Browse Basin, which has estimated reserves of some 34.6 trillion cubic feet of gas and about 600 million barrels of condensate.

The State Government is developing an LNG precinct at James Price Point, north of Broome for processing the gas.

Western Australian Premier and Minister for State Development, Colin Barnett,

said the project would create thousands of jobs and position Western Australia as a world leader in LNG supply.

Browse Executive Director Michelle Andrews is working with the Commonwealth, State and Local Governments, the Kimberley Land Council and Traditional Owners, industry and community groups to facilitate the project.

Her priority for 2011 will be working with these groups to finalise the land tenure negotiations with the Traditional Owners, facilitate environment and heritage outcomes and help deliver social and economic benefits in the West Kimberley region.

With over 20 years' experience in environmental protection and approvals, she is looking forward to building her understanding of the drivers that shape development in WA, in particular commercial, legal, heritage and native title considerations.

"I am particularly interested in the Department of State Development's role in aligning private sector interests with public good outcomes," she said.

*"A key area of focus for me this year will be working with key players to ensure the LNG processing precinct on the Kimberley coast meets industry's needs and provides significant benefits to the region."*



## Anketell Port and Strategic Industrial Area

Near Cape Lambert in the Pilbara, 30 kilometres east of Karratha and some 10 kilometres west of Rio Tinto's existing iron ore operations, is the location for the proposed Anketell Port and Strategic Industrial Area.

A new development, Anketell is essential to the expansion of the Pilbara and will complement the existing Port Hedland and Dampier Ports while providing opportunities for new exports and the processing of iron ore and other commodities.

In his role as Executive Director, Project Facilitation, Gary Simmons is responsible for assisting industry in establishing resources and infrastructure projects in Western Australia, and oversees the management of the many existing State Agreement Acts that DSD has carriage of.

His current focus is on Anketell and facilitating the new deep water port and strategic industrial area on behalf of the State Government.

"This new development will ultimately provide for a multi-user and multi-commodity port," Mr Simmons said.

"Anketell will consist of a total land area sufficient to service a port handling 350 million tonnes per annum of bulk exports, together with the provision of industrial land to accommodate future development by third parties.

"The creation of the Anketell project will help deliver benefits to both the state and national economies, including creating employment

opportunities and bolstering the state's export capabilities to meet projected iron ore demand."

Mr Simmons has worked in the mining and petroleum industry for many years and enjoys the opportunity to help in building the future of the state through the development of resource projects.

"For me, 2011 is really going to be a challenging year in ensuring the state can assist industry, in particular the three potential users of the port facilities at Anketell – API Management, Fortescue Metals Group and MCC Australia Sanjin Mining," he said.

"It's about assisting them meet their project milestones as well as ensuring that the concerns and interests of underlying land holders and native title holders are taken into consideration.

"I have worked across many different facets of the mining and petroleum industries and my experience has placed me in good stead to help build a better WA by providing DSD with a level of expertise that will facilitate and establish resource projects."

## Ashburton North Strategic Industrial Area

Western Australia has a long history of mining and iron ore has played a dominant role in recent decades but increasingly, liquefied natural gas (LNG) is dominating resource development projects in the state.

Global demand for natural gas is expected to grow more quickly than that for oil or coal.

The Western Australian Government is creating a new strategic industrial area at Ashburton North for the development of natural gas projects and associated industries in the state's North West.

As Executive Director, Strategic Infrastructure, Chris Clark is focused on facilitating the project.

"The Ashburton North strategic industrial area is located 14 kilometres south-west of Onslow, in ideal proximity for use by industry for the development of gas from the Carnarvon Basin and Exmouth Gulf," he said.

"Covering an area up to 8,000 hectares in size, the Ashburton site will be large enough to accommodate major LNG developments as well as other prospective industries.

*"The industrial estate will include a multi-user port facility, land areas for proponents and infrastructure to accommodate LNG and hydro-carbon processing, and natural gas processing for the state's domestic gas supply."*

BHP Billiton Petroleum's A\$1.5 billion Macedon project will be the first venture to be established at Ashburton North.

"The Macedon project will supply domestic gas to the local market – Exxon Mobil along with BHPB are also considering using the site to develop their Scarborough discovery," Mr Clark said.

"Chevron is currently investigating Ashburton to commercialise its Wheatstone gas discovery, and remaining land at Ashburton will be used for complementary industry."

Mr Clark will work with these companies and other government agencies to coordinate land acquisition, land use and structure planning, as well as the provision of infrastructure for the projects and tenure processes.

"We'll continue our negotiations with potential proponents and oversee land use planning for the port and strategic industrial area, including legal negotiations, commercial investigations and engineering studies," he said.

"The Ashburton North project is a major infrastructure project for the development of the Pilbara region and is destined to become one of WA's most important export facilities."

Final investment decision for Chevron's Wheatstone project is expected mid year, with construction to commence early in 2012 and first gas planned for 2016.





## Oakajee Mid West Development Project

Oakajee is a large-scale, multi-billion dollar project to establish an integrated port, rail and industrial estate in the Mid West, about 25 kilometres north of Geraldton.

Considered the single most important project for Western Australia's economic development over the next 50 years, both the State and Federal Governments are investing in the common use infrastructure for the port, with Oakajee Port and Rail Pty Ltd (OPR) the infrastructure provider for the project.

Executive Director Brett Sadler is keenly focussed on facilitating the project to ensure it provides for the long term needs of the Mid West region and it meets the government's investment objectives.

"The Oakajee project includes major infrastructure developments, including a multi-user port, an expanded rail network and an internationally competitive strategic industrial estate," he said.

"It will create the state's second major iron ore province and, by creating a world-class industrial estate, it will support the development of the resources sector in the Mid West and help ensure the long-term prosperity of the region.

*"Preliminary studies indicate a peak of about 2,000 jobs across port and rail during construction and up to 300 jobs once operational. There'll also*

*be flow-on effects for other industries, including construction, materials and transport, as well as for recreational and retail industries."*

The Western Australian Government signed a State Agreement with OPR in March 2009. Once a bankable feasibility study is completed and financial close is achieved, construction is expected to commence in 2012 and port operations in 2015.

With implementation agreements to be negotiated with OPR, approvals facilitation, and Oakajee-related legislation to be drafted and progressed through Parliament, Mr Sadler is looking forward to a big year.

"I worked in the energy policy area in the WA Government for over 10 years and was keen to work in other areas on large, exciting projects," he said.

"I enjoy working in the public policy area, and I enjoy the challenge of working on complex projects."

## Strategic Projects

As the Department of State Development's newly appointed Executive Director, Strategic Projects, Joe Ostojich is responsible for delivering major private sector projects that are strategically important to Western Australia.

Mr Ostojich joined the Department not long after it was established at the beginning of 2009, and was instrumental in securing the agreements and approvals for the Gorgon Joint Venture gas processing project, located on Barrow Island off the Pilbara coast.

Along with facilitating the Gorgon Project, key projects on Mr Ostojich's agenda for 2011 include:

- completion of the Roy Hill Infrastructure project
- plant commissioning and the shipment of first ore later this year for the Citic-Sino project

- completion of the various requirements for the building of facilities on Barrow Island for the Gorgon Gas Project
- reaching a final investment decision that will allow Perdaman Chemical and Fertilisers to construct a urea plant in Collie
- facilitation of the Yeelirrie uranium mine
- facilitating the development of BHP Billiton's outer harbour project
- planning for the development of Fortescue Metals Group's Western Hub Solomon project.

Of strategic importance to the state, these key projects will see the further development of Western Australia's resources sector, delivering thousands of employment opportunities and developing the state's infrastructure.

Mr Ostojich considers being part of the Department of State Development the 'best role in government'.

"It's a real privilege to have an impact on the way these major projects develop," he said.

*"It provides me with the opportunity to develop a balance between ensuring an optimum outcome for the project and for it to work in the best interest of the state."*



## Trade and Investment

With an abundance of natural minerals and resources, Western Australia has seen the development of huge resource projects and many global companies have a presence in the Western Australian economy, with overseas investment in the state welcomed.

Big resource projects have led to big export figures and in December 2010, WA exports exceeded A\$100 billion for the first time, accounting for a record 44.2 per cent of national exports.

The Department of State Development is the WA Government's lead agency for international trade and investment in Western Australia.

Coinciding with the state's multi-billion dollar exports milestone, the Department welcomed new Trade and Investment Director, Nathan Backhouse in December.

Previously the Director of Trade Policy and International Affairs with the Australian Chamber of Commerce and Industry in Canberra and the Chief Executive Officer of the International Chamber of Commerce in Australia, Mr Backhouse's focus is global while championing trade and investment opportunities for the state.

"Essentially, our role is to actively assist local Western Australian businesses and investors to capitalise on trade and investment opportunities," Mr Backhouse said.

*"Our aim is to drive economic growth by facilitating exports, attracting investments, building relationships and promoting Western Australia internationally."*



Western Australia's global network comprises of 10 international offices located in the state's key trading regions, including China, Europe, India, Indonesia, Japan, Malaysia, the Middle East and South Korea.

"Our team is made up of market development and investment specialists that come from diverse cultural and professional backgrounds. We assist Western Australian companies seeking business opportunities overseas and facilitate foreign investment into the state," Mr Backhouse said.

"We offer an ideal first point of contact for Western Australian companies exploring export opportunities and international companies considering investment in Western Australia."

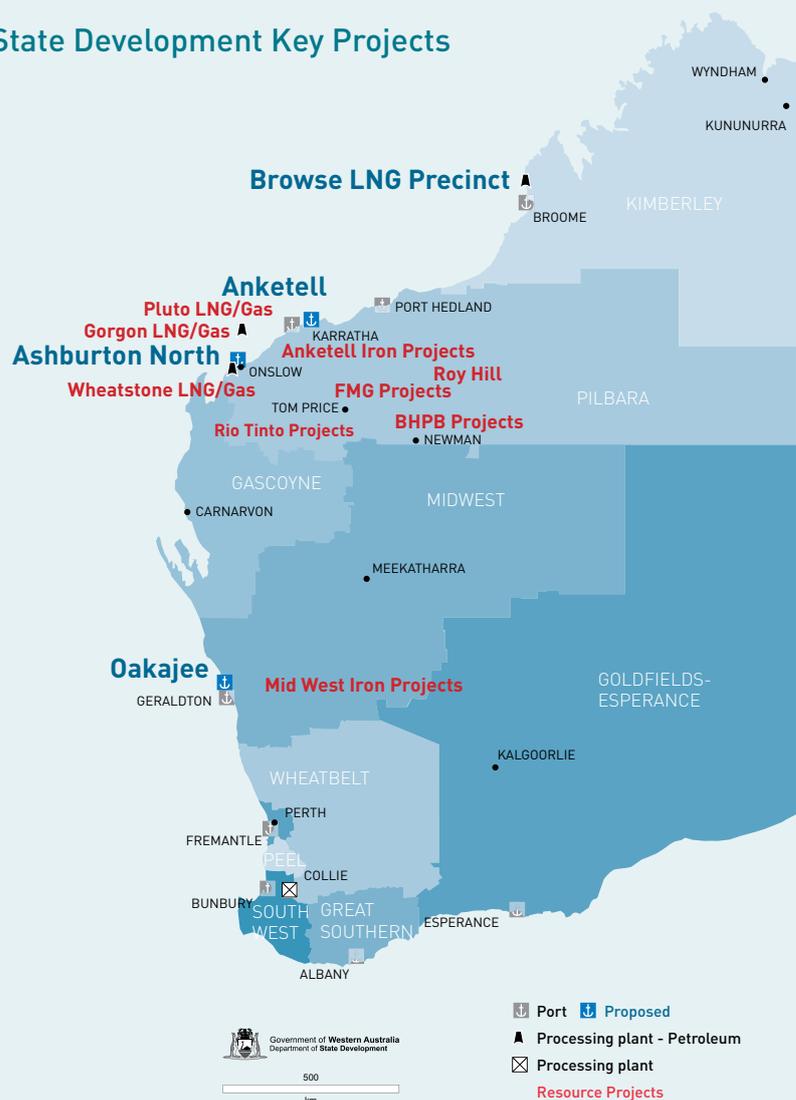
With regular trade delegations and foreign dignitaries visiting Western Australia, Mr Backhouse is looking forward to a busy year ahead.

*"One of the highlights for 2011 will be the Commonwealth Heads of Government Meeting – CHOGM – in October."*

"CHOGM is a great opportunity for us to showcase Western Australia to an international audience, with the leaders of 50 nations visiting our state, including some of our key trading partners," Mr Backhouse said.

"There's a wealth of opportunity in Western Australia. There are big projects in development here – we're focused on attracting investment in Western Australia and maximising the benefits for Western Australians." ■

## State Development Key Projects





*Perth is emerging as a significant hub for the resources sector with a growing number of companies locating their head offices in Perth.*

# PERTH: ON THE RISE

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The power of Western Australia's resources industries is reflected not only in the State's strong economic performance, rapid population growth and spectacular export figures, but also in the emergence of its capital city, Perth as a significant hub for the global resources sector.

Growing numbers of energy, mining and related services companies are locating in Perth, in some cases moving their national and regional head offices.

At the same time local companies are expanding in their size and numbers and in the reach of their operations, increasingly developing, managing or servicing exploration and mining projects in locations across the globe.

While Perth's prosperity is very closely linked to resources, there is great strength in the diversity of this sector, which may be unmatched anywhere in the world.

More than 50 minerals are produced in commercial quantities and more significant exports include iron ore, liquefied natural gas (LNG), condensate and crude oil, alumina, gold, ores and concentrates of nickel, copper and other precious, specialty and base metals and, mineral sands products.

Global mining giants BHP Billiton and Rio Tinto are long established in Perth, primarily as iron ore producers, but also with interests in petroleum, nickel, alumina and uranium, and diamonds and salt respectively.

Others, including miners and mineral processors Alcoa, Barrick, Cliffs Resources, Newmont Mining, Xstrata and petroleum giants, Apache Energy, Chevron Corporation and Shell, are among those with a significant presence.

In recent years, Indian copper miner the Aditya Birla Group and Hong Kong's Citic Pacific have also established regional head offices in Perth and other Chinese companies are forming joint venture operations with Australian partners.

They are part of a resources industry that also includes home grown success stories such as Fortescue Metals, Hancock Resources, Iluka, Minara Resources, Talison Lithium, The Gold Corporation, Woodside Energy and hundreds of smaller mineral and energy explorers, developers, producers and processors.

Similar diversity of size, specialisation and origin characterises the related services and contracting industries with many global firms represented.

Among many engineering, construction, project management, ITC, accounting and legal firms, global companies such as Worley Parsons and Halliburton have a substantial presence, the latter basing its Australian head office in Perth.

With 64 operating oil and gas fields and 90 per cent of Australia's conventional gas reserves off the coast of Western Australia, offshore activity and world class infrastructure—such as the Australian Marine Complex—has fostered the development of a substantial subsea engineering and services hub and the State is increasingly attractive as a base for international companies.

While not comprehensive, the Western Australian membership of the sector's peak organisations provides an indication of the level of corporate activity.

Chamber of Minerals and Energy (WA) says its 100 member companies, including explorers, developers, producers and contractors, represent about 90 per cent of the State's mineral and energy production. A similar number of associate members are organisations primarily involved in providing services to the sector.



The Association of Mining and Exploration Companies (AMEC), an advocacy body for mineral exploration and mining companies, has 130 members and 95 associate members based in Western Australia, and the Australian Petroleum Production & Exploration Association Ltd (APPEA) has 40 Western Australian based members and another 135 associate members.

Minerals driven growth is not unprecedented in Western Australia's history—resources development has previously triggered significant economic and population expansion phases—but, the scale and depth of the current period of sustained growth may yet prove to be unparalleled.

Over the decade to 2010, the value of private capital investment in the State's resources sector totalled A\$109 billion, and the sector's annual output trebled to more than A\$70 billion.

Employment in mining and energy also trebled and the construction workforce more than doubled.

With major new investment projects, underway and planned, valued at A\$170 billion, and export earnings increasing dramatically, these trends will be sustained.

Over the past decade, Perth's population grew at an average rate of 2.2 per cent annually, well above Australia's 1.55 per cent average.

The resources presence permeates the city, from tall office towers in the central CBD, to research and training centres at its universities and specialised businesses and industries throughout the metropolitan area.

It is an important employment generator for the city, both directly, through Perth based management, professionals and support staff, and employees regularly flying in to and out of resources and construction jobs across the vast State, and indirectly in the employment and business it generates across all other industry sectors.

The sector is also an important contributor to the city's cultural and community life, prominent in sponsoring and supporting theatre, arts, sport and community based development and environmental activity.

Recent research, published as FACTBase bulletins (see box on Committee for Perth: New dynamism) by Professor Matthew Tonts and Drs Paul and Veronica Huddlestone from the University of Western Australia's School of Human Geography,

demonstrates the significance of mining and energy activity to the city's economic base.

According to a location quotient calculated by Professor Tonts, Perth's resources sector is twice as important to Perth's economy than any other sector.

The researchers identify Perth as Australia's third most significant corporate power centre, with more than 40 per cent of firms listed on the Australian Stock Exchange based in Western Australia, including half of the 220 listed energy companies.

They identify that Perth with a specialised yet diverse resources driven economy, has significant advantages as a location for corporate headquarters.

*“Perth has significant advantages as a location for corporate headquarters.”*

As well as its proximity to resources and to growth markets, it offers a concentration of resources enterprises, business services and a critical mass of skilled and professional people, and access to strategic and specialist information to support decision making. ■

## Changing city

Sam Walsh is Rio Tinto's Chief Executive, Iron Ore, covering mines in Western Australia, Canada, India and Guinea, with Rio the world's second largest producer of seaborne iron ore exports.

He explains why Rio Tinto has based its global production and marketing iron ore operations in Western Australia.

“Perth is the most convenient location, it works best for us,” Mr Walsh says.

“We are in the same time zone as our largest and fastest growing markets and we are only an hour or two from the heart of our operations in the Pilbara.

“We are able to keep in close touch with what is happening up there, and what is happening closer to home.

“To continue to attract the best people, the bright people, who can choose where

they want to work, we need to offer real benefits, somewhere they can want to come to and want to stay.

“When we established an Operations Centre to manage our complex and integrated rail, port and mine systems, the choice was easy: base it in Perth, out next to the airport, making a virtue of the centrality of the location.

“We now have more than 400 people out there, and many of them are there because, while they might have wanted to leave the Pilbara, they did not want to leave Rio Tinto, or mining.

“They wanted to live in Perth for all the reasons you can imagine: schools, lifestyle, convenience, access to care, family.”

Mr Walsh, the foundation chairman of the Committee for Perth, is also strong advocate of business support for culture and the arts in Perth.

“The liveability of Perth is important to Rio Tinto, if we are to compete for the best talent, and that's why I took a stand early in favour of loosening up some of the more restrictive trading laws.

“This city is changing fast, and for the better, becoming more lively and with more entertainment options on offer.

“Entertainment, culture and arts has to be varied, exciting, challenging at times and available. That's Perth nowadays.

“The ripple effect from the more vibrant arts sector, the restaurant and bar scene, the festivals such as Perth International Arts Festival means that everyone benefits.

“Add that to the positives we have long had—the beaches, the stunning asset which is Kings Park, our weather—and you've got yourself a bankable, liveable proposition.”

## Global hotspot

Ann Pickard is Country Chair, Shell in Australia and Executive Vice President, Upstream Australia.

Shell's Australian operations employ more than 2,500 people and include petroleum exploration and production, refining and marketing.

Upstream activities include exploring for and developing gas resources for export and domestic supply, off the coasts of Western Australia and the Northern Territory, and from coal seam gas opportunities in Queensland.

Ms Pickard has been based in Perth since coming to Australia in March 2010.

"Western Australia is on the map globally as a hotspot for oil and gas activity," she said.

*"So, given the size and weighting of our investment program in Australia and the global and country connections, it makes sense to do business from Perth."*

"Our JV partners are in Perth, key stakeholders are in Perth and we are in close proximity to key markets.

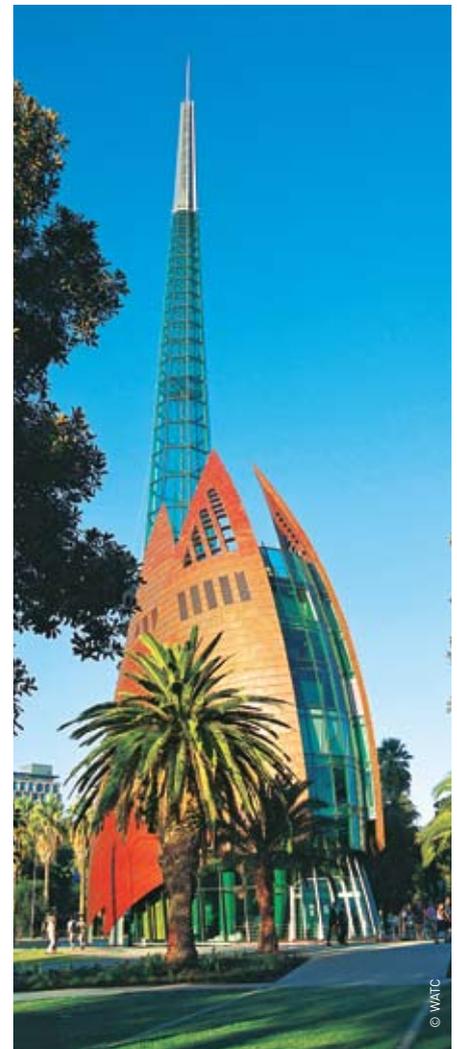
"As well as that you have the fantastic amenity and lifestyle of WA—one that really suits me—and that is an important employee value proposition.

"While I say I live in Perth, sometimes, it feels like I really live on Qantas (the national airline)! Thank goodness it just got the best rating for wine of all airlines!

"But, seriously, over time I think the geographic advantages of Perth will continue to see it develop as a business hub for the resources industry globally.

"I think in twenty years time Perth, Sydney, Brisbane and Melbourne will be seen as the Australian global cities.

"And Perth, like Brisbane, is quintessentially Australian... at least to an American."



## New dynamism

The growth of Perth as a centre for corporate decision making, skills and technology related to the resources sector is providing prosperity and a new dynamism.

This has presented opportunities, which have brought together businesses and civic leaders to work for the sustainable development of Perth as a metropolis of rich cultural diversity, economic prosperity and world-class amenities.

The Committee for Perth was established in 2006, with strong support from leading resources companies and seed funding provided by the then Department of Industry & Resources.

Chief Executive Officer Marion Fulker said that there is a strong corporate interest in Perth's development, from both employers and investors.

"Our focus is to secure a long term sustainable future for Perth as a major resources city in Australasia," Ms Faulker said.

"To do this we need to offer the jobs and living experiences that will attract and retain highly skilled people, to keep industries competitive and ensure the success of the massive projects that are getting off the ground.

"Making the city more vibrant and welcoming to high end workers, who might come from a diversity of cultures and countries is an important issue.

*"Perth is beautiful, and ranks highly among the most liveable cities in the world."*

*"It offers a high standard of education and health services, cultural events and recreational activities."*

"But employers are competing in a global market for staff who might have opportunities in some of the world's greatest cities. We have to be able to deliver what we promise them.

"Equally, we want to keep highly talented young Western Australians here, or attract them back after they have gained experience interstate or overseas.

"A key to this is increasing public understanding of the scale of the opportunity presented by Perth's unique role as a hub both for the mining and the energy sectors and building support for changes that will help make it happen."

Through FACTBase, a joint venture with the University of Western Australia, the Committee For Perth has commissioned and is publishing research and discussion papers focusing on issues affecting the development, liveability and global connectedness of Perth. These are available from the Committee's website [www.committeeforperth.com.au](http://www.committeeforperth.com.au)

# NEW GEOLOGICAL DISCOVERIES

Recent surveys of the Eucla and Gascoyne Complex provide fascinating geological insights set to benefit Western Australia's resources industry.

The Geological Survey of Western Australia (GSWA) has recently released new data that will help encourage long-term resources exploration in the state.

Mines and Petroleum Minister Norman Moore said the new data was collected from recent regional surveys of the Eucla and the Capricorn Orogen (including the Gascoyne Province) and would be an important tool for industry.

"The release of new data is great news. Studies such as these lessen exploration risk in remote, underexplored parts of WA and can encourage further exploration and future discoveries," he said.

A major program of deep crustal seismic traverses was completed with the acquisition of six lines stretching across more than 1,200 kilometres - from near Tom Price, in the Pilbara, to the Capricorn Orogen and the Narryer and Youanmi Terranes of the Yilgarn Craton to end near Leinster.

The images of the Capricorn Survey and the unprocessed data will give new insight into the make-up of the state's crust and the nature of major fault zones.

The Capricorn deep crustal seismic reflection survey began in the Hamersley Ranges near Tom Price.

The survey investigated the structure of the earth's crust from the Pilbara's Hamersley Ranges, through the Gascoyne and into the Mid-West, passing through Western Australia's rich iron ore, copper, lead and gold regions.

Mines and Petroleum Minister Norman Moore said understanding the earth's crust was crucial to the resource exploration industry because the data could identify potential commercial ore bodies or petroleum deposits.

"This invaluable geological data will also link the two oldest pieces of crust in Australia (the Pilbara and Yilgarn cratons), and provide clues on how plate tectonic processes moved continents around earth's surface more than two billion years ago," he said.

The Pilbara and Yilgarn Cratons were parts of two ancient continents, originally separated by an ocean, and were brought together by a series of continental collisions that took place between 2.2 and 2.0 billion years ago.

Airborne magnetic and radiometric surveys were also completed covering the Eucla Basin up to the Western Australian border with South Australia.

The survey covers the Eucla Basin at half the usual spacing of other regional surveys.

The data gives a detailed picture of Proterozoic basement rocks buried beneath sand and the relatively thin Cenozoic limestones of the Nullabor Plain.

"Ongoing geophysical programs, funded by the State Government's Royalties for Regions' funded Exploration Incentive Scheme, have given us fascinating new images that will benefit industry," Minister Moore said.

"By focusing on areas of poorly understood geology, the GSWA strives to deliver new geoscience data as well as modernise and expand existing information.

"EIS programs aim to develop mineral system studies that are effective in generating new exploration targets, particularly under soil and thin sedimentary basin cover."

Images and data grids of surveys can be downloaded from the Regional Geophysical Surveys page of the GSWA website at [www.dmp.wa.gov.au/geophysics](http://www.dmp.wa.gov.au/geophysics) ■



*Mines and Petroleum Minister Norman Moore, Senior Geophysicist-Geologist Catherine Spaggiari and Assistant Director, Geoscience Mapping Ian Tyler at the 2011 Geological Survey Open Day.*

# WA TO HOST WORLD LEADERS: CHOGM 2011

Western Australia is gearing up for the biggest international event to be held here this century.

CHOGM 2011 will see up to 4,000 international delegates and media from more than 50 nations descend on our state in October this year.

The event will thrust Western Australia into the international spotlight and is expected to have a direct economic impact of A\$42.5 million from additional expenditure in the state from visitor spending and Australian Government investment in logistics for the event.

## **What is CHOGM?**

CHOGM is the abbreviation for the Commonwealth Heads of Government Meeting, which in recent years has become a biennial summit meeting for the Heads of Government from all Commonwealth nations.

With the first CHOGM held in 1971, the Western Australian meeting will see the event mark its 40th anniversary, although the meetings can claim a

history dating back to the First Colonial Conference in 1887 and consequent meetings held between the leaders of the British Empire's self-governing colonies.

Every two years, CHOGM is held in a different member state and is chaired by that nation's Prime Minister or President. As the Head of the Commonwealth, Her Majesty Queen Elizabeth II has attended CHOGM since 1997.

Over the past half century, the Commonwealth has grown from eight members in 1949 to 54 member nations in 2010 that span six continents and oceans from Africa to Asia, the Americas, the Caribbean, Europe and the South Pacific.

CHOGM provides an opportunity for Commonwealth leaders—who represent more than two billion citizens—to discuss global and Commonwealth issues and to agree on collective policies and initiatives.

CHOGM will be held in Perth and will run for one week from 28 to 30 October 2011, with the Leaders' meeting running for three days.

The Leaders' meeting consists of an opening ceremony, executive session meetings and Retreat sessions. The Retreat is the centrepiece of CHOGM and will be held at Frasers in Kings Park, with the Frasers complex being expanded for the event.

## **What's in it for WA?**

CHOGM is the highest consultative and policy-making mechanism of the Commonwealth. Western Australian Premier Colin Barnett has described CHOGM as 'the biggest event to hit Perth since the America's Cup'.

"In terms of international significance, Perth's hosting of the Commonwealth Heads of Government will be of the scale of the America's Cup and the Commonwealth Games," the Premier said.



Premier Colin Barnett and Prime Minister Julia Gillard toured the Kings Park CHOGM summit site in January. CHOGM will be the biggest international event Western Australia has hosted.

"This will put WA and Perth at the centre of world affairs.

*"For Western Australia it gives us the opportunity to show what we have to offer as an economy and as a people. It's a rare and unique opportunity to promote WA throughout the world, particularly in Southern Asia and the African-Indian Ocean Rim."*

In hosting CHOGM, the State and Federal Governments are planning a Commonwealth Festival to coincide with the meeting and showcase Perth, which will include artistic, cultural, sporting and school events.

CHOGM is considered a major coup for Perth and for Western Australia with many infrastructure projects to be completed in time for the event, tourism dollars to be spent by overseas visitors and the state showcased to an international audience, creating potential business and investment opportunities.

The Commonwealth includes a quarter of the membership of the G20, the premier body for global economic governance.

It also represents one fifth of total global trade. Trade with Commonwealth partners represents A\$89 billion (22 per cent) of Australia's global merchandise trade.

The Premier has announced that in addition to current estimates of visitor spending during CHOGM totalling more than A\$40 million, the Federal Government will inject funds into the state towards venues, accommodation, security and delegate functions, dinners and receptions.

"This investment reinforces the significance of this event to Western Australia," Mr Barnett said.

"This will be the largest international event of its kind ever held in Australia. With leaders from more than 50 nations visiting Perth, including some of our major trading partners, it is important we offer them a truly memorable meeting experience.

"It will be an opportunity for Perth to be centre stage and is a great chance to show our capital at its very best."

The Department of State Development is working with other government agencies and the WA CHOGM team to help coordinate the state's role in the event.

"The State Government will continue to work to maximise benefits for local businesses and the community," the Premier said.

"The most important legacy of CHOGM will be the political, business, trade and cultural links created with world leaders and international visitors, who will, hopefully, carry back to their respective countries an unforgettable impression of Western Australia." ■

# TRANSFORMING THE PILBARA

Western Australia's Pilbara region is entering a new era of transformation.

To help secure the region's status as one of the nation's key economic centres for the long term, the State Government has developed a new planning framework to guide development in the Pilbara.

The draft Pilbara Planning and Infrastructure Framework, released for public comment in March, focuses on some of the challenges and the many opportunities facing the region.

"The sustainability of the Pilbara region will be determined by the strengths of its communities; the liveability of its towns; appreciation of the region's natural and cultural values; economic diversification and self sufficiency; and the level of services the region can attract," Planning Minister John Day said.

*"The Pilbara region is important to both Western Australia and the nation. It has great possibilities for major development and is on the threshold of another period of significant expansion."*

"This framework will help to ensure development and change over the next 25 years is achieved in a way that improves people's lives and enhances its unique character and environment.

"By 2035, we expect a resident population of about 140,000 from a more diverse economy that has capitalised on the region's competitive advantages.

"This framework will address the scale and distribution of future population growth, housing development and priority infrastructure needs for the next five years.

"With infrastructure capacity a significant inhibitor to urban development in some towns, the framework will guide government on infrastructure priorities across the Pilbara and give the private sector more confidence to invest in the region.

"Strategies for economic growth, environmental issues, transport, infrastructure, water resources, tourism and the emerging impacts of climate change are also identified in the framework."

Regional Development Minister Brendon Grylls said the framework linked into the State Government's Pilbara Cities initiative, which seeks to expand the region's resident population and to rectify infrastructure inadequacies with the development of Karratha and Port Hedland into cities.

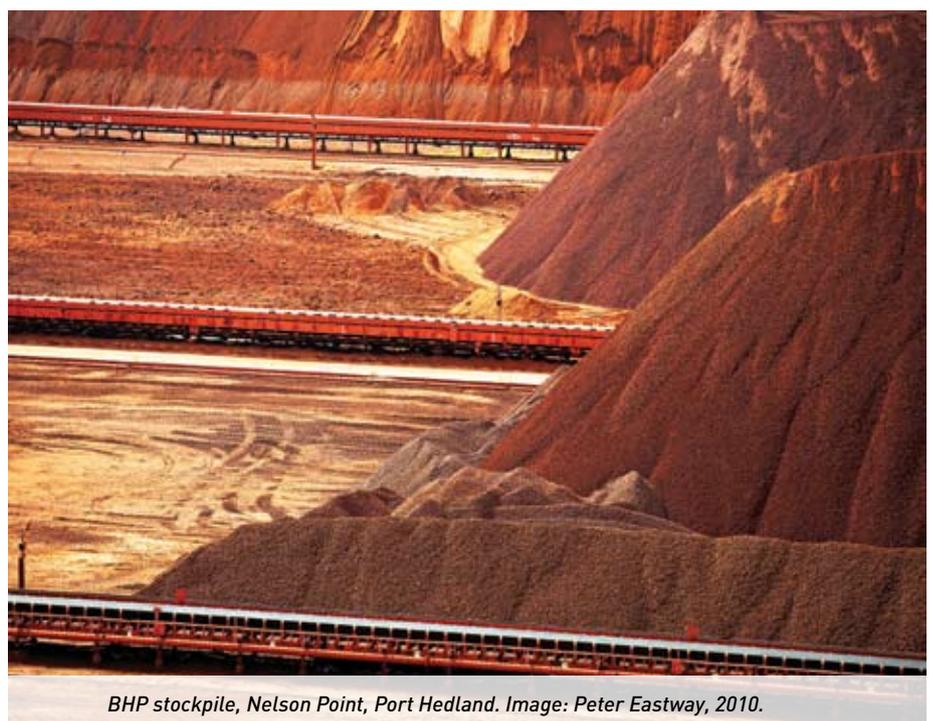
"The framework sets the broad future planning direction for the Pilbara region and will help make the Pilbara a better place in which to live, work and invest," Mr Grylls said.

"More affordable housing, greater housing choice and access to higher standards of education, health, recreation and other community services will result in many fly-in fly-out workers choosing to live in the Pilbara on a more permanent basis.

"Importantly, the Pilbara's natural and cultural heritage assets, such as Karijini and the Burrup Peninsula's rock art will be conserved and celebrated under the framework."

A 60-day comment period is open on the draft framework and closes May 9, 2011. The final version is expected to be released later this year.

The document can be downloaded from [www.planning.wa.gov.au](http://www.planning.wa.gov.au) ■



BHP stockpile, Nelson Point, Port Hedland. Image: Peter Eastway, 2010.

# ONLINE TITLE PUBLISHING MAKES ACCESS EASIER



DMP has acted on industry advice and provided an online register of mineral title applications.

Finding out about mineral title applications is now just a click of a button away, thanks to a new web program.

The Department of Mines and Petroleum has become the first regulatory agency in Australia to use its website to notify the public of mineral title applications it receives.

The pilot program began in February and is the latest in a series of technological advancements aimed at making the resources approvals system more timely and transparent for industry and the public.

Information about mineral title applications was previously only available through newspaper advertisements, paid for by the applicants – now anyone with internet access will have the ability to access the information.

DMP Director General Richard Sellers said it was another example of the Department taking its commitment as a lead agency in the resources sector seriously.

"Integrating the direct publishing of mineral title applications into the Department's website is an Australian first," Mr Sellers said.

"The program will run for three months and at the end of this period we will seek feedback from industry and other stakeholders."

*Mr Sellers said that over time the information would form a historic database and create a significant source of information regarding mining activity in Western Australia, all from one portal.*

The program was initiated by the Mining Industry Liaison Committee (MILC), and developed and adopted by DMP.

Paid newspaper advertisements will continue for the length of the pilot program.

The development follows DMP's introduction of online lodgement and payment options for key approvals during the past two years.

Program of Works, mining proposals and project management plans were added in the third quarter 2010, while petroleum payments followed in the fourth quarter.

Departmental analysis has shown that assessment timelines for online applications is less compared to equivalent paper transactions, with time savings of up to one week for proponents.

DMP's fourth quarter approvals performance consolidated a positive approvals performance for the calendar year 2010, despite the total number of mining, petroleum and geothermal applications received climbing from the previous year.

The Department received 2,293 Program of Works applications, of which 94 per cent were approved within the 30 business days timeline target.

During 2009, DMP received 1702 applications, also with a 94 per cent compliance rate.

In the fourth quarter, DMP achieved 100 per cent compliance for assessment of petroleum pipeline, wells, surveys and environment plans within the targeted time. ■

For information on Mineral Titles, visit [www.dmp.wa.gov.au](http://www.dmp.wa.gov.au)

# THE PILBARA PROJECT

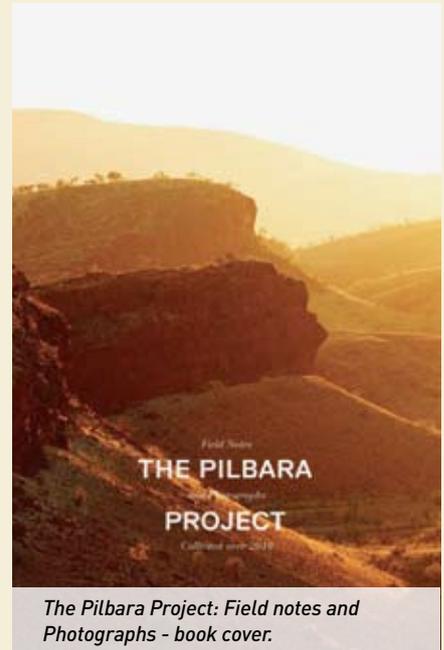
Over the past year, a team of creative talent has journeyed into Western Australia's Pilbara region and the result is a stunning exhibition that explores the interconnection between the land and the dominant industry of the region—presenting a refreshing view of the Pilbara landscape.

With an amazing team of photographers—including Dr Les Walking, Tony Hewitt, Christian Fletcher, Michael Fletcher and Peter Eastway—the group has traversed the Pilbara under the direction of William L. Fox, Director of the Center for Art + Environment at the Nevada Museum of Art and Western Australia's driving force of creativity, FORM.

The exhibition is the beginning of a long-term project which will evolve over several years in partnership with BHP Billiton.

A book is available to accompany the exhibition (available through FORM on +61 8 9226 2799 or mail@form.net.au) and a short film documenting the field trips can be viewed at [www.thepilbaraproject.com](http://www.thepilbaraproject.com)

Become part of the Pilbara Project.  
To view some of the images in the journey so far, and for further information, visit [www.thepilbaraproject.com](http://www.thepilbaraproject.com)



Railway tracks, Port Hedland. Image: Peter Eastway, 2010



Industrial lines, Nelson Point, Port Hedland. Image: Peter Eastway, 2010.

# BHP BILLITON INVESTING IN WA'S FUTURE WORKFORCE



As Western Australia enters a period of super-growth, with the State's resources sector generating significant investment activity and A\$170 billion worth of projects either underway or in the pipeline, one of the challenges the State faces is finding high numbers of skilled workers.

In a move that benefits industry and the bigger picture—the future development of Western Australia—BHP Billiton Iron Ore has instigated a number of programs to increase Indigenous employment in the resources sector.

The company has formed strong relationships with the Indigenous communities in which it operates.

Currently, about 900 Indigenous people are employed at its operations across the Pilbara – including directly employed by the company and those employed by contractors who provide services to BHP Billiton Iron Ore.

The company's Sustainable Indigenous Relationships Program is focused on long-term, proactive programs centred around employment, education and contracting.

BHP Billiton Iron Ore Indigenous Affairs Manager, Chris Cottier said the company invested financial and strategic support into a range of educational programs designed to improve graduation levels, attendance, behaviour, teacher retention, literacy and numeracy.

"Since 2009, about 40 students have secured primary, secondary or tertiary BHP Billiton Indigenous Scholarships and we hope to reach a target of 80 students participating in our programs by 2012," Mr Cottier said.

The company is supporting Indigenous students to study and complete their schooling and, together with the Graham (Polly) Farmer Foundation's Follow the Dream initiative, students receive additional tuition and mentoring before and after school.

*"Twenty-one Indigenous students from the Pilbara who participated in the program have gone on to attend university with another 27 taking on vocational training and six directly employed," Mr Cottier said.*

In conjunction with Ngarda Civil and Mining, BHP Billiton Iron Ore launched the Purarrka Indigenous Mining Academy (PIMA) in October 2008.

The academy, located at the Yarrie mine in the East Pilbara, delivers sustainable training and development for Indigenous communities throughout the region.

"PIMA supports Indigenous people from remote communities who want to make a change in their lives and take advantage of employment opportunities within Western Australia's mining industry," Mr Cottier said.



© BHP Billiton

*Trainees at Purarrka Indigenous Mining Academy located at BHP Billiton Iron Ore's Yarrie Mine.*

“Annually, PIMA runs three training courses with up to 20 participants. To date, six courses have been completed with a seventh beginning in February.”

BHP Billiton Iron Ore also works with Apprenticeships Australia to create opportunities for Indigenous trainees and apprentices. Up to 60 Indigenous trainees and apprentices are employed across the Newman and Port Hedland operations.

The company is also committed to increasing Indigenous employment opportunities with contractors and local businesses – together with Pindan College, the company works to ensure more young Indigenous people gain access to traineeships and apprenticeships with the company's contractors.

The company has also joined forces with Indigenous organisation Bloodwood Tree Association Inc. to provide opportunities for traineeships and apprenticeships in the hospitality industry.

BHP Billiton Iron Ore estimates that these two partnerships will lead to 70 employment and training opportunities for Indigenous people over a four-year period.

Along with these education initiatives, further opportunities for Indigenous employment have been created through the company's innovative approach to Indigenous contracting.

The company has developed Indigenous Contracting Guidelines that help Indigenous contracting businesses better understand BHP Billiton Iron Ore's approach to identifying and assessing business opportunities for contractors.

“Through the implementation of these guidelines the company has assisted Indigenous contracting businesses to not only become sustainable but also autonomous through the growth and creation of opportunities in markets outside BHP Billiton Iron Ore,” Mr Cottier said.

“Indigenous contracting companies are now a major stakeholder of the BHP Billiton Iron Ore business with Ngarda Civil and Mining operating the Yarrie mine operations for the company.

“This contract alone is worth A\$300 million—the largest contract of its kind in Australia.”

The Yarrie mine is a fully productive mine site employing up to 80 people to operate the mine.

Several other Indigenous companies provide services through 13 contracts to BHP Billiton Iron Ore including Pilbara Logistics, which provides waste management and civil works contracts for the company in both Newman and Hedland.

With a range of programs in place, the company aims to reach students at every educational stage and help create a pipeline to employment.

“As a major employer we recognise that creating a skilled workforce is important to the company's future workforce and that of Western Australia's skilled labour market,” Mr Cottier said. ■

# COCKBURN CEMENT

## A STRONG FUTURE

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For more than 55 years the Cockburn Cement Limited plant, 25 kilometres south of Perth, has helped provide important foundations for Western Australia's economic development.

Established in 1955 to manufacture cement, during a period of significant industrialisation and population growth, from 1972 the facility at Munster also became a quicklime producer.

Today the company owned by Adelaide Brighton Limited, estimates that it produces 65 per cent of the cement consumed in Western Australia and almost all the quicklime used by the state's diverse minerals processing export industries.

Now, with the Perth metropolitan area growing rapidly, residential encroachment on the facility is creating new challenges, but a recent decision by Western Australia's Parliament has secured the plant's operations for another 20 years.

Cement production began in 1955 using limestone, an abundant resource on Western Australia's coastal plain.

The limestone, along with shell sands, bauxite, iron oxides and shale, is ground and mixed in a slurry with water. This is dried in rotary kilns and heated up to 1400oc so that the components fuse into nodules, called clinker.

The plant has an annual capacity to produce 550,000 tonnes of clinker which is then reground with gypsum to produce Portland cement for a range of residential, industrial and infrastructure construction.

Cockburn Cement's Western Australian operations manager Darrin Strange says the plant's range of cement products includes "low heat" products suited to heavy uses, extreme conditions and marine environments.

"The State's new A\$2 billion Fiona Stanley Hospital is one of a wide range of residential, commercial and civil infrastructure projects that our cement is helping to build," Mr Strange said.

*"In the resources sector, customers include Chevron's Gorgon and Woodside's Pluto LNG processing facilities, CITIC Pacific's Sino Iron Ore project at Cape Preston, BHP Billiton's massive expansion of its iron ore operations, and underground mines throughout the State.*

"In all, we supply cement to 137 different operations across Western Australia including many which are pre-mixing concrete for other customers."

Mr Strange said the company's development of quicklime production in the 1970s was a significant advance for the company and for the Munster plant, which is currently the largest fully integrated cement and quicklime plant in Australia.

The plant can produce up to 900,000 tonnes of quicklime, or burnt lime, annually, most of which is used by mineral processing industries particularly alumina and gold producers, but also by a range of other industries, primarily to modify pH levels, but also by alumina producers to retrieve caustic soda from processing waste.

The raw material for Cockburn Cement's quicklime production is minute

fragments of sea shells, which over millions of years have produced banks 10-15 metres deep of shell sands in the shallow waters of nearby Owen Anchorage.

The sands, which are essentially calcium carbonate, are retrieved by a suction dredge, loaded and transferred to an onshore facility at Woodman Point, where they are washed to remove salt and silt, then pumped 5.5 kilometre to the Munster plant for drying and storage.

The dried and pre-heated shell sands are mixed with hot gases in a rotary kiln and decarbonised to produce quicklime (calcium oxide).

The quicklime is shipped by road or rail in sealed containers to more than 57 locations around the state.

Related products including kiln dust and hydrated lime (Ca (OH)2), a powder produced by mixing quicklime with water, are also produced for a range of industries as lower grade pH modifiers, including for reducing acidity in agricultural soils.

As well as providing important inputs for Western Australia's construction and minerals processing industries, the Munster operation supports business and employment around the State.

Along with limestone quarried locally, it uses coal and bauxite from the South West, gypsum mined in the Wheatbelt, and natural gas and iron ore from the North West.

Additionally, in co-operation with the Fremantle Port Authority, shell sand extraction has helped in constructing two shipping channels.

Cockburn Cement also operates a second, smaller (100,000 tpa) lime production facility at Dongara near Geraldton, retrieving shell sands



*Cockburn Cement produces about 65 per cent of cement consumed in Western Australia.*

from onshore dunes and has storage, packaging and distribution facilities at Kwinana, Kalgoorlie, Kemerton and Port Hedland.

Last year the company estimated that in addition to more than 300 CCL employees, 113 jobs were directly linked to the company's capital expenditure on plant and equipment and another 570 people were employed by companies supplying inputs and transport services.

With annual wages and salary expenditure of A\$33 million, it estimated its Western Australian operations spent A\$230 million annually in Western Australia.

Mr Strange said the Munster plant's location, with good access to the State's freight rail and road network as well as key resources, and proximity to Fremantle Port are important to its success.

However, the rural properties and uncleared land that once surrounded the plant are increasingly being swallowed by residential development. Residents object to the dust and odours that they attribute to plant operations.

Growing recreational usage and environmental awareness has also triggered concern about sand dredging and washing in Owen Anchorage.

In December 2010, following a review of CCL's environmental protection licence, the State's Department of Environment and Conservation significantly strengthened controls on emissions and set lower discharge targets and limits and increased reporting requirements.

Mr Strange acknowledges that cement and lime production does generate dust, but said the company is improving its environmental performance across all its operations.

"We maintain a good relationship with the Department of Environment and Conservation and have always complied with the emissions standards and other requirements of our licence," he said.

"We will meet the new requirements.

"To reduce our footprint, we have closed our two older, less efficient kilns and undertaken a series of upgrades including installing electrostatic precipitators and operating mobile dust suppression at the site.

"We spend A\$20-\$30 million annually on maintenance of our operations to ensure they are working efficiently.

"Currently, we are installing an A\$24 million bag filter which will capture almost all the dust from the lime kiln."

Mr Strange said the company's environmental expenditure included quarry rehabilitation, and funding for research and the development

of seagrass regeneration. Also, new dredging areas avoid seagrass banks, reefs and other marine features.

"As well as investing in environmental improvements, the company actively engages with local community members and organisations, both to help us identify and deal with specific problems and to build their understanding of our operations," Mr Strange said.

He also points out that the company is not the only potential source of dust and emissions in the local area.

"We sit in the middle of large scale market gardening, which along with residential development activity nearby, generate dust, and the State's major heavy industry area at Kwinana is 10 kilometres away, in the direction from which prevailing winds blow," he said.

In October 2010, the Western Australian Parliament passed amendments to the *Cement Works (Cockburn Cement Limited) Agreement 1971*, which will enable the Munster plant, sand drenching and washing operations, to continue until 2031, and provide access to 60 million tonnes of shell sands in Owen Anchorage.

The Department of State Development, which manages State Agreements on behalf of the Western Australian Government, negotiated the variations with Cockburn Cement. ■

# EARLY LIFE ON EARTH

## PROTECTING WA'S ANCIENT SITES

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Western Australia's unique geology is of global significance and includes the oldest minerals and fossils on the planet, along with meteorite craters, that provide a greater understanding of its evolution.

Until recently, the public has enjoyed unimpeded access to geoscientific sites, except where access is via private roads.

The Department of Mines and Petroleum has recently developed a management plan for eight established State Geoheritage Reserves to protect their global significance.

State Geoheritage Reserves are Crown Reserves that require greater management control than typical 'geoheritage sites' and include features such as rare or unique fossils or geological structures.

Six of these sites provide evidence of early life on earth with visible traces of life at 3.5 billion years ago, as well as earlier meteorite or asteroid impact structures.

Procedures have been introduced to restrict potentially damaging activities within the reserves includes viewing, research work, sampling of rocks or fossils or any other purpose.

Anyone wishing to visit the sites must now seek Government authority from the Executive Director of the Geological Survey of WA (GSWA). Applications to access the sites will be assessed by a panel of experts.

Mineral Titles Executive Director Dr Ivor Roberts said the international importance of particular rock outcrops within the reserves had led to extensive publicity.

"This has led to increasing numbers of visitors from Australia and overseas, resulting in not only serious damage, but also evidence of commercial sampling," Dr Roberts said.

"Such damage, if it continues would seriously compromise or even destroy the exceptional geoheritage value of the rocks within the reserves."

Dr Roberts said that any proposals that involve ground disturbing activities must be accompanied by a detailed research proposal, including background, project aims, methods and an undertaking to provide reports on results to the GSWA Executive Director.

Applications must be submitted at least two months prior to the planned visit and the reports will be treated as confidential for an agreed period of up to three years.

State Geoheritage Reserves are created under section 41 of the *WA Land Administration Act 1997* through a management order that vests them with the Minister for Mines and Petroleum.

"Each of these sites is in danger of losing part of its geoscientific significance and value through inappropriate activities such as large-scale sampling or the cumulative effects of repeated small-scale sampling," Dr Roberts said.

Several geoheritage sites, including Pilbara fossil sites and the Dalgarranga meteorite crater, have been identified as 'Mars analogue sites', garnering additional attention.

"Increasing numbers of people are now visiting the sites and unrestricted access and sampling will lead to progressive deterioration of rock faces and other features," Dr Roberts said.

"This would result in the loss of critical scientific information to the global scientific community, and to the general public.

"A more strategic and sustainable approach to management is now necessary and hence the need for State Geoheritage Reserves, and the protection it will afford these sites."

There is also anecdotal evidence of some tour operators intending to use key sites in their schedules, and public pressure on irreplaceable sites is expected to increase as tourism grows. ■

### The eight sites now registered as State Geoheritage Reserves are:

- The Veevers Meteorite Crater
- Dalgarranga Meteorite Crater
- North Pole stromatolites
- North Pole microfossils
- Chinaman Creek microfossils
- Spinaway Creek stromatolites
- Strelley West stromatolites
- Trendall stromatolite.

Further information:  
[www.dmp.wa.gov.au/geoheritage](http://www.dmp.wa.gov.au/geoheritage)



*A management plan has been developed to protect the global significance of established geoheritage reserves.*



*A field officer highlights some of the damage caused at a geoheritage site.*

# NEW ENVIRONMENTAL CODE FOR INDUSTRY

Western Australia's mining industry is taking a proactive approach to protecting the environment through the recent development of a voluntary mineral exploration code.

The Code of Environmental Practice for Mineral Exploration has been prepared by the Association of Mining and Exploration Companies (AMEC) in collaboration with the Chamber of Minerals and Energy of Western Australia (CME) and provides practical guidance to mineral explorers in meeting their obligations while maintaining a high standard of environmental stewardship.

AMEC Chief Executive Simon Bennison said the new Code was a genuine proactive and collaborative effort that reinforced the minerals exploration industry's desire to maintain strong environmental credentials.

"The Code has been drafted to provide practical and best practice guidance to assist mineral explorers to identify and meet their environmental obligations to maintain a high standard of environmental performance," he said.

"The Code also details the environmental management issues that should be considered before, during and after exploration activities.

"In addition to addressing a wide range of environmental management issues, the Code should foster good relationships between explorers and the many stakeholders who may have a direct interest in the land that is being explored."

The Code's general principles include:

- promoting best environmental practice and performance within the WA minerals exploration sector
- promoting regular and effective 'good neighbour' communication principles, and agreement of dispute resolution protocols
- ensuring all relevant approvals and agreements are secured, prior to the start of on-the-ground exploration

- identifying, addressing and minimising potential adverse impacts at all stages of the exploration process on native vegetation, flora and fauna
- ensuring progressive rehabilitation and revegetation of areas disturbed by exploration activities
- making the Code available to all parties involved in the exploration of a mining tenement.

CME Chief Executive Reg Howard-Smith said mineral exploration was the lifeblood of Western Australia's mining sector and a strong exploration program was vital in delivering future projects and jobs.

"Almost every explorer wants to become a producer or play a role in developing an economic project – their work is crucial in creating the mines of the future," he said.

*"The best exploration programs encourage positive relationships between the explorer, the landowner and the wider community – this Code will promote a better understanding between all parties."*

Exploration can range from geophysical surveys and hand sampling through to drilling and underground exploration. In the past financial year, more than half of the A\$2.2 billion in mineral exploration expenditure in Australia was spent on prospects in Western Australia.

The Code does not replace relevant stringent State and Federal legislation and statutory requirements on tenement conditions or individual environmental management plans and strategies, but is complementary to these requirements and is available to assist industry.



A pocket version of the Code has been developed for use by mining and exploration companies, drilling contractors and others groups that support the industry. An expanded version is available at [www.amec.org.au](http://www.amec.org.au) or [www.cmewa.com](http://www.cmewa.com) ■



State Mining Engineer Simon Ridge (front row, third from left) with the new mine safety staff.

# MINE SAFETY

## NEW RECRUITS

As Western Australia begins a new period of growth in the resources industry, the state is well positioned to tackle mine safety with the recent appointment of a high-calibre of new recruits to the field.

Twenty-two new mines safety staff commenced employment recently with the Department of Mines and Petroleum and have started their six-month formative training tailored to the needs of the inspector role.

The new recruits are specialists in a number of areas including the geotechnical, mechanical, process engineering, occupational safety and health, and mining engineering fields.

Ten staff will be regionally based with seven heading to Kalgoorlie and three to Collie.

Resources Safety Executive Director Malcolm Russell said the appointments were an important milestone in the safety reform process.

*“These additional inspector positions will help drive the significant changes to resource safety regulation currently under way,” Mr Russell said.*

Mr Russell said the appointments were part of the Department’s recruitment drive which aimed to recruit the best possible people for the range of positions available.

“These are technically and intellectually challenging positions and it is vital that we have skilled, passionate people to fill them,” he said.

“This campaign, which is going national and international in some cases, ensures that we are doing all we can to attract the right people.”

Among the recruits, two regional inspectors have been appointed - Trevor Jones is responsible for the East Inspectorate (including the Goldfields) and Andrew Chaplyn for the North Inspectorate (including the Pilbara and the Kimberley).

The arrival of additional inspectors means that the West Inspectorate (including the South West and Mid West) will no longer be required to service the Pilbara.

The Collie office will be boosted by the arrival of three new locally based staff with skills in occupational safety and health, and electrical and mechanical engineering.

“The calibre of applicants has been extremely high,” Mr Russell said.

“These appointments will play an important role in better positioning the regulator for the next period of sustained growth in the resources industry.”

Further recruitment is scheduled for 2011. ■



*The Xstrata Nickel team captain gives orders during the rope rescue scenario.*

# MINE RESCUE MILESTONE BRINGS SAFETY REMINDER

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One hundred years ago, mine safety in Western Australia concentrated on first aid and breathing equipment. A century on and new technology has brought with it additional safety concerns but the focus is still about making sure everyone who enters a mine, safely leaves the mine.

This year will mark the centenary of Western Australia's first Mine Rescue competition, which began in the Goldfields region.

Back in 1911 the competition was very different to the ones we know today—the

first Goldfields competition consisted of only two skill challenges based on first aid and breathing apparatus.

While these two scenarios still feature in the modern incarnation of mine rescue competitions, a number of other skills are also tested for both underground and surface mining, including confined space rescue, vehicle extrication, fire fighting, hazmat, and incident management and theory.

The scenarios and techniques may have changed but the reasons that teams

participate in mine rescue competitions remain much the same - for the bonds of mateship and family, and to do everything possible to ensure that everyone who enters a mine, safely leaves the mine.

In 2010 two separate mining incidents threw a stark light on the importance of mine rescue teams.

The first occurred on August 5, when a rock fall trapped 33 miners more than 600 metres underground in a Chilean copper mine.

The men were trapped for more than two months and were only freed after a global mines rescue effort, which included Australian expertise.

People around the world rejoiced as live pictures broadcast each miner slowly emerging from the specially designed rescue capsule.

Just over a month later, an explosion rocked the Pike River underground coal mine in Greymouth, New Zealand.

Twenty-nine miners, including two Australians, were unaccounted for following the explosion.

Despite the best efforts of rescuers there would be no fairytale ending. A second underground explosion left no hope of survival.

The despair of Greymouth's locals was felt across the international mining community and the community at large.

It was a tragedy that cut to the heart of the mining industry and reinforced the incredibly difficult, but vital role played by mine rescue teams.

After the Chilean and New Zealand incidents, it is hard not to see the importance of mine rescue competitions in a new light. The trophies and awards seem less significant in comparison to the experience and knowledge teams receive by participating in these competitions.

Last year, 31 teams competed in the South West, Goldfields Surface and Goldfields Underground Emergency Response Competitions.

Department of Mines and Petroleum State Mining Engineer Simon Ridge said mine rescue competitions were an important way to gauge the capacity of mine sites to deal with on-site emergencies.

*“These competitions really test the emergency response capacity of mine sites,” Mr Ridge said.*

*“It gives them a good understanding of what their strengths are and the areas where they can improve. This is important in ensuring competence across all areas of mine emergency response.”*

Workers from the sites represented at the competitions demonstrate a commitment to emergency response and are assured of the priority their companies give to having well trained rescue teams.

As recent events have shown, having skilled mine rescue teams should not be seen as a luxury but as a necessity. ■



*The ropes are prepared during a rope rescue scenario.*



*One of the teams battles a blaze in a fire fighting scenario.*



*A casualty receives treatment during a first aid scenario.*



*A team checks their breathing apparatus in readiness for a team skills scenario.*

## AGRICULTURE

### East Kimberley - Ord - East Kimberley Expansion Project

WA STATE GOVERNMENT

The State Government has committed \$220 million to increase the existing amount of irrigated land in the Kununurra region by adding 8,000 hectares at Weaber Plains. This funding will provide the construction of irrigation channels, roads and off-farm infrastructure to service the future needs of the region's growing population and sustain economic growth. The Commonwealth Government has committed \$195 million of funding for social and common use infrastructure in the East Kimberley region. Construction has commenced and the package will be fully implemented by June 2013. Expenditure: \$415m.

Employment: Construction: 483

## IRON ORE

### Pilbara - FMG Chichester - Iron Ore Mine, Rail and Port Development

FORTESCUE METALS GROUP LTD

FMG Chichester operates iron ore mines at Cloudbreak and Christmas Creek in the Chichester Ranges of the eastern Pilbara, serviced by a multi-user railway and port facilities at Port Hedland. FMG Chichester is currently ramping production up to 45Mtpa and is investigating increasing its production to 95Mtpa from the Chichester Ranges.

Employment: Construction: 2500; Operation: 3200

### Pilbara - Port Hedland - Atlas Iron Turner River Hub

ATLAS IRON LTD

Atlas Iron Ltd is an Iron Ore explorer and miner focused on a growing number of projects in Western Australia. Exports commenced in December 2008 from its Pardoo Project, east of Port Hedland, growing to 6Mtpa with production from the Wodgina Direct Shipping Ore Project, south of Hedland. All exports of Iron Ore are from the Utah Point multi user berth in Port Hedland with ore taken to the port via concessional loaded truck transport. The company is targeting 12Mtpa by 2012 with the proposed Turner River Hub crushing and screening plant, which will act as a centralised processing facility for a number of satellite orebodies. Atlas has recently announced a proposed merger with Giralda Resources NL, which will significantly increase the company's resource base.

Expenditure: \$28m.

Employment: Construction: 132; Operation: 143

## LITHIUM

### Great Southern Region - Mount Cattlin Lithium Project, Ravensthorpe

GALAXY RESOURCES LIMITED

Galaxy Resources Limited commenced commissioning of the Mt Cattlin lithium concentrate processing plant in September 2010. The mine and the processing plant will produce approx. 137,000tpa of spodumene concentrate. Galaxy will start exporting its product through the Esperance Port to China in the first quarter of 2011. In China, Galaxy will produce 17,000tpa of battery grade lithium carbonate. A large proportion of this will make its way into the growing markets of Japan, Korea and Europe.

Expenditure: \$75m.

Employment: Construction: 100; Operation: 75

## BAUXITE

### Worsley/Boddington - Alumina Refinery - E & G Project Expansion to 4.7Mtpa

BHP Billiton announced in May 2008 the go-ahead for the A\$2.5 billion Efficiency and Growth (E&G) expansion project at its Worsley alumina refinery. The expansion project will lift capacity of the refinery from 3.5Mtpa to 4.7Mtpa through expanded mining operations, additional refining capacity and upgraded port facilities. Construction has commenced and production capacity is expected to be expanded by 2012. An additional A\$500 million will be spent on a new multi-fuel cogeneration power plant to be built at the refinery.

Expenditure: \$2.5b.

Employment: Construction: 1500; Operation: 200

## HEAVY MINERAL SANDS

### Tutunup South - Heavy Mineral Sands Mine

ILUKA RESOURCES LIMITED

The Tutunup South mineral sands mine, located approximately 15km south east of Busselton, is currently under construction and first production is planned to commence in the second half of 2011. The project involves the construction of mine pits, screen plant, ore concentrator, solar drying dams and associated mine infrastructure. The mine is expected to produce over 1.2Mt of heavy mineral concentrate over its four to five year life, which will be transported to Capel for further processing. The small stream of non-magnetic material (zircon and titanium dioxide products) will be processed at Narngulu, near Geraldton.

Expenditure: \$30m.

Employment: Construction: 130; Operation: 30

## IRON ORE

### Mid West Region - Extension Hill Hematite Mine

MOUNT GIBSON IRON LIMITED

Mount Gibson Iron has environmental approval for a 3Mtpa hematite mining operation at Extension Hill, 260km south east of Geraldton. The ore will be trucked to a rail head near Perenjori then railed to the port of Geraldton for export. Construction of the project has commenced with first shipments expected to be in June 2011.

Expenditure: \$73m.

Employment: Construction: 150; Operation: 100

### Mid West Region - Karara Iron Ore

KARARA MINING LTD (GINDALBIE METALS LTD / ANSTEEL JOINT VENTURE)

The Karara Iron Ore Project is Karara Mining's cornerstone production project in the Mid West region. Construction commenced in November 2009. Karara will deliver some 10Mtpa of iron products before the end of 2011, comprising 8Mtpa of high grade magnetite concentrate and blast furnace quality pellets and 2Mtpa of Direct Shipping Ore hematite. The Project is underpinned by a world-class JORC-Code compliant resource base comprising a 522 million tonne magnetite reserve, a 1.85 billion tonne magnetite resource, a 10.9Mt hematite reserve and a 16.2Mt hematite resource.

Expenditure: \$1.975b.

Employment: Construction: 1500; Operation: 500

### Pilbara - BHPB Rapid Growth Project 5

BHP BILLITON IRON ORE PTY LTD

BHP Billiton Iron Ore has obtained all relevant Government approvals to further increase its installed production capacity of its Western Australian Iron Ore operations. The project includes mine expansions, dual tracking of sections of the railways and additional berths at Port Hedland inner

harbour, for which engineering is 99% complete, construction is 89% complete. The overall project is 90% complete, based on original scope. The scope of the iron ore development sequence continues to be reviewed.

Expenditure: \$4.8b.

Employment: Construction: 3500

### Solomon - Pilbara - Solomon Hub Stage 1

FORTESCUE METALS GROUP LTD

Fortescue is progressing with approvals for its proposed 60 million tonne per annum iron ore mine at Solomon and supporting infrastructure. The Solomon Hub is planned to initially involve at least two mining areas, two processing plants and a 130 kilometre rail link to Fortescue's existing Christmas Creek to Port Hedland rail line. The proposed mining areas and rail corridor for the Solomon Hub are within Unallocated Crown Land and active pastoral leases and approximately 70 kilometres north of Tom Price in the Hamersley Ranges. Subject to Government approvals and final sign off by the Fortescue Board, a two year construction period will begin in 2011 with first production planned for mid 2012.

Expenditure: \$4b.

Employment: Construction: 1000; Operation: 1000

### Yilgarn - Koolyanobbing Iron Ore Upgrade

CLIFFS ASIA PACIFIC IRON ORE PTY LTD

In September 2010, Cliffs approved an upgrade of its Koolyanobbing iron ore operations from 8.5Mtpa to around 11Mtpa. Koolyanobbing is located 50km north east of Southern Cross and also includes the Mt Jackson and Windarling mines. The improvements are expected to consist of enhancements to the existing Kalgoorlie-Esperance rail infrastructure, an increase in rolling stock and upgrades to various other existing operational constraints. Cliffs anticipates these improvements to be fully implemented in the second half of 2012. The development of the Mt Jackson J1 deposit, which contains 30Mt of iron ore reserves, is currently underway and is expected to contribute to the increased production.

Expenditure: \$320m.

## IRON ORE PROCESSING

### Pilbara - Cape Preston - Sino Iron

CITIC PACIFIC

CITIC Pacific Mining is constructing the Sino Iron project at Cape Preston, 100 kilometres south west of Karratha. The magnetite iron ore project will include a concentrator, 6Mtpa pellet plant, 25km slurry pipeline, combined cycle 450MW power station, new port and trans-shipment facilities, and a 51GL desalination plant. At full production up to 27.6 million tonnes of magnetite concentrate and high grade pellets will be exported each year. First shipment of concentrate is expected in the second half of 2011.

Expenditure: \$5.2b.

Employment: Construction: 4000; Operation: 500

## NICKEL

### Ravensthorpe - Ravensthorpe Nickel Operation

FIRST QUANTUM MINERALS AUSTRALIA NICKEL PTY LTD

First Quantum Minerals (FQM) acquired the Ravensthorpe Nickel Operation (RNO) from BHP Billiton in February 2010. FQM plans to return RNO to sustainable production by late 2011. RNO is an open cut mine and hydrometallurgical process plant that produces a mixed nickel cobalt hydroxide intermediate product. The modifications are within the plant's existing footprint in the materials

## Committed Projects

handling area, including crushing, conveying and stockpiles. FQM aims to produce 39,000tpa nickel metal for the first five years after recommencement and 28,000tpa nickel metal over the current anticipated mine life of 32 years.

Expenditure: \$190m.

Employment: Construction: 200; Operation: 500

### OIL & GAS DEVELOPMENTS

#### Carnarvon Basin - Pluto LNG WOODSIDE ENERGY

Approved for development in July 2007, the Pluto LNG Project will process gas from the Pluto and Xena gas fields, located in the Carnarvon Basin about 190km north-west of Karratha, Western Australia. The Pluto and Xena gas fields are estimated to contain 4.6 trillion cubic feet (Tcf) of dry gas reserves and an additional 0.5Tcf of contingent resources. The initial phase of the project comprises an offshore platform, connected to five subsea wells on the Pluto gas field. Gas will be piped in a 180km trunk line to the Pluto LNG Park onshore facility located on the Burrup Peninsula. Onshore infrastructure comprises a single LNG processing train with a forecast production capacity of 4.3 million tonnes a year. Storage and loading facilities include LNG and condensate storage tanks and export jetty. The Pluto LNG Project is on track to become the world's fastest developed LNG project from discovery of the gas field in 2005 to first LNG in 2011.

Expenditure: \$14b.

Employment: Construction: 4000; Operation: 300

#### Carnarvon Offshore Basin - Barrow Island - Gorgon Project GORGON JOINT VENTURE

The Gorgon Joint Venture (GJV) made a final investment decision on the \$43 billion Gorgon Project on 14 September 2009. The GJV's foundation project on Barrow Island includes a three train LNG development capable of exporting 15Mtpa and a domestic gas project capable of delivering at least 300 terajoules per day of gas to the mainland. The development on Barrow Island also includes potentially the largest commercial geosequestration project in the world. The project obtained State and Commonwealth environmental approval in August 2009. The project is based on gas from both the offshore Gorgon and Jansz/lo gas fields. On-island activity commenced in late 2009 and construction of the processing plant is scheduled to commence in 2011.

Expenditure: \$43b.

Employment: Construction: 3500; Operation: 300

#### Carnarvon Offshore Basin - Cossack/Wanaea - Cossack/Wanaea Redevelopment WOODSIDE ENERGY

In December 2008 the Cossack Wanaea Lambert and Hermes oil venture participants (CWLH joint venture) approved funding of the A\$1.8 billion CWLH Redevelopment Project to support ongoing safe and reliable production from the Cossack, Wanaea, Lambert and Hermes fields beyond 2020. The project scope of work includes the purchase and conversion of the Okha floating storage and offloading (FSO) facility owned by Single Buoy Moorings into an FPSO facility to replace the Cossack Pioneer FPSO in 2011, and the replacement of associated subsea infrastructure.

Expenditure: \$1.8b.

#### Carnarvon Offshore Basin - North Rankin - North Rankin Redevelopment WOODSIDE ENERGY

In March 2008 the North West Shelf Venture participants approved funding of the \$5 billion North Rankin Redevelopment Project which will recover remaining low pressure gas from the North Rankin and Perseus gas fields, and extend the field life to around 2040. The project involves the installation of a new second platform - North Rankin B - with gas compression facilities, low pressure separators, utilities and accommodation. North Rankin B will be connected by a 100m bridge to the existing North Rankin A platform and on completion both platforms will be operated as a single integrated facility known as the North Rankin hub. The North Rankin Redevelopment project also includes the necessary connections to North Rankin A and some refurbishment of the North Rankin A platform. North Rankin B is scheduled for start-up in 2013 and will support the North West Shelf Venture's onshore gas requirements to supply future customer commitments.

Expenditure: \$5b.

#### Pilbara - Devil Creek Development Project APACHE ENERGY LIMITED

Apache Northwest and Santos Offshore are continuing construction works for the Devil Creek Development Project, a greenfield gas project comprised of an unmanned offshore gas production platform over the Reindeer gas field located about 80km northwest of Dampier; offshore and onshore gas pipelines; an onshore gas processing plant and a sales gas export pipeline connected to the Dampier to Bunbury Natural Gas Pipeline. The development site is located near Devil Creek, 65km south west of Karratha where the construction workforce is being accommodated within a purpose built facility. The project is designed to provide up to 200 terajoules per day of dry natural gas and between 80kl to 160kl per day of gas condensate. All gas will service the domestic market in Western Australia. Gas plant site civil works are now complete, thus facilitating the installation of pipe rack and gas processing modules. Module pipework and electrical interconnection work is now proceeding. Construction of the onshore gas supply pipeline and the pipeline shore crossing is now complete and the offshore installation works has commenced, with first gas to be delivered second half 2011.

Expenditure: \$800m.

Employment: Construction: 200; Operation: 20

### RARE EARTHS

#### Mt Weld - Rare Earths Mine LYNAS CORPORATION LTD

The Mt Weld deposit is located about 35km south of Laverton and contains an estimated resource of 17.4Mt at 8.1% grade for 1.41Mt rare earth oxides (REO). The mine development includes an open pit mine and concentration plant at Mt Weld, which is scheduled to be commissioned in Q1 2011. The concentrate will be bagged and containerised on site, and trucked to the Port of Fremantle for export. The ore will be shipped to a \$300 million processing plant in Malaysia, which will have an initial production capacity of 11,000tpa REO scheduled to commence in Q3 2011, expanding to 22,000tpa by 2013.

Expenditure: \$135m.

Employment: Construction: 135; Operation: 90

### SILICON METAL

#### Kemerton - Silicon Metal Plant Expansion SIMCOA OPERATIONS PTY LTD

Simcoa announced in October 2009 its decision to expand the company's 32,000tpa capacity silicon metal plant at Kemerton. The first stage expansion, involving installation of a third furnace, will increase the plant capacity to 48,000tpa and commissioning is scheduled for Q3 2011. Providing world demand for silicon continues to increase strongly, a second stage expansion, involving installation of a fourth furnace could take place by late 2013 and increase plant capacity to 64,000tpa.

Expenditure: \$100m.

Employment: Construction: 120; Operation: 40

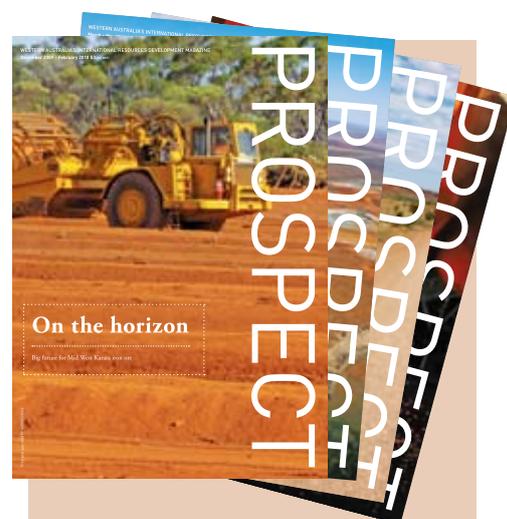
### VANADIUM

#### Windimurra - Windimurra Vanadium Project ATLANTIC LIMITED

Atlantic Limited acquired Windimurra Vanadium Project in September 2010 following the execution and completion of agreements with Mineral Resources Limited and Midwest Vanadium Pty Ltd. Atlantic expects to complete construction and commence operations in Q3 2011 and reach full capacity in Q1 2013. Once the project is complete, it is expected to produce approx. 5,700 tonnes of contained vanadium per year. The company will export containerised ferrovandium to overseas customers through the Port of Fremantle.

Expenditure: \$500m.

Employment: Construction: 350; Operation: 120



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## AMMONIA/UREA

### Shotts Industrial Park - Collie Coal to Urea PERDAMAN CHEMICALS AND FERTILISERS PTY LTD

Perdaman Chemical and Fertilisers Pty Ltd is developing a \$3.5 billion coal to urea plant at the new (to be developed) Shotts Industrial Park, near Collie. The plant will use proven "best in class" coal gasification and fertiliser production technologies. Around 2.7Mtpa of coal will be used to produce approximately 2Mtpa of urea, primarily for export. The urea will be transported to Bunbury Port by rail. The company has recently received environmental approval from the WA Minister for Environment in accordance with the Environmental Protection Act. A 20-year off take agreement has been signed with Incitec Pivot. Construction is expected to commence in 2011 with the first shipment of urea planned for 2014.

Expenditure: \$3.5b.

Employment: Construction: 1500; Operation: 200

## AMMONIUM NITRATE

### Pilbara - Burrup Industrial Estate Site D - Burrup Nitrates BURRUP NITRATES PTY LTD

Burrup Nitrates Pty Ltd (BNPL), a joint venture between Burrup Holdings Ltd (BHL) of Australia and Yara International ASA of Norway, is conducting a feasibility study into the construction of a 350,000tpa Technical Ammonium Nitrate (TAN) plant to be located on the Burrup Peninsula. Ammonia feedstock will be supplied from BHL's subsidiary company Burrup Fertilisers Pty Ltd, which operates its facility directly adjacent to the proposed location for the new TAN plant. It is expected that all manufactured product will be sold into the Pilbara region. Regulatory approvals are in progress. The company is aiming for operations to commence by Q4 2013.

Expenditure: \$600m.

Employment: Construction: 600; Operation: 65

## ELECTRICITY

### Collie - Bluewaters III and IV, Coal Fired Power Stations GRIFFIN ENERGY PTY LTD

Griffin Energy is planning to expand the Bluewaters Power Station Project with two additional 208MW coal-fired power stations at the Coolangatta Industrial Estate, near Collie. Commissioning of the Bluewaters III base-load power station is expected by late 2013 and commissioning of Bluewaters IV by late 2015 subject to all statutory and other approvals.

Expenditure: \$800m.

Employment: Construction: 600; Operation: 50

### Mid West Region - Centauri 1 Power ENEABBA GAS LIMITED (EGL)

Eneabba Gas Limited is planning to develop a 168MW Centauri 1 gas-fired turbine power station near Dongara. Generation capacity can be increased to 365MW. The project is focused on supplying additional volumes of energy for the developing Mid West iron ore industries. Besides sourcing gas from the Dampier to Bunbury Natural Gas Pipeline, the company is working to develop an underground coal gasification gas supply for the facility.

Expenditure: \$200m.

Employment: Construction: 100; Operation: 4

## GOLD

### Kalgoorlie (330kms North East) - Tropicana Gold ANGLOGOLD ASHANTI/INDEPENDENCE GROUP JOINT VENTURE

AngloGold Ashanti, as Joint Venture Manager, has undertaken an intensive exploration and resource development program approximately 330kms north east of Kalgoorlie. Plans for the project are to develop an open-cut gold mine and nearby processing plant. So far, a resource estimate of 5 million oz of gold has been identified with a mine life of at least 10 years. The feasibility study commenced in July 2009 and is ongoing. Environmental approvals were finalised in September 2010. Commonwealth environmental approval received on 13 December 2010. Gold production is planned for 2013.

Expenditure: \$700m.

Employment: Construction: 700; Operation: 400

## HEAVY MINERAL SANDS

### Happy Valley - Heavy Mineral Sands Mine BEMAX CABLE SANDS (WA) PTY LTD

Located adjacent to the Bemax Gwindinup deposits south of Bunbury, the project will involve the mining of the Happy Valley North and South mineral sands deposits situated on private land and in State Forest. The two deposits contain over 750,000 tonnes of recoverable heavy mineral concentrate, with average production expected to be around 150,000tpa over a combined mine life of eight years. The project is currently progressing through the environmental assessment process. Subject to obtaining all relevant approvals, mining of the North deposit could commence in Q1 2012 and then mining of the South deposit commencing two years later. The concentrate will be trucked to Bemax's Bunbury Mineral Separation Plant for final processing.

Expenditure: \$35m.

Employment: Construction: 100; Operation: 30

### Keysbrook - Heavy Mineral Sands Mine MATILDA ZIRCON LIMITED

Matilda Zircon proposes to develop a mineral sands mine located near the township of Keysbrook, approximately 70km south of Perth. It has ore reserves of 41Mt, containing 1.2Mt of heavy mineral concentrate. The project is expected to produce 40,000tpa of leucoxene and 47,000tpa of ilmenite, high titanium ilmenite and zircon over its eight year mine life. Keysbrook received environmental approval in October 2009. Matilda's applications for development approvals have been refused by the Murray and Serpentine-Jarrahdale Shires, and have been referred to the State Administrative Tribunal. A determination from this process is expected in Q1 2011. Subject to obtaining development approvals and completion of the Definitive Feasibility Study, Matilda Zircon will be in a position to seek funding and start construction in the second half of 2011.

Expenditure: \$18m.

Employment: Construction: 35; Operation: 30

### Shark Bay - Coburn Zircon Project GUNSON RESOURCES LIMITED

Gunson proposes to develop the Coburn mineral sands project, located south of Shark Bay. It contains total ore reserves of 308Mt at an average grade of 1.2% heavy minerals, all of which lie within the portion of the project area that has received government environmental approvals for mining. At the proposed mining rate of 17.5Mtpa, the Coburn mine life is estimated to be 17.5 years which could be extended by six years if the northern area receives government approvals for mining. The Definitive Feasibility Study was completed in December 2009 and Gunson is continuing to advance discussions with potential strategic funding and offtake partners.

Expenditure: \$169m.

Employment: Construction: 170; Operation: 110

## INFRASTRUCTURE

### Kimberley - James Price Point - Browse LNG Precinct WA STATE GOVERNMENT

The State Government is developing a Liquefied Natural Gas (LNG) Precinct near James Price Point, 60km north of Broome, to enable processing of natural gas from the offshore Browse Basin. The LNG Precinct will be capable of accommodating LNG processing and shipping facilities for at least two proponents currently exploring for and developing these resources. This approach will minimise the environmental footprint of gas processing in the region while maximising opportunities for local people and businesses to participate in, and benefit from, employment and business opportunities. Woodside's final investment decision for the precinct is expected to be made in mid-2012.

Expenditure: \$30b.

Employment: Construction: 6000; Operation: 400

### Oakajee - Oakajee Midwest Development WA STATE GOVERNMENT

The Oakajee Port will include common user infrastructure (channel, breakwater, turning basin, navigational aids, provision for tug and pilot boat pens, port administration offices and roads and utilities) funded by the State and Commonwealth Governments and private use infrastructure (at least one Cape Class iron ore berth, as well as associated materials handling equipment and rail infrastructure) funded by Oakajee Port and Rail Pty Ltd. The Port will also include provision for a non iron ore berth in the future to provide import / export capability for value-adding industries in the Oakajee Industrial Estate. A northern railway will link the port to mining tenements north-east of Geraldton and a southern railway will link the mining tenements to the south-east. The northern rail line will be operated by Oakajee Port and Rail though an open access regime. Oakajee Port and Rail has now identified three foundation customers with an expected initial throughput of 45Mtpa and delivered its draft bankable feasibility study to the State for consideration.

Expenditure: \$4b.

Employment: Construction: 2000; Operation: 300

### Pilbara - Anketell - Anketell Port and SIA (Strategic Industrial Area) WA STATE GOVERNMENT

The Anketell project includes establishment of a multi-user, multi-commodity deepwater port and associated strategic industrial area (SIA) at Anketell, located 30km east of Karratha. The port and corridor development will be proponent funded but will ultimately be managed and owned by the Dampier Port Authority. The strategic industry land will be managed by LandCorp. Three Companies have expressed interest in developing facilities at Anketell: Australia Premium Iron (API) for its 30-40Mtpa West Pilbara Iron project, MCC Australia Holding Pty Ltd (MCC) for its 15Mtpa Cape Lambert Iron Ore project, and Fortescue Metals Group (FMG) for its 100Mtpa Solomon project. It is planned that the port construction period commence in early 2012 to enable operations to commence 2014.

## IRON ORE

### Great Southern Region - Southdown Magnetite Mine GRANGE RESOURCES LTD

The Southdown Magnetite deposit is situated 90km north east of Albany near Wellstead. The Southdown Project is a joint venture between Grange Resources Ltd (70%) and Sojitz Resources & Technology Pty Ltd. Grange Resources Ltd is targeting a 2014 start up with production of 10Mtpa of magnetite concentrate.

## Projects Under Consideration

The slurry concentrate will be transported via a 100km underground pipeline from the mine to the Port of Albany for export and pelletising. The Albany Port Authority received environmental Ministerial approval in November 2010 to expand the Port to allow access by Cape size vessels and to increase berth, storage and loading facilities. Environmental approvals for a 6.6Mtpa mine and pipeline are in place and an increase for the mine to produce 10Mtpa is currently being processed. Assuming the current prefeasibility study has positive results, a definitive feasibility study is expected by late 2011.

Expenditure: \$1.7b.

Employment: Construction: 2000; Operation: 600

### **Mid West Region - Extension Hill Magnetite Mine** ASIA IRON

Asia Iron has primary environmental approval to produce up to 10Mtpa of magnetite concentrate, which will be transported by slurry pipeline to the port of Geraldton for export. The company is currently seeking secondary approvals.

Expenditure: \$2b.

Employment: Construction: 1000; Operation: 350

### **Mid West Region - Jack Hills Expansion** CROSSLANDS RESOURCES

Crosslands commenced trucking 1.5Mtpa hematite from its Jack Hills operations to the port of Geraldton in December 2006. Jack Hills Stage 2 would involve an increase to 25-35Mtpa of hematite and beneficiation feed ore. The ore would be transported by a new railway to a new deepwater port at Oakajee. A bankable feasibility study and exploration drilling program on the Stage 2 project is progressing.

Expenditure: \$2b.

Employment: Construction: 450; Operation: 350

### **Mid West Region - Weld Range Iron Ore Mine** SINOSTEEL MIDWEST CORPORATION LIMITED

Sinosteel Midwest Corporation proposes to develop a 15Mtpa iron ore mine at Weld Range 65km southwest of Meekatharra, producing a mix of hematite lump and fines. The project is expected to utilise a new rail line and a new deepwater port facility at Oakajee. The company finalised a bankable feasibility study in July 2010.

Expenditure: \$1b.

Employment: Construction: 1000; Operation: 500

### **Pilbara - BHPB Rapid Growth Project 6** BHP BILLITON IRON ORE PTY LTD

In November 2010, a further US\$570 million (BHP Billiton share) of capital expenditure was approved to underpin continued growth in BHP Billiton's Western Australian Iron Ore production profile. The investment expands on BHP Billiton's earlier pre-commitment of US\$1.73 billion (BHP Billiton share) announced in January 2010 and will facilitate the ongoing development of port, rail and Jimblebar mine infrastructure.

### **Pilbara - Cape Lambert Iron Ore Project**

MCC Australia Holding Pty Ltd (MCCAH) is developing a 15Mtpa magnetite iron ore mine in the Pilbara and aims to ship its first ore in 2015. The Project comprises a proven JORC compliant 1.9bt iron ore resource. The Project will comprise a beneficiation plant, 300MW power plant, port facilities for exporting concentrate and other related infrastructure. MCC has completed feasibility studies for the port, power supply, water supply, accommodation and general site infrastructure. The mine and processing studies are progressing. The company commenced native title negotiations with the Ngarluma Aboriginal people in March 2010. A draft environmental scoping document has been submitted to the EPA.

Expenditure: \$3.7b.

Employment: Construction: 3000; Operation: 1000

### **Pilbara - FMG Central Pilbara Project (Solomon Stage 2 and Western Hub)**

FORTESCUE METALS GROUP LTD

FMG's Central Pilbara project is located in the Solomon Stage 2 area (about 70km north of Tom Price) and the Western Hub (west Solomon) in the Pilbara. To date, Solomon Stage 2 has identified resources of 1.1 billion tonnes, with a target of 2 billion tonnes, comprising channel iron, bedded Brockman and detritals iron deposits. Start-up production from Solomon Stage 2 of 20Mtpa is scheduled for 2014, with aspirations to expand to around 200Mtpa by 2017 (100Mtpa from Solomon Stage 2 and 100Mtpa from Western Hub). The project comprises mines, a new 250km railway linking Solomon Stage 2 mines to berths and shiploading facilities in the 350Mtpa multi-user Anketell port. Capital expenditure is estimated at \$7billion.

Transportation of ore from the future Western Hub mines can either be on FMG's central rail or on the API rail. Western Hub mines are 250-300km via API's rail and 280-320km via FMG's central rail.

Expenditure: \$7b.

Employment: Construction: 4800; Operation: 2650

### **Pilbara - Roy Hill Iron Ore Mine & Infrastructure** HANCOCK PROSPECTING PTY LTD

Hancock Prospecting is developing the Roy Hill iron ore project located 105km north east of Newman. This project is expected to come into production in 2014 and will produce iron ore for over 20 years after ramp up at 55Mtpa. The project includes the development of the mine, a new railway and port facilities at Port Hedland. Environmental approval for Roy Hill mine Stage 1 was received in December 2009 and environmental approval for Stage 2 was received in March 2010. The Railway (Roy Hill Infrastructure Pty Ltd) Agreement Bill 2010 was passed by both houses of Parliament in October 2010.

Expenditure: \$7b.

Employment: Construction: 1500; Operation: 750

### **Pilbara - West Pilbara Iron Ore Project** API MANAGEMENT PTY LTD

The Australian Premium Iron Joint Venture is proposing to develop the West Pilbara Iron Ore Project. Stage 1 of the project is based on the production of 30Mtpa of direct shipping iron ore from its Red Hill and Mt Stuart mine sites located 35-80km south west of Pannawonica. The ore will be exported via a new heavy haul railway to a new multi-user port facility at Anketell. Subject to the successful completion of feasibility and environmental studies, and receipt of government regulatory approvals, the company anticipates that the first shipment of ore will occur in 2014.

Expenditure: \$4b.

Employment: Construction: 2000; Operation: 700

## OIL & GAS DEVELOPMENTS

### **Carnarvon Basin - Pluto LNG Project Expansion - Trains 2 & 3** WOODSIDE ENERGY

Woodside's master planning studies have confirmed that the Pluto LNG Park can accommodate an expansion of up to five LNG trains. This gives Woodside the opportunity to consider both equity gas development and other resource owner (ORO) gas supply at the Pluto LNG Park. Onshore Front End Engineering Design (FEED) studies for Pluto Train 2 and Train 3 are now complete and contractor selection processes are underway.

### **Carnarvon Offshore Basin - Macedon Domestic Gas Project**

BHP BILLITON PETROLEUM (AUSTRALIA) PTY LIMITED

The Macedon gas field, about 90km west of Onslow, was discovered in 1992 during drilling of the West Muiron-3 well and is estimated to contain a gas resource of up to 600bcf. BHP Billiton Petroleum

(Australia) Pty Ltd and Apache Energy Limited are currently progressing the necessary approvals for a domestic gas project for Western Australia. The development will involve a number of sub-sea gas wells connected to the gas field, offshore and onshore wet gas pipelines, an onshore gas processing plant 15km southwest of Onslow, and a sales gas pipeline connected to the Dampier-to-Bunbury Natural Gas Pipeline. Daily production is expected to be in the order of 200TJ. Construction is expected to start in early 2011, and gas production to commence in early 2013.

Expenditure: \$1b.

Employment: Construction: 300

### **Pilbara - Wheatstone LNG Development** CHEVRON AUSTRALIA PTY LTD

Chevron is investigating the feasibility of an LNG project based on its Wheatstone and Iago gas fields, to be located at Ashburton North, near Onslow. The project will also process gas from sub-economic third party fields in the Carnarvon Basin. Chevron entered FEED (Front End Engineering Design) in July 2009 with a Final Investment Decision planned for mid 2011. Gas to market is scheduled for 2015/16. The project will initially have two LNG trains with a 10Mtpa capacity, expandable to five, and a 250 million cubic feet per day domestic gas plant.

Expenditure: \$23b.

Employment: Construction: 5000; Operation: 400

## TIMBER

### **Mirambeena Timber Processing Precinct - Engineered Strand Lumber** LIGNOR LTD

Lignor is proposing to develop an Engineered Strand Lumber ESLÂ®/ Engineered Strand Board ESBÂ® plant to be located at Mirambeena, about 15km north west from Albany. Further tests in early 2011 are scheduled to improve the product and production. The proposed plant will produce a range of products for certification to the Australian Building Code and overseas equivalents. The commercial plant will source most of the timber from the extensive eucalypt plantations growing in the Albany region. Following successful results from testing in 2011, the commencement of construction of the commercial plant would be in the first quarter of 2013, with first product going to market middle of 2014.

Expenditure: \$276m.

Employment: Construction: 350; Operation: 125

## URANIUM

### **Northern Goldfields - Yeelirrie - Yeelirrie Uranium** BHP BILLITON YEELIRRIE DEVELOPMENT COMPANY PTY LTD

BHP Billiton proposes to develop the Yeelirrie Uranium Project in the North-eastern Goldfields, near Wiluna. The proposal entails open cut mining of shallow deposits of uranium ore, treatment in a plant to be established at the site, and development of associated infrastructure. The project would produce up to 5,000tpa uranium oxide concentrate over about 30 years. The formal environmental impact assessment process was initiated in 2009 and the project Environmental Scoping Document was approved in May 2010. The Company plans to submit its draft ERMP in the first half of 2011 and to achieve all government approvals by end 2012. Construction is expected to commence in early 2013 and mining in 2014. The uranium oxide will be transported to South Australia by road for export to overseas markets.

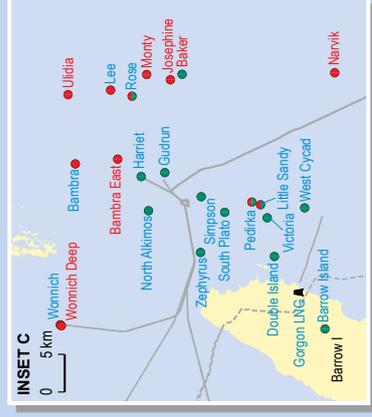
Employment: Construction: 700; Operation: 300



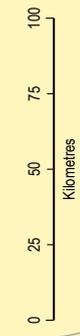
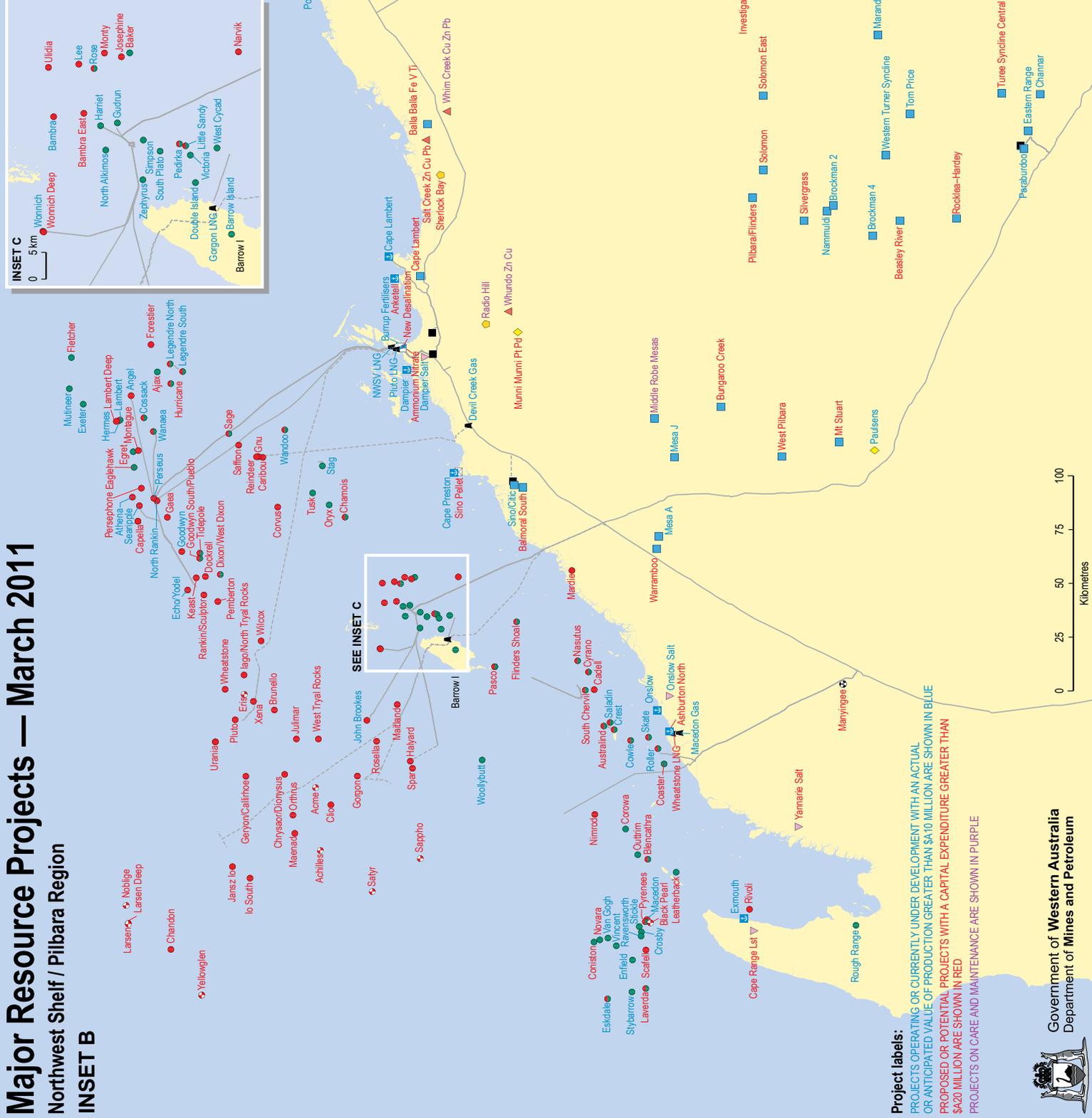
# Major Resource Projects — March 2011

## Northwest Shelf / Pilbara Region

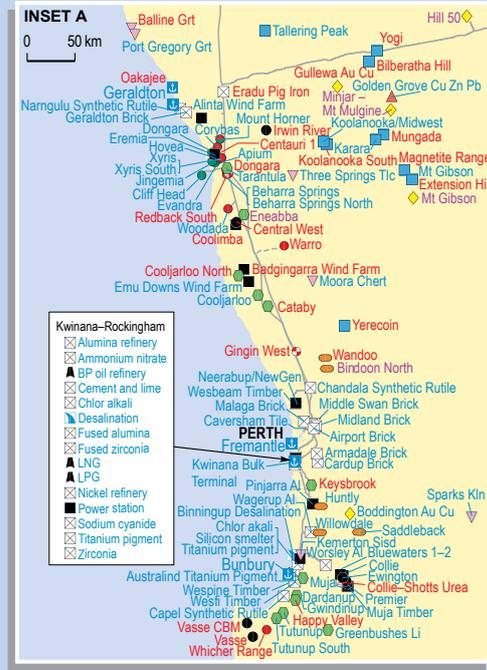
### INSET B



- MINERAL SYMBOLS**
- ◆ Precious metal
  - ◆ Precious metal (or as shown)
  - ◆ Steel alloy metal
  - ◆ Ni (or as shown)
  - ◆ Specialty metal
  - ◆ Ti-Zr (or as shown)
  - ◆ Base metal
  - ◆ Iron
  - ◆ Uranium
  - ◆ Industrial mineral
- PETROLEUM SYMBOLS**
- Gas field
  - Oil field
  - Oil and gas field
  - Significant gas discovery
  - ▲ Processing plant
  - Oil / gas pipeline
  - Oil / gas pipeline, proposed
- INFRASTRUCTURE**
- Power plant
  - Processing plant
  - Irrigation / water / desalination
  - Port
- COMMODITIES**
- Au..... Gold
  - Cu..... Copper
  - Fe..... Iron
  - LNG..... Liquefied natural gas
  - Lst..... Limestone
  - Mn..... Manganese
  - Mo..... Molybdenum
  - Ni..... Nickel
  - Pb..... Lead
  - Pd..... Palladium
  - Pl..... Platinum
  - Ta..... Tantalum
  - Ti..... Titanium
  - V..... Vanadium
  - Zn..... Zinc
  - Zr..... Zirconium



# Major Resource Projects — March 2011



- MINERAL SYMBOLS**
- ☆ Precious mineral
  - Dmd
  - ◆ Precious metal
  - Au (or as shown)
  - Steel alloy metal
  - Ni (or as shown)
  - Speciality metal
  - Ti-Zr (or as shown)
  - ▲ Base metal
  - Iron
  - Alumina
  - Bx (or as shown)
  - Coal and lignite
  - Uranium
  - ▽ Industrial mineral
  - ⊕ Construction material
  - ⊗ Processing plant
- PETROLEUM SYMBOLS**
- Gas field
  - Oil field
  - Oil and gas field
  - Significant gas discovery
  - ▲ Processing plant
  - Oil / gas pipeline
  - - - Oil / gas pipeline, proposed
- INFRASTRUCTURE**
- Power plant
  - ⊕ Radio astronomy
  - ▬ Irrigation / water / desalination
  - ⊕ Port
- COMMODITIES**
- Ag..... Silver
  - Al..... Alumina
  - Au..... Gold
  - Bx..... Bauxite
  - CBM..... Coal Bed Methane
  - Co..... Cobalt
  - Cr..... Chromium
  - Cu..... Copper
  - Dmd..... Diamond
  - Fe..... Iron
  - Fl..... Fluorite
  - Gp..... Gypsum
  - Grt..... Garnet
  - K..... Potassium
  - Kln..... Kaolin
  - Li..... Lithium
  - LNG..... Liquefied natural gas
  - LPG..... Liquefied petroleum gas
  - Lst..... Limestone
  - MgCO<sub>3</sub>..... Magnesite
  - Mn..... Manganese
  - Ni..... Nickel
  - Pb..... Lead
  - Pd..... Palladium
  - Phos..... Phosphate
  - Pl..... Platinum
  - REE..... Rare earth elements
  - Ssd..... Silica sand
  - Ta..... Tantalum
  - Ti..... Titanium
  - Tlc..... Talc
  - V..... Vanadium
  - W..... Tungsten
  - Zn..... Zinc
  - Zr..... Zirconium

