

# Onslow

## Regional HotSpots Land Supply Update

November 2011



Western  
Australian  
Planning  
Commission



Department of  
Planning

# Onslow

Regional HotSpots Land Supply Update

November 2011



#### Disclaimer

This document has been published by the Western Australian Planning Commission. Any representation, statement, opinion or advice expressed or implied in this publication is made in good faith and on the basis that the government, its employees and agents are not liable for any damage or loss whatsoever which may occur as a result of action taken or not taken, as the case may be, in respect of any representation, statement, opinion or advice referred to herein. Professional advice should be obtained before applying the information contained in this document to particular circumstances.

© State of Western Australia

Published by the  
Western Australian Planning Commission  
140 William Street  
Perth WA 6000

Locked Bag 2506  
Perth WA 6001

Published November 2011  
Data current as at September 2011

website: [www.planning.wa.gov.au](http://www.planning.wa.gov.au)  
email: [corporate@planning.wa.gov.au](mailto:corporate@planning.wa.gov.au)

tel: 08 655 19000  
fax: 08 655 19001  
National Relay Service: 13 36 77  
infoline: 1800 626 477

Western Australian Planning Commission owns all photography in this document unless otherwise stated.

This document is available in alternative formats on application to Communication Services.

# Contents

<b>1</b>	<b>Executive summary</b>	<b>1</b>
1.1	Context	1
1.2	Key points	1
1.3	Regional HotSpots and the Urban Development Program	5
1.4	Pilbara Cities	5
1.5	Onslow overview	6
<b>2</b>	<b>Economic outlook and business investment</b>	<b>8</b>
2.1	Economic outlook	8
2.2	Business investment	9
2.3	Tourism	14
2.4	Other industries	15
<b>3</b>	<b>Population and employment profile</b>	<b>16</b>
3.1	Estimated resident population	16
3.2	Population structure	17
3.3	Population stability	19
3.4	Household formation	20
3.5	Industry of employment	20
3.6	Income distribution	20
3.7	Working patterns	22
3.8	Labour force	23
<b>4</b>	<b>Population and employment projections</b>	<b>24</b>
4.1	Employment forecasts – State Government	25
4.2	Population and employment projections – Onslow Townsite Strategy	35
4.3	Population and employment projections – PICC	35
4.4	Resident population projections – WAPC	38
4.5	Population targets – Pilbara Cities	39
<b>5</b>	<b>Land and housing demand</b>	<b>41</b>
5.1	Residential land sales	42
5.2	House and unit sales	42
5.3	Building approvals	43
5.4	Residential building costs	44
5.5	Residential rentals	45
5.6	Pilbara Towns Housing Study	46
5.7	Onslow Townsite Strategy development scenarios	47
5.8	Housing demand scenario based on State Government employment/population forecasts	48
5.9	Demand for transient workforce accommodation	49
5.10	Demand for service worker accommodation	50
5.11	Demand for State Government housing	50
5.12	Demand for industrial land	51
5.13	Demand for commercial/retail floor space	52
5.14	Demand for tourist accommodation	52



<b>6</b>	<b>Land and housing supply</b>	<b>55</b>
6.1	Issues affecting delivery of land and housing to market	56
6.2	Planning context	56
6.3	Coastal environment	61
6.4	Native Title and heritage	62
6.5	Role of LandCorp	63
6.6	Role of Department of Regional Development and Lands	63
6.7	Role of Department of Housing	63
6.8	Residential	64
6.9	Transient workforce accommodation	72
6.10	Aged persons housing	74
6.11	Industrial	74
6.12	Commercial/retail	76
6.13	Tourism	77
<b>7</b>	<b>Infrastructure</b>	<b>88</b>
7.1	Water	90
7.2	Drainage and flooding	92
7.3	Wastewater	92
7.4	Power	94
7.5	Transport	96
7.6	Education	100
7.7	Health	103
7.8	Police, justice and emergency services	106
7.9	Communications	107
7.10	Other community infrastructure	108
7.11	Waste management	112
7.12	Basic raw materials	113
7.13	Infrastructure summary	114
<b>8</b>	<b>Royalties for Regions</b>	<b>120</b>
8.1	Delivery mechanisms	120
8.2	Decision making criteria	120
<b>9</b>	<b>Glossary</b>	<b>122</b>
<b>10</b>	<b>References</b>	<b>125</b>
<b>11</b>	<b>Websites and resources</b>	<b>129</b>
<b>12</b>	<b>Acronyms and abbreviations</b>	<b>130</b>
<b>13</b>	<b>Acknowledgements</b>	<b>131</b>

### List of figures

Figure 1: Pilbara Cities governance structure (State Government)	6
Figure 2: Census 2006 age sex profile – Onslow	18
Figure 3: Census 2006 age sex profile – Shire of Ashburton	18
Figure 4: Census 2006 age sex profile – Western Australia	18
Figure 5: Census 2006 place of usual residence 1 and 5 years ago – Onslow	19
Figure 6: Census 2006 place of usual residence 1 and 5 years ago – Western Australia	19
Figure 7: Census 2006 industry of employment – Onslow	21
Figure 8: Census 2006 income distribution – Onslow, Pilbara and Western Australia	21
Figure 9: Census 2006 working patterns by industry – Shire of Ashburton	22
Figure 10: Potential project timing	29
Figure 11: Forecast employment/population growth to 2025 – ANSIA and Onslow townsite	32
Figure 12: Forecast employment/population growth to 2025 – Onslow townsite	32
Figure 13: PICC resource related employment (2008 and 2010 projections) – Pilbara region	36
Figure 14: Construction employment projections (2008 to 2020) – Pilbara region	37
Figure 15: Combined resident, FIFO and construction workforce projections by location	37
Figure 16: WAPC age sex profile 2021 – Shire of Ashburton	39
Figure 17: Residential land sales 1994 to 2010 – Onslow	42
Figure 18: House sales 1994 to 2010 – Onslow	43
Figure 19: Building approvals 2001 to 2010 – Onslow	44
Figure 20: Average building costs per square metre for new houses – 2000 to 2010	45
Figure 21: 2006 Census weekly rent by landlord type (occupied private dwellings being rented) – Onslow	46
Figure 22: Onslow Townsite Strategy development scenarios	47
Figure 23: Purpose of visit to the Shire of Ashburton visitors 2008/09/10	53
Figure 24: Shire of Ashburton visitor nights, annual average visitors 2008/09/10	53
Figure 25: Residential conditional and final approvals 1999/2000 to 2009/10 – Onslow	65
Figure 26: Residential land development pipeline – Onslow	67
Figure 27: Hotels, motels and serviced apartments with more than five rooms – Shire of Ashburton	78

### List of tables

Table 1: Key economic forecasts, statistics and assumptions for Western Australia	9
Table 2: Major projects (selected)	10
Table 3: Estimated resident population 2002 to 2010 – Shire of Ashburton	17
Table 4: Census 2006 locality populations – Shire of Ashburton	17
Table 5: Census 2006 household types – Onslow	20
Table 6: Employment/population breakdown by project – to 2017	27
Table 7: Employment/population breakdown by project – beyond 2017	28
Table 8: Employment/population forecasts – 2011 to 2025	31
Table 9: Development scenarios – Onslow Townsite Strategy	35
Table 10: PICC Combined resident, FIFO and construction projections 2010 to 2020 – Onslow	37
Table 11: WAPC population projections 2011 to 2031	39
Table 12: Development scenarios – Onslow Townsite Strategy	47

Table 13:	Forecast additional dwelling unit requirements (family/single/FIFO) – 2011 to 2017	48
Table 14:	Department of Housing dwelling stock (social and GROH housing) – Onslow	50
Table 15:	Census 2006 dwelling stock – Onslow	64
Table 16:	Integrated land information database outputs – Onslow	65
Table 17:	Residential zoned land supply – Onslow	66
Table 18:	Rural living zoned land supply – Onslow	66
Table 19:	Residential land release summary – Onslow	69
Table 20:	Forecast additional dwelling unit requirements (family/single/FIFO) – 2011 to 2025	70
Table 21:	Industrial zoned land supply – Onslow	74
Table 22:	Industrial land release summary – Onslow	76
Table 23:	Commercial/retail zoned land supply – Onslow	77
Table 24:	Tourism accommodation summary – Onslow	79
Table 25:	Tourism zoned land supply – Onslow	79
Table 26:	Tourism accommodation development summary – Onslow	80
Table 27:	Project summaries – Onslow	82
Table 28:	Onslow school enrolment trends: 2007 to 2011 (semester one)	100
Table 29:	Hospital facilities – Pilbara region	103
Table 30:	Recreation facilities – Onslow	108
Table 31:	Infrastructure summary – Onslow	114
Table 32:	Pilbara - Regional Infrastructure and Headworks Fund 2009/10	121
Table 33:	Shire of Ashburton – Country Local Government Fund 2010/11	121

## List of maps

Map 1:	Future Development Overview – Onslow	132
Map 2:	Major Projects (selected) – Onslow	133
Map 3:	Ashburton North Strategic Industrial Area	134
Map 4:	Decade of construction (first build)/vacant lots – Onslow	135
Map 5:	Tenure – Onslow	136
Map 6:	Future Development – Onslow	137
Map 7:	Water Infrastructure – Onslow	138
Map 8:	Wastewater Infrastructure – Onslow	139
Map 9:	Power Infrastructure – Onslow	140
Map 10:	Transport Infrastructure – Onslow	141
Map 11:	Other Infrastructure – Onslow	142

## Appendices

Appendix A:	Employment/population flowcharts by project	143
-------------	---	-----

# 1 Executive summary

## 1.1 Context

Onslow is located southwest of Karratha on the coast of the Pilbara region, some 1386 km north of Perth, Western Australia.

Historically, Onslow's marine industry supported inland wool-growing, gold mining and pearling; however, the harbour function of the town has since developed to support growth in the fishing and resource sectors, and more recently the exploitation of offshore oil and gas reserves. Onslow's other industries include salt production and export, fishing and tourism. Over the last decade or so, Onslow Salt has been the town's largest employer, with all operational workers being locally based.

Changes for Onslow as a result of the State Government's 2008 announcement to establish the Ashburton North Strategic Industrial Area (ANSIA) 11 km southwest of Onslow have already begun.

BHP Billiton Petroleum's Macedon, and Chevron Australia's Wheatstone, domestic gas and processing projects are fully committed and construction has already commenced for Macedon. Another proponent – BHP Billiton Petroleum/Exxon Mobil (Scarborough project) – has also been temporarily granted land to investigate feasibility of establishing gas processing facilities at the ANSIA. A final investment decision on the Scarborough project is not expected in the near future. Development of the hub includes potential establishment of downstream industries associated with oil and gas products.

Without oil and gas development, or expansion of salt operations, no significant growth of the town's 700 strong population would have been expected. Recent resource project commencements have already impacted on the town.

This document is part of the Regional HotSpots series which has been prepared as part of the Urban Development Program (UDP), and is the result of consultation with a number of stakeholders, including local government and servicing authorities. The series also supports the *Pilbara Planning and Infrastructure Framework*, the Pilbara Infrastructure Implementation Plan, and will inform infrastructure planning work currently being undertaken by service providers.

## 1.2 Key points

- Recent growth trends in Onslow have been negligible with the exception of a brief period in the late 1990s and early 2000s coinciding with the development of the salt industry. Development at the ANSIA will have major implications for the town. Impacts will vary according to the number of resource projects that establish there, whether downstream industries will also locate, the timing of these, and the work and living practices adopted by the major employers.
- Land development and use within the town is constrained by storm-surge and flood risk; the need for Native Title clearances; a number of noise and odour buffers associated with Onslow Salt, Onslow airport and other infrastructure; limited water supply; and key utility infrastructure reaching maximum capacity.
- The local government (Shire of Ashburton) is actively taking on an investment role in the town with such projects as developing an industrial estate at the Onslow airport.
- There is sufficient zoned land to meet past growth demand trends; however, the recent decision by Chevron Australia to exploit the Wheatstone gas field and locate onshore processing at the ANSIA triggers the need for additional land to be rezoned, approved for subdivision and developed.

## Economic outlook and business investment

- Onslow's economy is influenced primarily by the fortunes of the oil, gas and salt industries. To a lesser extent Onslow also relies on commercial fishing and tourism.
- To support the long-term economic development of the oil and gas sector, planning for the 8000 ha ANSIA is currently under way. The ANSIA is located approximately 11 km southwest of Onslow.
- The ANSIA has been identified by the State as a favourable strategic area to cater for the development of a gas processing, storage and export hub, with the overall vision of creating an industrial estate that successfully and safely manages the varied land uses in the area.



- Two foundation proponents (Chevron Australia and BHP Billiton Petroleum) have been allocated land within the ANSIA for gas processing. Other future industries that may potentially establish in the ANSIA include those associated with ammonia-urea, ammonium nitrate, methanol and power generation.
- BHP Billiton Petroleum's Macedon project and Chevron Australia's Wheatstone project are fully committed.
- The ANSIA will feature common use facilities including infrastructure and suitable access corridors for all users, a common user coastal area and port facilities.

## Employment and wages

- Major employers in town are Onslow Solar Salt, businesses servicing off shore oil and gas activities and commercial fishing operations.
- Traditionally, average wages in Onslow have been lower than Western Australian average wages.
- Development within the ANSIA will generate employment opportunities on a large scale for short-term construction workers and will also have a significant impact on permanent long-term employment for those directly and indirectly involved with new projects.
- Employment/population forecasts prepared by State Government agencies indicate some significant impacts between 2011 and 2016 before a significant step change in population in 2017 (total population of 2201) and 2022 (total population of 3756) as a result of liquified natural gas (LNG) projects entering the operational phase. These estimates are based on various assumptions regarding consequential and indirect workforce multipliers, single/family status of workers and the fly-in, fly-out (FIFO) and resident workforce components.
- Construction workforces based at the ANSIA could reach around 6500 persons (may be higher or lower based on project timing) at any one time.
- The town's other industry sectors of commercial fishing and tourism are unlikely to experience any significant employment growth in the short to medium term,

although tourist accommodation facilities may experience pressure for use by corporate travellers associated with resource projects.

## Population

- The Australian Bureau of Statistics (ABS) provides an annual statistic of the estimated resident population (ERP) which is more accurate than the figures from the Census of Population and Housing as ERP corrects for the undercount and discrepancies associated with multiple places of residence from the 2006 Census. A limitation of ERP is that it does not include transient workers. The Pilbara region has a large number of transient workers (including FIFO) who are not included in ERP.
- The Shire of Ashburton (the Shire) had an ERP of 6730 persons in June 2010. Onslow accounted for just under 10 per cent of the Shire's population in the 2006 Census with 576 persons stating Onslow was their place of usual residence. According to Shire of Ashburton estimates, Onslow currently has a resident population of approximately 700. There are no other formal estimates of population available for Onslow. Other settlements within the Shire of Ashburton include Tom Price, Paraburdoo and Pannawonica.
- The town accommodates a fluctuating number of short-term contract workers and is also impacted by a large number of visitors during peak tourism season, exacerbating the difficulty in determining the total service population.
- Approximately one third of Onslow's residents are Indigenous. The nomadic nature of this population group may have contributed to differential counts in the population of Onslow.
- In comparison to other Pilbara towns, Onslow has a larger proportion of its resident population aged 65 and over.
- Baseline resident population growth in Onslow is weak; therefore, any significant population growth will depend on business investment in oil and gas and/or salt projects.

- Population numbers and levels of residential permanency will significantly fluctuate according to development stages of the ANSIA and FIFO work practices adopted by major employers.

### Zoned and development land

- Map 1 shows existing and future development areas in Onslow.
- There is currently approximately 94 ha of undeveloped residential zoned land in Onslow. Much of this land; however, is not available for immediate development due to the need to resolve planning, tenure, environmental and infrastructure development constraints.
- The *Onslow Townsite Strategy* identifies approximately 147 ha for future development (excluding areas identified for industrial uses), of which 81 ha is currently zoned Residential or Urban Development.
- Structure planning for the greenfield land identified in the *Onslow Townsite Strategy* is to be completed by 2012. It will detail how the residential and commercial expansion of the town can occur over some 150 ha of vacant land.
- There is approximately 9 ha zoned for commercial and civic uses in Onslow, of which a total of 1 ha is vacant and undeveloped. Much of the zoned area is occupied by single residential dwellings with very limited commercial activity.
- As at March 2011, there was approximately 577 ha of land zoned for industrial uses in Onslow, the majority of which is zoned for strategic industry. The existing industrial estate is almost fully utilised and additional land will be required in the short to medium term to support anticipated resource development and growth in Onslow.
- Approximately 490 ha is zoned for strategic industry and currently undeveloped. The majority of this area is the subject of a local scheme amendment to revert back to a rural zoning with the alternative strategic industry site being located at the ANSIA.

- There is approximately 25 ha of land zoned for tourism purposes in Onslow, 18 ha of which remains undeveloped. This land is located on Onslow's foreshore. Development of tourism uses may also be permitted in the Commercial and Civic Zone.

### Subdivision and building approvals

- There has been little residential subdivision activity over recent years in Onslow. At 30 June 2011, there were only 10 residential lots with conditional approval for subdivision.
- Over the period 1999/00 to 2010/11, the town of Onslow has recorded minimal industrial subdivision activity, with only one subdivision application (two lots) lodged during this time.
- Residential building approval activity has been traditionally low in Onslow; however, recent inactivity may be more related to lack of availability of water connections than lack of demand.

### Land and housing demand

- The median sales price for vacant residential lots in Onslow more than doubled during the period 2006 to 2009, although this data should be used with caution given the low number of sales recorded. The median sales price for (year to December) 2009 was \$180,000 which is approximately \$44,000 less than that recorded for the Perth metropolitan area. No vacant land sales were recorded in 2010.
- The median house price for Onslow is currently higher than that recorded in Perth (\$615,000 compared with \$496,000 for the year to December 2010). The median house price has increased sixfold in the past seven years, recording a median of \$100,000 in 2003.
- Rents have also increased substantially with few properties currently available, with weekly rents of more than \$2000 being recorded.
- Building costs in the Pilbara region are significantly higher than that of the Perth metropolitan region. This is due to a number of factors including a lack of competition, distance and freight costs, increased

building standards due to environmental factors (for example cyclones) and high labour costs as a result of labour shortages. Increased costs may contribute to disincentive to invest in housing.

- For Onslow, the Pilbara Towns Housing Study (unpublished) estimates a current apparent demand for 34 dwellings; a latent demand for 71 dwellings; and future demand of 3, 466 and 808 dwellings under low, medium and high growth scenarios respectively by 2015.
- The *Onslow Townsite Strategy* estimates a need for 800 to 1600 additional dwellings under medium and high growth scenarios requiring approximately 81 to 162 ha of gross residential land.
- Using State Government employment/population forecasts, there is a need for an additional 676 dwellings (495 family and 181 single units) within the townsite, two transient workforce accommodation camps for operational workers (one with 20 bed capacity and one with 225 bed capacity) and an ANSIA based camp for construction workers (up to 5000 beds) by 2017. Dwelling needs beyond 2017 are less certain, however, a second LNG plant and development of downstream processing industries will significantly increase accommodation needs.
- The Shire of Ashburton estimates a further imminent need for temporary accommodation for up to 750 workers associated with other works such as road maintenance and construction, aerodrome construction, town amenity upgrades, residential development and other construction. This requires further planning and investigation which has been initiated as a partnership between LandCorp, the Shire of Ashburton and Chevron Australia.
- Growth of services will lead to increased demands for Government Regional Officers' Housing and key service worker accommodation. The Shire of Ashburton has advised that limited accommodation for key service workers is already impacting the town which could affect the short term viability of some small businesses in the area.

- Increased growth is also likely to place increased pressures on social housing resources.
- There is a need for a detailed housing strategy to address the range of accommodation needs of Onslow.
- Demand for industrial land has not been quantified, although if resource projects proceed, additional industrial land will be required to accommodate a range of support industries.
- Future commercial land and floorspace needs have not been formally investigated and may become more apparent with development of the townsite structure plan and the town centre revitalisation plan. Preparation of a commercial/retail strategy may need to be considered.

### Land release

- Development of residential infill sites is anticipated to commence in the short term. The development of housing on these sites will assist in addressing latent and short term demand.
- The need for detailed structure planning and the requirement to resolve other complex development and infrastructure issues in Onslow indicates that significant additional (greenfield) land for housing may not become available in the short term. If anticipated growth is realised, supply may only meet demand in the medium term.
- Planning is progressing for the development of light industrial/mixed business lots at the Shire of Ashburton's Onslow Airport Enterprise Centre. It is anticipated that precinct 1 of this project will be developed in the short term.
- Strategic and general industrial land needs will be met with proposed land releases at the ANSIA.
- The Department of Transport (DoT) is in the process of releasing additional lease areas at Beadon Creek Maritime Facility for harbour and marine associated development.

## Infrastructure

- Power, water and wastewater infrastructure are currently operating above capacity or will reach capacity in the very short term. Significant infrastructure investment is required to meet current land and housing demand pressures. Even with business as usual, there is restriction on development and building activity due to limitations of utility infrastructure capacity that needs immediate attention.
- Provision of infrastructure to service the anticipated development growth within the townsite will require significant funding and improved coordination from government, major foundation proponents, agencies and service providers.
- The extent of physical and social infrastructure demand requirements for the Onslow townsite greatly depends on the certainty of major projects, the residential nature of operational workforces (FIFO or residential based), the family status of operational workforces and associated key service workers and contractors, directly or indirectly resulting from the operation of the major projects.
- A key feature of the Pilbara Cities blueprint is to improve the liveability of regional centres by investing in community infrastructure and facilities.

## 1.3 Regional HotSpots and the Urban Development Program

The Regional HotSpots series sets out to assess land for future residential, industrial and commercial uses and identifies the planning and infrastructure coordination needed to meet demand across selected regional centres in Western Australia. The series has been prepared by the Department of Planning (DoP), for the Western Australian Planning Commission (WAPC).

The reports include key information on the following topics:

- demand drivers specific to each regional centre including the major economic factors that influence employment and population growth – and therefore the demand for land and housing;

- actions needed to release additional land for development;
- assessment of zoned land supply for residential, commercial, industrial and tourism uses;
- recent and future land development activity; and
- information on existing physical and social infrastructure and future requirements.

This Regional HotSpots series has been prepared as part of the Urban Development Program (UDP) and is the result of consultation with a number of stakeholders, including local government and servicing authorities. The series will also act as a key component of the *Pilbara Planning and Infrastructure Framework* and *Pilbara Infrastructure Implementation Plan*.

The most recent edition of all the Regional HotSpots publications can be accessed online at: [www.planning.wa.gov.au](http://www.planning.wa.gov.au)

## 1.4 Pilbara Cities

On 27 November 2009, the State Government announced the Pilbara Cities blueprint, an initiative to encourage more people to live and settle in the Pilbara. The State Government's vision for Pilbara Cities is for modern vibrant regional centres that can support and deliver a skilled workforce for major economic projects in the Pilbara. The realisation of this vision rests on the promotion of quality regional living with modern services and facilities which will encourage the development of strong local communities. The blueprint includes proposals for major revitalisations of South Hedland, Karratha, Newman, Dampier, Tom Price and Onslow town centres, in addition to plans to create new marinas and improved waterfronts at Port Hedland, Dampier and possibly Onslow. New infrastructure and facilities such as schools, TAFEs, medical facilities, leisure and entertainment facilities and retail precinct are also proposed as part of the plan. The initiative also aims to maximise opportunities for Indigenous communities.

Critical to the success of the plan is the attraction of residents and businesses not involved in the traditional mining, oil and gas sectors in the region, creating places where people choose to settle on a permanent basis with access to high standards of services.



## 1.5 Onslow overview

To be successful, the Pilbara Cities vision must build on the joint contribution of the private sector, State Government and Australian Government to support the development and prosperity of the region. The private sector will play a crucial role in achieving the plan, including assisting with the delivery of affordable accommodation solutions by the release of development sites and superlots for the development of land and housing, including opportunities in the private rental market.

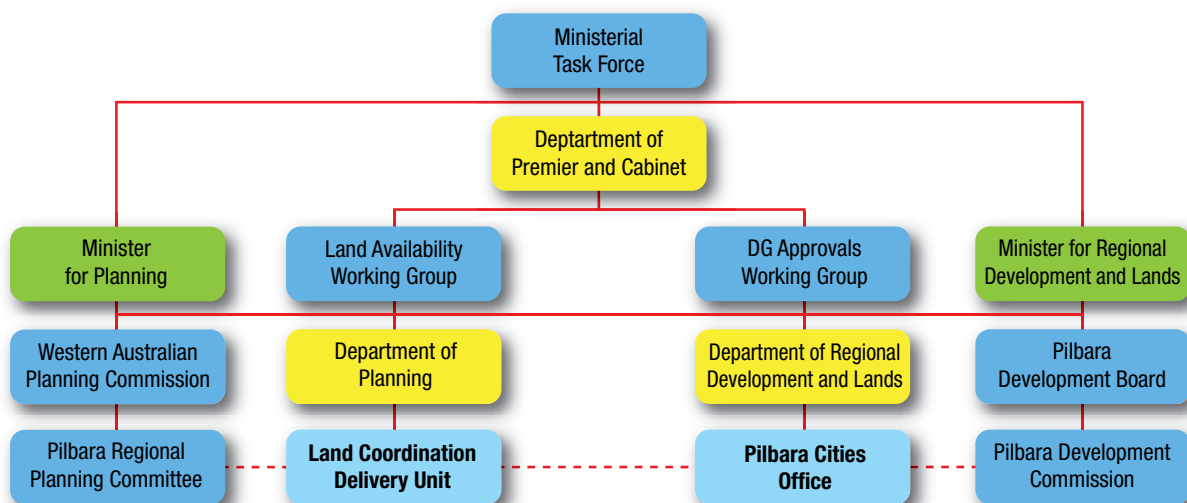
The relationship between key State Government agencies and groups is outlined in Figure 1.

The area around Onslow is the traditional home to the Thalanyji People. The Thalanyji cultural tradition is associated with the rainbow serpent Burra Balanyji that created underground tunnels in the area which link all of the water bodies around Onslow.

Onslow is the key coastal township in the Shire of Ashburton and is located 1386 km north of Perth. Founded in 1883 and gazetted in 1885, as a port at the mouth of the Ashburton River, Onslow developed a commercial marine industry with basic shipping activities to support inland wool-growing and gold mining, which continued to be major industries for 80 years. Cattle farming has since replaced sheep running as the predominant inland agricultural enterprise.

In the early settlement days Onslow became a home port for pearling luggers, which operated in the nearby Exmouth Gulf. Due to repeated cyclone damage and the flooding/silting of the Ashburton River, the townsite was moved in 1925 to its current location, 18 km northeast of Old Onslow, to take advantage of the deeper waters of Beadon Creek. Since then, the port function has developed to support growth in the fishing and resource sectors and more recently the exploitation of offshore oil and gas reserves.

Figure 1: Pilbara Cities governance structure (State Government)



The town was also actively involved in World War II, providing refuelling facilities at the jetty. Evidence of this activity still exists with large tanks located throughout the town. Onslow was the southern-most town in Australia to be bombed by the Japanese in World War II. The Navy also used Onslow as a base in the 1950s while conducting tests on the nearby Montebello Islands.

Following the discovery of oil and gas in the mid 1980s near Thevenard Island, 22 km northwest of Onslow, a production facility was established in 1989. Production at the onshore Tubridgi gas field (Tubridgi Joint Venture) commenced in 1991, and extraction of oil and gas from the Griffin and Chinook-Scindian offshore fields commenced in 1994. Production at the Tubridgi and Griffin joint venture operations ceased in 2005 and 2009 respectively. During the 1980's, Onslow was also a service base for oil and gas development at Barrow Island.

Salt production commenced at Onslow in 1999 with exports occurring in 2002. Onslow Salt is a major employer within the town, with all operational workers being locally based. Some small scale expansion is planned.

Tourism is an important industry for Onslow, attracting holiday makers travelling along the North West Coastal Highway as well as residents of the region's inland mining towns. The Shire of Ashburton advises that Onslow's attraction as a tourist destination can see the town's population swell to over a 1000 during the winter months. A small but consistent number of retirees stay in Onslow for extended periods during winter, enjoying the relaxed and quiet lifestyle. Thevenard Island and Direction Island provide tourist accommodation for people wishing to fish and dive the 10 coral atoll islands that make up the Mackerel Islands. Recreational fishing also takes place in and around Onslow itself.

According to Shire of Ashburton estimates, Onslow currently has a resident population of approximately 700 people; however, the population often swells to more than 1000 persons when FIFO workers and visitors are counted.

#### Overview – for more information see the following links:

Australian Bureau of Statistics: [www.abs.gov.au](http://www.abs.gov.au)  
see 2006 Census QuickStats: Onslow (urban centre/locality)

Pilbara Development Commission:  
[www.pdc.wa.gov.au](http://www.pdc.wa.gov.au)

Shire of Ashburton: [www.ashburton.wa.gov.au](http://www.ashburton.wa.gov.au)

Spotlight on the Pilbara:  
[www.regionalspotlights.com.au](http://www.regionalspotlights.com.au)

## 2 Economic outlook and business investment

### Key points

- Improved economic conditions have contributed to a positive outlook for business investment in the oil and gas sector, which could result in Onslow becoming a major hub for onshore gas processing and exportation to domestic and international markets in the short to medium term and for downstream industries in the longer term.
- Committed and potential major investments by Chevron Australia, BHP Billiton Petroleum and Exxon Mobil are likely to result in short-term major impacts from construction investment initially and then longer-term employment benefits to Onslow.
- Improving salt prices may accelerate plans to increase production by Onslow Solar Salt.
- A firmer outlook for salt, oil and gas will influence investment decisions and therefore employment and population prospects in Onslow.
- Increased demand from China and other developing economies will drive growth in the energy and minerals commodity markets over the medium term.
- The outlook for Onslow's other economic sectors (such as commercial fishing and tourism) is unlikely to drive any significant change in the demand for land or housing.

Onslow sits in close proximity to strategic oil and gas reserves of the southern Carnarvon Basin, and is well located to take advantage of the world's growing demand for energy resources. Currently, Onslow's main industries are salt production and export, commercial fishing and tourism. While the economic outlook for Onslow is linked to the continued operation and investment in these existing industries, the establishment of key industrial and resource projects within the ANSIA will likely result in significant step-change growth of Onslow over the next decade.

As Onslow's economy benefits from both the onshore processing and the servicing of marine vessels associated with the oil and gas industry, the outlook for global energy demand heavily influences the town's prosperity.

### 2.1 Economic outlook

Western Australia's mineral and petroleum industry plays a key role in the economy of the State and the nation, reaching a value of \$91.6 b in 2010 and accounting for 91 per cent of the State's and 44 per cent of the nation's total merchandise exports. The majority of these exports originate from the State's Pilbara region which accounts for 48 per cent of the value of mineral and petroleum production in Western Australia, with offshore petroleum accounting for an additional 27 per cent of the total value.

Strong growth in developing economies including China and India has underpinned a steady demand for the State's mineral and petroleum products over recent years and this is expected to continue in the coming years. The resources industry has proven to be resilient during recent uncertain economic times and is well positioned to build on its strengths as a reliable supplier of quality commodities at world cost-competitive prices. Based on forecast demand and commodity prices, the outlook for the minerals and petroleum industry is very positive.

The *Australian Commodities March Quarter 2011* report produced by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) reports that prices for energy and mineral commodities are forecast to remain high in the short term, with strong increases in demand (China and developing economies) underpinning growth in energy and minerals commodity markets over the medium term.

In 2010, Australia's energy and mineral commodity export earnings totalled \$165 b, 25 per cent higher than 2009. This increase was supported by higher export volumes and higher prices for a range of commodities. Energy and mineral export earnings are forecast to increase to around \$186 b in 2010/11, and to around \$219 b (in 2010/11 dollars) in 2015/16. This is driven by forecast higher export prices and volumes for most commodities.

In terms of LNG, the volume of Australian exports in 2010 increased by 6 per cent to 18 million tonnes (Mt), and earnings by 15 per cent to \$8.8 b. These increases were the result of higher production from the North West Shelf project. Over the next five years, the volume of Australia's LNG exports are projected to increase at a rate of 15 per cent per year, underpinned by a number of new projects under construction (including Gorgon), rising to 41 Mt by 2015/16. This volume may rise further beyond

## 2.2 Business investment

this time if a number of projects currently at the feasibility stage progress to construction. The value of the State's LNG industry in 2010 was recorded at \$8.8 b, with production increasing by 8 per cent to 16.5 Mt on 2009 figures. Western Australia is currently the world's sixth largest LNG exporter. The State's LNG production could reach more than 60 million tonnes per annum (Mt/a) by 2020.

The economic outlook for Western Australia is for a return to strong growth over the next few years as business investment recovers strongly and takes the place of public investment as the primary stimulus for the State's economy. This is demonstrated by the components of the Gross State Product (Table 1).

The Access Economics *Investment Monitor December 2010* reports a rise in the value of investment projects across the nation, dominated once again by resource projects, supported by the continuing rise of global commodity prices. Approximately 29 per cent of the total investment lies in Western Australian projects, the largest investment of any of the states, which has more than doubled its share of new capital investment over the past 10 years.

The *Western Australian Mineral and Petroleum Statistics Digest 2009/10* reports capital investment in committed or under construction LNG projects across the State at approximately \$56 b, with investment in planned or possible LNG projects totalling \$108 b. This will likely drive another phase of growth over the coming years, with the State potentially becoming the world's second largest exporter of LNG by 2020.

**Table 1: Key economic forecasts, statistics and assumptions for Western Australia**

	2009/10 actual (%)	2010/11 estimated actual (%)	2011/12 budget estimate (%)	2012/13 forward estimate (%)	2013/14 forward estimate (%)	2014/15 forward estimate (%)
<b>Gross State Product and selected components</b>						
Gross State Product growth	4.3	4.0	4.5	4.0	4.0	4.0
State final demand growth	3.1	4.75	7.25	4.5	2.5	1.5
Business investment growth	-2.4	10.0	15.0	8.0	2.5	-2.5
Dwelling investment growth	2.8	1.0	3.0	4.0	4.5	4.5
Government investment growth	31.1	3.5	8.0	-10.0	-14.5	-3.0
<b>Key economic statistic forecasts</b>						
Employment growth	0.3	3.0	2.5	2.5	2.25	2.0
Unemployment rate	5.0	4.5	4.5	4.25	4.25	4.0
Wage price index growth	3.3	4.0	4.25	4.5	4.5	4.5
Average weekly earnings growth	5.5	3.5	4.5	5.0	5.5	5.5
Population growth	2.4	2.3	2.2	2.2	2.1	2.1
<b>Other key economic forecasts and assumptions</b>						
Oil price (US\$ per barrel)	75.2	90.1	108.0	105.0	102.6	101.4
US\$ / A\$ (cents)	88.3	98.0	97.5	90.6	83.7	76.9
Iron ore price (US\$ per tonne)	74.9	138.8	149.1	128.8	108.2	87.5
Iron ore royalties (\$m)	1813	3593	4137	4313	4749	4635
Petroleum royalties (\$m)	25	26	36	36	34	35



Numerous major discoveries of oil, gas and condensate have been made over the past 50 years, with the State ranking among the best areas in the world for petroleum exploration. The majority of the nation's spend on petroleum exploration occurs in Western Australia, accounting for approximately 71 per cent (or \$2.5 b) of the total spend in 2009/10. The focus of exploration activity is currently the Carnarvon and Browse offshore basins. There are a number of under-explored areas across the State that have potential for larger discoveries in the future.

Table 2 lists proposed major investments that are likely to affect demand for land and housing in Onslow. The location of these projects in relation to Onslow is shown in Map 2.

Salt

The State's North West is home to the nation's largest salt fields and currently accounts for approximately 80 per cent of the nation's salt production. The Pilbara region has a highly suitable climate for salt production, with high evaporation levels relative to the region's annual rainfall. Salt is primarily used as a feedstock for the production of chemicals, glass and plastic, and the rapid growth of the chemical industry in eastern Asia over the past 50 years has led to a number of salt fields being established in the northwest of the State.

In 2010, the volume of Western Australian salt sales rose by 15 per cent to nearly 11.6 Mt; however, sales value fell by 13 per cent to \$388 m. ABARES forecasts national production of salt to reach 12.2 Mt in 2010/11 and 11.9 Mt in 2011/12.

Currently, the State's largest exporter is Dampier Salt, which has operations at Dampier, Port Hedland and Lake MacLeod. Dampier Salt is also the world's largest exporter of high-quality bulk solar salt.

Onslow Salt is the second largest exporter of salt in the State. Its operations cover an area of approximately 8600 ha and have the capacity to produce 2.5 Mt/a. The project involves pumping seawater from Beadon Creek into a system of condenser ponds. Liquid is then pumped to crystallisers, where over a period of months salt crystals grow to a thickness to allow harvesting to occur. Harvested salt is trucked to a wash plant and then conveyed to an 800 tonne (t) capacity stockpile. When ready, the salt is transported on an overland conveyor and then exported

via a 1.3 km steel trestle-type jetty located at Onslow's Sunset Beach, which is capable of berthing vessels up to 50,000 t. A 10 km dredged shipping channel has also been constructed. The project, established under a State Agreement (*Onslow Solar Salt Agreement Act 1992*) commenced exports in July 2002.

The *Western Australian Mineral and Petroleum Statistics Digest 2009/10* reported that Onslow Solar Salt employed 143 persons in 2009, a drop of 18 employees from 2008. This equates to

approximately 18 per cent of all individuals employed in salt production across the State. Onslow Salt's policy of a 100 per cent locally based workforce has provided a significant boost to Onslow, and has generated the construction of 39 homes in Onslow, with a further 10 to be constructed in 2011. The Shire of Ashburton has advised that Onslow Salt is seeking a further 20 lots, and planning for this is identified in the process of developing the town's structure plan.

Onslow Salt was acquired by the Japanese company Mitsui and Co., Ltd from Akzo Nobel N.V. in 2006. Mitsui also controls the Shark Bay Salt Joint Venture, making it the third-largest salt supplier in the Asian market. Onslow Salt provides a stable supply of salt for major Asian chlor-alkali manufacturers, particularly those in Japan, Korea, Indonesia and Taiwan. Demand for salt from chlor-alkali manufacturers has increased rapidly in recent years, with limited supplies of good quality salt placing pressure on the demand/supply balance.

Table 2: Major projects (selected)

Proponent / project	Resource / commodity	Location		Nearest centre	Production	Capital investment (\$)	Construction workforce <sup>1</sup>	Additional permanent workforce <sup>1</sup>	Project life	Start	Status / comment
Under construction / committed											
Apache Energy Ltd/ Santos – Halyard & Spar gas fields	Natural gas	120 km north of Onslow		Onslow	50 TJ/d increasing to 100 TJ/d by early 2013	\$133 m	unknown	unknown	15 yrs	Mid 2011 (Halyard) Late 2012 (Spar)	Domestic gas project. Gas to be piped to Varanus Island for processing.
BHP Billiton Petroleum Pty Ltd/Apache Energy – Macedon domestic gas project	Natural gas	100 km west of Onslow LNG processing at Ashburton North Strategic Industrial Area (11 km southwest of Onslow)		Onslow	200 TJ/d	US\$1.5 b	300	16	10-15 yrs	2013	Domestic gas project. Project has environmental approval. Construction expected to commence 2011. Gas production to commence 2013.
Chevron/Apache/ KUFPEC Wheatstone LNG development (including Brunello/Julimar fields)	Natural gas	145 km north of Onslow (source Wheatstone and Iago gas fields) LNG processing at Ashburton North Strategic Industrial Area (11 km southwest of Onslow)		Onslow	2 x LNG trains (combined capacity of 8.9 Mt/a) 250 TJ/d domestic gas plant	\$29 b	3000-5000	300	50 yrs+	First gas late 2016	Chevron Australia entered front end engineering design (FEED) July 2009. Final investment decision announced 26 September 2011. Peak construction workforce 4300 as advised by Chevron, May 2011. Site works to commence late 2011.
Total investment / workforce (projects under construction / committed)						US\$30.6 b	3300	316			
Prefeasibility											
BHP Billiton Petroleum Pty Ltd/ExxonMobil Pilbara LNG plant (Scarborough gas field)	Natural gas	280 km northwest of Onslow		Onslow	6 Mt/a LNG train	US\$15-20 b	2400	125	25 yrs+	Beyond 2015	Various development options being considered including stand alone onshore LNG plant, floating LNG facility or production through other LNG hubs.
Mitsui and Co Ltd Expansion of Onslow Solar Salt	Salt	Immediately southwest of Onslow		Onslow	Increase from 2.5Mt/a to 5 Mt/a	unknown	unknown	35	50 yrs+	Beyond 2013	Study in progress
Total investment / workforce (projects at prefeasibility)						US\$15 b+	2500+	160			

Source: Prospect magazine (April - May 2011), Department of Mines and Petroleum (2011), Minerals and Energy - Major Development Projects, October 2010 listing, Australian Bureau of Agricultural and Resource Economics and Sciences (2010), Investment Monitor, Access Economics (March 2011).

<sup>1</sup> Workforce is the anticipated number of people who will be employed by a project during construction or operational (permanent) phases. These figures may differ to the number at commencement of the project and should be read as indicative. In some cases workforces may be split across various project elements and therefore various locations.

FEED – front end engineering design, Mt/a – mega (10<sup>6</sup>) tonnes per annum, TJ/d – tera (10<sup>12</sup>) joules per day.

Due to the relatively large scale of the operation and the capacity to load 50,000 t class ships, Mitsui and Co., Ltd services customers demanding relatively large quantities of high quality salt. Given Onslow's close proximity to Asian markets and continuing strong demand from Asian industries, demand for Onslow's salt is likely to continue to increase. If the demand outlook justifies the investment, the capacity of Onslow Solar Salt's operations could potentially expand to approximately 5 Mt/a if proposed extensions are developed. In addition to the construction workforce required, this is expected to create 35 new operational jobs.

The global demand outlook for salt is therefore a key factor in supporting employment growth in the town.

## Oil and gas

There is one oil and gas processing project currently operating close to Onslow. The facility is located on Thevenard Island, 22 km northwest of Onslow, and is capable of processing 120,000 barrels of oil and 500,000 cubic metres (m<sup>3</sup>) of gas per day. The facility is operated by a Chevron Texaco/Santos/Exxon Mobil consortium, and commenced production in 1989. The Thevenard Island operations are a hub for six adjacent oil and gas fields (Saladin, Roller, Skate, Yammaderry, Cowle and Crest). Crude oil is processed at the facility and readied for shipment to refineries. The oil is stored in a 1 million barrel storage facility on the island and exported via an offshore tanker mooring.

The Tubridgi Joint Venture commenced production of the onshore Tubridgi gas field in 1991. Conditioned gas from the processing facility was piped 87 kilometres via the Tubridgi pipeline to the Dampier Bunbury Natural Gas Pipeline. Production of gas for on-sale ceased in October 2004, with all production ceasing in August 2005.

The Griffin Joint Venture (BHP Billiton Petroleum, Mobil and Inpex) commenced extraction of oil and gas from the Griffin and Chinook-Scindian offshore fields (62 km north of Onslow) in 1994. Oil and gas from the fields was processed by a floating production, storage and offloading facility. Crude oil was offloaded from the facility to tankers and gas was piped 68 km to the Griffin onshore processing facility, located 30 km south of Onslow on Urala Station. Gas was then piped via the 87 km

Griffin pipeline to the Dampier to Bunbury Natural Gas Pipeline. Production ceased in 2009 due to natural depletion of the resource.

## Ashburton North Strategic Industrial Area (ANSIA)

In December 2008, the State Government announced the establishment of the Ashburton North Strategic Industrial Area, 11 km southwest of Onslow (Map 3). The estate, which covers an area of approximately 8000 ha will support the long-term economic development of the oil and gas sector in the Pilbara. Detailed planning for the estate is under way. It is envisaged that the estate will be developed in two stages:

**Stage 1** encompasses planning for a port precinct (which includes common-user facilities, proponent dedicated areas within a common user coastal area (CUCA) and administration facilities), specific LNG processing sites, an area earmarked for future industrial development, multi-user infrastructure corridors, general industrial lots and temporary workers camps.

The area designated for future industry is proposed to be developed as an industrial estate with potential for future hydrocarbon industrial uses as well as other related industrial uses including downstream gas processing, fertiliser production and other non-LNG based hydrocarbon industries. Potential uses include a urea/ammonia plant, ammonium nitrate plant, methanol plant and utility infrastructure such as power station and water supply facilities. Development is subject to further detailed planning and approvals.

**Stage 2** encompasses the balance of the area. In the short term, it is likely that the stage 2 area will be used to accommodate support industries; however, development of this area for major projects will depend on demand. Planning for the stage 2 area has not been advanced. Development in this area will require expansion of the ANSIA Structure Plan following detailed site investigations to determine the suitability of the area.

Following the announcement about establishing the estate, three proponents were granted temporary land allocations to investigate the feasibility of establishing gas processing facilities at the ANSIA (BHP Billiton Petroleum/Apache Northwest for the Macedon project, Chevron Australia for the Wheatstone project and BHP Billiton Petroleum/Exxon Mobil for the Scarborough project).

## Macedon

The Macedon project, to be operated by BHP Billiton Petroleum, will commercialise natural gas from the Macedon gas field, which is located 100 km west of Onslow. The reserve is estimated to contain 1.2 trillion cubic feet (Tcf) of natural gas. Development of the resource was previously not considered viable due to the minimum quality gas specifications required on the Dampier to Bunbury Natural Gas Pipeline, which prevented the supply of Macedon's gas through the pipeline. Legislation introduced in 2009 to widen the specification for gas permitted to access the pipeline has since prompted the development of the resource.

In September 2010, BHP Billiton Petroleum and joint venture partner Apache Northwest approved the US\$1.5 b Macedon domestic gas project making Macedon the first project to be established in the ANSIA. Gas from the facility will be fed via a sales gas pipeline into the Dampier to Bunbury Natural Gas Pipeline to supply the State's domestic gas market. The plant will have a production capacity of approximately 200 million cubic feet of natural gas per day, which is equivalent to about 20 per cent of the State's current usage. Production is anticipated to commence in 2013, and continue for 10-15 years. The project requires a construction workforce of 300 and a permanent operational workforce of 16.

Development of this project will assist with meeting the rising demand for domestic gas and will improve the diversity of domestic gas supply.

The Macedon project is fully committed and construction has commenced. A construction camp will be located at the Macedon site that will be relinquished after the construction period ends. Operational workers will be located in the Onslow townsite.

## Wheatstone

The Wheatstone natural gas field is located approximately 200 km north of Onslow. In March 2008, Chevron Australia announced intentions to develop the Wheatstone field as a greenfield onshore LNG and domestic gas project. Following an initial site investigation process, the ANSIA was identified as the preferred site.

As part of the Wheatstone project Chevron Australia will develop a 25 Mt/a LNG and domestic gas plant complex, together with associated offshore infrastructure. The initial development

is expected to consist of two LNG processing trains, with a combined nominal capacity of 8.9 Mt/a, plus the domestic gas plant. Gas will be sourced from the Wheatstone and Iago gas fields.

In early December 2009, Chevron Australia announced that it had signed a 20-year sales agreement with the Tokyo Electric Power Company for the supply of LNG. Supplying 3.1 Mt/a, the agreement underpins the Wheatstone project. Chevron Australia has also signed initial sales agreements with Kyushu Electric Power Co Inc and the Korea Gas Corporation. Two joint venture participants, Apache Julimar Pty Ltd and KUFPEC Australia (Julimar) Pty Ltd also signed agreements in 2009 to provide third-party gas from their Julimar and Brunello gas fields (165 km north of Onslow) to the Wheatstone project. Gas from these fields will extend the life of the first two Wheatstone LNG trains.

State and Australian Government environmental approvals for a 25Mt/a LNG plant and associated facilities were announced in August and September 2011 (respectively) and a final investment decision for the Wheatstone project was announced by Chevron Australia on 26 September 2011.

With an estimated construction workforce of up to 5000 (peak of 4300 as advised by Chevron Australia, May 2011) and an operational workforce of 300, the project will result in a significant increase in demand for land and housing in Onslow.

## Scarborough

Discovered in 1979, the Scarborough gas field sits in an isolated location, 280 km northwest of Onslow. The reserve is held on a 50/50 basis by BHP Billiton Petroleum and Exxon Mobil. BHP Billiton Petroleum also wholly owns the Thebe reserve, located 31 km from the Scarborough field. Lying in the southern half of the Carnarvon Basin, the Scarborough reserve is estimated to contain 8 Tcf of hydrocarbons, and the Thebe reserve approximately 2-3 Tcf. It is estimated that the reserves could produce 5.8-6.7 Mt of LNG annually. Pre-feasibility work is ongoing. Capital costs to develop the Scarborough-Thebe reserves are estimated at US\$15-20 b.

BHP Billiton Petroleum and Exxon Mobil are considering various development options including a standalone onshore LNG plant at the ANSIA, a floating LNG facility or production through other LNG hubs in the region. It is not considered likely that production

would commence prior to 2020. If the Scarborough project does proceed and is located in the ANSIA, it is likely to be of a similar scale as the Wheatstone project, and will therefore have similar population/employment and infrastructure impacts. In November 2008, Exxon Mobil and BHP Billiton Petroleum were allocated land within the ANSIA for a period of three years to conduct feasibility studies. This land allocation will cease if certain conditions are not met.

It is not possible to comment on the level of certainty associated with the commencement of this project until feasibility studies have been completed. It is unlikely to expect any construction work prior to 2016.

## Gorgon

The Gorgon gas project is being developed by Chevron Australia, Exxon Mobil and Shell based at Barrow Island located 100 km northeast of Onslow. The Gorgon project is expected to result in \$43 b capital expenditure. Based on a 30-year, three train LNG and domestic gas project, peak construction employment throughout Western Australia may result in 10,000 direct and indirect jobs. Construction and commissioning of the trains is expected to be staggered over an 18 month period. The domestic gas pipeline from Barrow Island will connect with the Dampier to Bunbury natural gas pipeline.

Construction and operational workers are based on Barrow Island on a FIFO residential basis. Most servicing occurs from Karratha and Dampier; however, there is potential for Onslow to be a secondary servicing base, particularly for vessels associated with this project.

## 2.3 Tourism

Onslow is a popular holiday destination, attracting visitors travelling along the North West Coastal Highway (and Warlu Way) as well as residents of the region's inland mining towns. A small but consistent number of retirees stay in Onslow for extended periods during winter, enjoying the town's relaxed and quiet lifestyle. The town offers a number of tourist activities including fishing, charter and eco-tours to the nearby Mackerel and Montebello Islands (operating from Beadon Creek Harbour); historical sites such as the Old Onslow townsite; tours of the Onslow Salt facility; and natural attractions such as the Ashburton

River, termite mounds and Sunrise, Sunset and Four Mile beaches.

While operation and development of mineral and energy projects remains the main economic driver for the Shire of Ashburton, development of the tourism industry offers an opportunity to diversify the area's economic base, and generate local employment for people outside of the resource industry.

According to Tourism WA's *Overnight Visitor Fact Sheet* for the Shire of Ashburton, on average 73,000 visitors came to the Shire of Ashburton each year over 2008, 2009 and 2010. Business was the main purpose of visit for domestic visitors at 49 per cent (followed by holiday or leisure at 32 per cent) with holiday/leisure being the main purpose of visit for international visitors at 83 per cent. The annual average room occupancy rate for hotels, motels and serviced apartments with 15 or more rooms for 2008, 2009 and 2010 was in excess of 55.3 per cent, peaking at 61.1 per cent in 2010. On average, domestic overnight and international visitors to the northwest tourism region spent \$1017 and \$1505 per trip (respectively) for the year ending June 2010.

Research by the Tourism Forecasting Committee shows that between 2000 and 2009 the annual growth rate for visitor nights in regional Western Australia (excluding Perth) was -1.2 per cent. Total visitor nights in regional WA are predicted to increase by 0.4 per cent each year between 2009 and 2020, which is lower than that forecast for Perth, at 2.6 per cent. Domestic visitor nights in regional Western Australia are forecast to fall by 0.5 per cent annually over the period 2009 to 2020.

Development of the tourism industry in Western Australia relies on the provision of appropriate infrastructure, which services the needs of tourists and encourages investment by the private sector. Tourism WA facilitates infrastructure development through its report *Tourism Development Priorities*, which identify key infrastructure projects for tourism development across the State.

Tourism WA also monitors private and public sector tourism development activity across the State, maintaining a comprehensive database that tracks the progress of tourism accommodation projects. A summary is published annually in the *Register of Significant Tourist Accommodation Development*. At June 2010, the register reported six projects at the planning stage in the North West tourism region, with an estimated cost of \$155 m.



With the town about to undergo major investment linked to resource and energy projects, tourism in this setting may need to compete for limited accommodation and other local services. In the short term, it is recognised that tourism in Onslow may be difficult to develop as major resource projects overshadow typical visitor activities. These issues are discussed in the Shire of Ashburton's *Tourism Destination Development Strategy*, which was adopted by council in March 2011.

The Shire is currently working on a revitalisation plan for the town centre and is also considering a range of projects such as a potential marina and upgrade to the Onslow airport, which may offer opportunities for increased tourism.

## 2.4 Other industries

### Commercial fishing

Beadon Creek Harbour is the main harbour for fishing vessels and commercial fishing operations. A small prawn fishery (Onslow Prawn Managed Fishery) operates in waters around Onslow, harvesting mainly tiger prawns from inshore areas, with a lesser catch of king, banana and endeavour prawns further offshore. The fishery was gazetted in 1991. The commercial production from this fishery in 2009 was 57 tonnes, which is lower than the target catch range at 60-180 tonnes. The annual catch from this fishery is affected by environmental factors such as water temperatures,

cyclones and rainfall, which can also vary the composition of the catch. The fishery makes a considerable economic contribution to Onslow with an estimated value (to fishers) of the Onslow Prawn Managed Fishery of \$0.6 m in 2009.

The number of fishing vessels operating from Beadon Creek Harbour has declined over recent years, with only four vessels currently operating. Ashburton Fisheries undertake commercial fishing and processing in Onslow providing employment to a small number of people.

### Pastoral

A number of pastoral stations operate around the Onslow area, including Minderoo (sheep and cattle), Peedamulla (cattle) and Urala (sheep and cattle). These stations use Onslow as a service centre.

### Other potential new industries

There is a recent start up business in Karratha/Dampier involving algae growing which yields a number of crops. The algae are grown in shallow salt water ponds and rely on heat and the trickle-through of carbon dioxide (CO<sub>2</sub>). From that, pharmaceuticals, nutritional supplements and oil for fuel are produced. With a future gas plant producing CO<sub>2</sub> emissions that could be potentially piped to low lying salt pond areas, conditions may be suitable in Onslow for similar production; however, this would be subject to further investigation, planning, and approvals.

### Economic outlook and business investment - for more information see the following links:

Access Economics: [www.accesseconomics.com.au](http://www.accesseconomics.com.au) see Investment Monitor

Australian Bureau of Agricultural and Resource Economics and Sciences: [www.abare-brs.gov.au](http://www.abare-brs.gov.au) see Australian Commodities Report, Australian Mineral Statistics, Minerals and Energy – Major Development Projects and Economic Outlook

Australian Bureau of Statistics: [www.abs.gov.au](http://www.abs.gov.au) see Catalogue 8412.0 - Mineral and Petroleum Exploration, Australia

Catalogue 8635.5.55.001 - Tourist Accommodation, Small Area Data, Western Australia

Department of Mines and Petroleum: [www.dmp.wa.gov.au](http://www.dmp.wa.gov.au) see Prospect magazine, Western Australian Mineral and Petroleum Statistics Digest

Department of Treasury and Finance: [www.dtf.wa.gov.au](http://www.dtf.wa.gov.au) see Treasury - Economic Indicators and State Budget

Pilbara Development Commission: [www.pdc.wa.gov.au](http://www.pdc.wa.gov.au) see Pilbara Projects Update

Tourism WA: [www.tourism.wa.gov.au](http://www.tourism.wa.gov.au) see Research and Statistics

## 3 Population and employment profile

### Key points

- According to ABS data, as at 30 June 2010, the Shire of Ashburton had an estimated resident population of 6730 persons. This grew at 0.8 per cent per annum between 2005 and 2010.
- Onslow accounted for just under 10 per cent of the Shire's population in the 2006 Census with 576 persons stating Onslow was their place of usual residence. According to Shire of Ashburton estimates, Onslow currently has a resident population of approximately 700. There are no other formal estimates of population available for Onslow.
- The town accommodates a fluctuating number of short-term contract workers and is also impacted by a large number of visitors during peak tourism season, exacerbating the difficulty in determining the total service population which is critical for service provision.
- Approximately one third of Onslow's residents are Indigenous. The nomadic nature of this population group may have contributed to the differential counts in the population of Onslow.
- In comparison to other Pilbara towns, Onslow has a larger proportion of its resident population aged 65 and over.
- Traditionally the average wages in Onslow have been lower than Western Australian average wages.
- The Department of Education, Employment and Workplace Relations reported that the Shire of Ashburton had an estimated labour force of 4476 persons as at June 2011, of which a very low proportion (85 persons or 1.9 per cent) were registered as unemployed.
- Data from the 2006 Census indicated a labour force of 298 persons in Onslow. The main industries providing employment in Onslow were mining, construction and public administration and safety.

- Care should be taken when using shire-based population and employment data as trends for the Shire may not be indicative of trends experienced in Onslow.

### 3.1 Estimated resident population

Population data published by the Australian Bureau of Statistics (ABS) for the Shire of Ashburton are detailed in Table 3 and Table 4. Data for the estimated resident population (ERP) and place of usual residence are shown. Further information on these different count methods is detailed in the glossary of this document.

The Shire of Ashburton had an estimated resident population of 6730 persons in 2010 (Table 3). Over the period 2005 to 2010, the Shire experienced an annual average growth rate of 0.8 per cent, which was lower than that of the State, at 2.6 per cent (for the same period). The growth rate over the period 2009 to 2010 was estimated at 0.9 per cent. Based on estimates of the resident population by census collection district, Onslow had a resident population of 667 persons at 30 June 2009.

Onslow accounted for just under 10 per cent (576 persons) of the Shire's population in the 2006 Census (place of usual residence). However, the number of persons present in Onslow on Census night 2006 (place of enumeration) was larger, with 934 persons recorded. This figure includes residents, tourists and visitors and provides a better indication of the total service population.

In the 2006 Census, Western Australia recorded a net undercount of 3.2 per cent, higher than the national average of 2.7 per cent. While regional figures are not available, it is understood that the undercount is more significant where higher population of Indigenous communities and young males (aged 20 to 29) reside. After adjustments to accommodate the undercount and discrepancies associated with multiple places of residence, the estimated resident population was increased (intra-censal update). These figures reflect only the resident population, not the total service population (resident plus short-term workers and visitors). Current Census methods do not adequately identify FIFO and construction workforces as many workers residing in mining towns may report that they usually live elsewhere, such as in a capital city, and are therefore classified as visitors on the basis of their response to the Census.

The ABS reports that the increasing mobility of Australians and use of population numbers for the allocation of resources has created a growing demand for estimates of service populations within local government boundaries. Directions for ABS population estimates in the future will be influenced by the need for service population estimates and their application in matters related to decision making and policy, and program formulation and monitoring. The ABS paper *Population Concepts* (Catalogue 3107.0.55.006) discusses various service population definitions and associated measurement issues.

### 3.2 Population structure

The age sex profile (Census 2006) for the settlement of Onslow and the Shire of Ashburton (Figure 2 and Figure 3 respectively) highlights the significant differences of the age spread of residents when compared with that of the State (Figure 4). This is reported by calculating the proportion of the total population within each specified age range. In general, Onslow's population is made up of a high proportion of working aged people and retirees and a significant number of very young children, with only a small proportion of youths aged 10 to 19 recorded. Care

should be taken when using these figures given Onslow's low population base and known issues regarding the collection of the 2006 Census.

At the 2006 Census, a significantly larger proportion of the Shire of Ashburton's population was aged between 20 and 44 (46.4 per cent) when compared with that of the State (35.4 per cent). An even larger proportion was recorded for the settlement of Onslow, at 57.7 per cent. The shire also had a large proportion of the population aged between zero and nine (22 per cent), compared with that of the State (13.1 per cent). Fewer children of school age (5-14 years) and high school/college age (15-24 years) were recorded in Onslow (21.9 per cent in total) when compared with the Shire of Ashburton (27 per cent) and the State (28 per cent).

Interestingly, the proportion of the Shire's population at retirement age or older (65 and over) was only 1.8 per cent, significantly lower than that of the State, at 12 per cent. However, nine per cent of Onslow's residents were aged 65 years or older at the 2006 Census, which is significantly higher than many other Pilbara towns. A higher proportion of the population in the Shire was male (56.5 per cent), compared with 49.8 per cent in the State.

**Table 3: Estimated resident population 2002 to 2010 – Shire of Ashburton**

Local government	2002 no.	2003 no.	2004 no.	2005 no.	2006 no.	2007 no.	2008 no. (r)	2009 no. (r)	2010 no. (p)	2005- 2010 (p)a	2009(r)-2010(p)	
											no.	per cent
Shire of Ashburton	5914	5986	6288	6470	6561	6550	6622	6672	6730	0.8	58	0.9

Source: Catalogue 3218.0 Regional Population Growth, Australian Bureau of Statistics (2011)  
a average annual growth rate  
p preliminary  
r revised

**Table 4: Census 2006 locality populations – Shire of Ashburton**

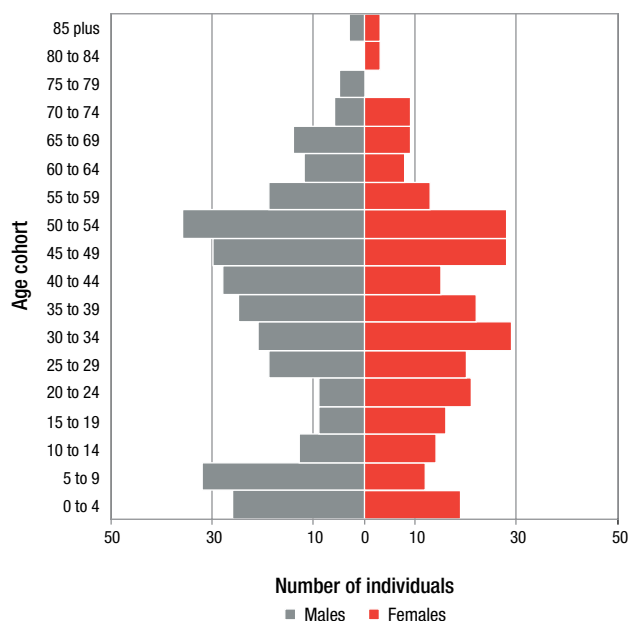
Locality	Number of persons	Per cent of local government
Onslow	576	9.5
Pannawonica	686	11.3
Paraburdoo	1607	26.4
Tom Price	2721	44.8

Source: Catalogue 2068.0 Census Tables, Australian Bureau of Statistics (2007)  
Data based on place of usual residence.

The median age of the Onslow population at the 2006 Census was 37, which is comparable to that recorded for the State at 36 years. The median age for the Pilbara region was 31 years.

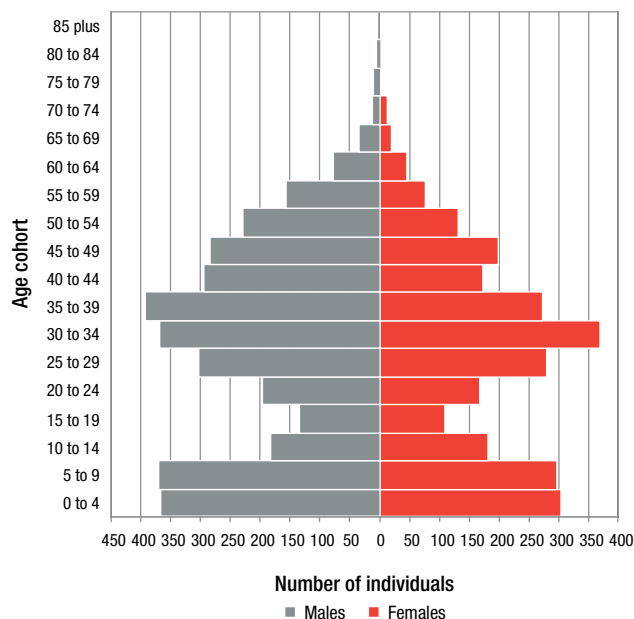
Approximately one-third of Onslow's usually resident population at the 2006 Census reported that they were Indigenous.

**Figure 2: Census 2006 age sex profile – Onslow**



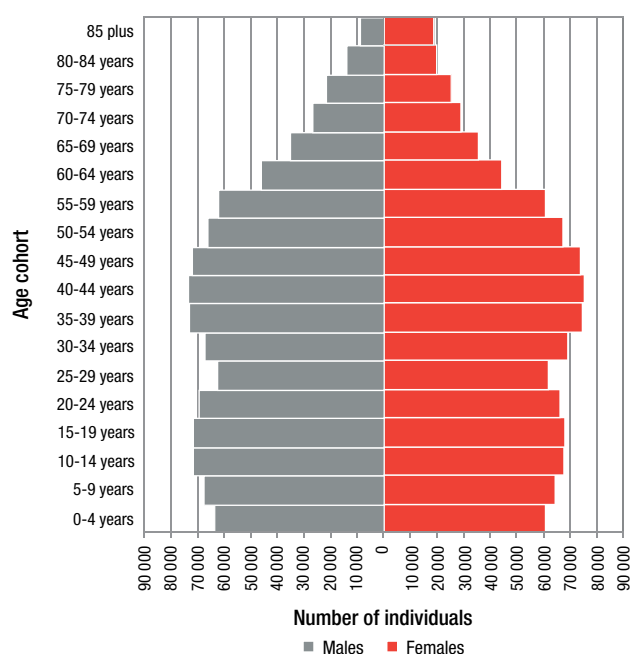
Source: Catalogue 2068.0 Census Tables – Age by sex, Australian Bureau of Statistics (2007)

**Figure 3: Census 2006 age sex profile – Shire of Ashburton**



Source: Catalogue 2068.0 Census Tables – Age by sex, Australian Bureau of Statistics (2007)

**Figure 4: Census 2006 age sex profile – Western Australia**



Source: Catalogue 2068.0 Census Tables – Age by sex, Australian Bureau of Statistics (2007)

### 3.3 Population stability

Onslow has a relatively stable population with a low resident churn factor when compared with other settlements in the Pilbara. At the 2006 Census, Onslow recorded a similar proportion to the State of usual residents who resided at their current address one and five years ago. Approximately 73 per cent and 42 per cent of Onslow residents lived at their current address one and five years ago respectively, compared with 75 per cent and 48 per

cent for the State (Figure 5 and Figure 6). A number of residents resided at different addresses within the same statistical local area or elsewhere within the State. In terms of Onslow residents who previously resided in other states (5 years ago), the largest number were from Queensland and South Australia (both at 1.7 per cent).

Figure 5: Census 2006 place of usual residence 1 and 5 years ago – Onslow

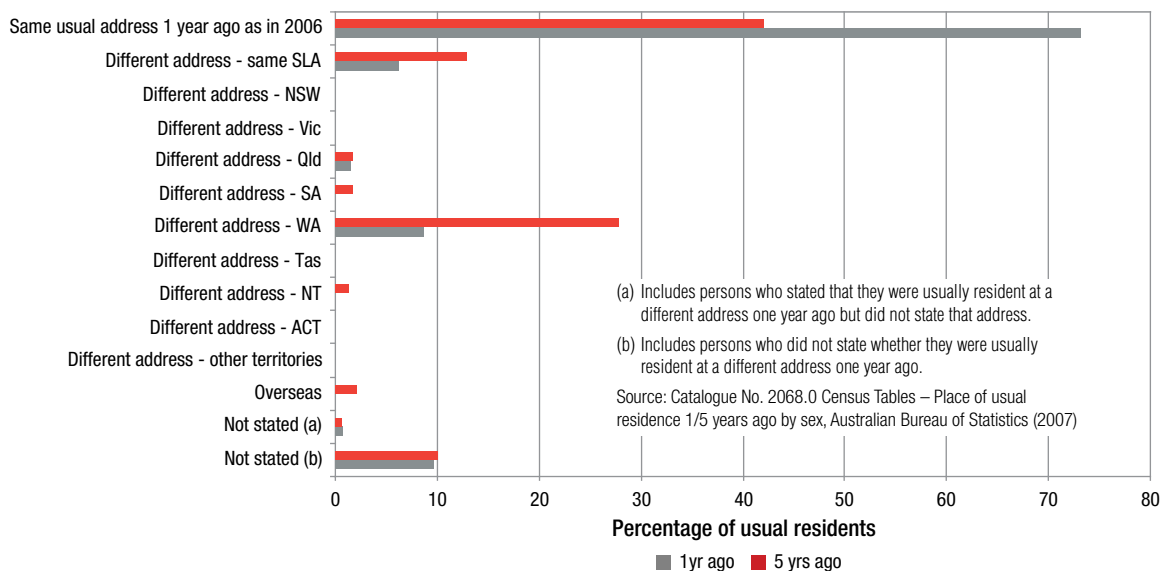
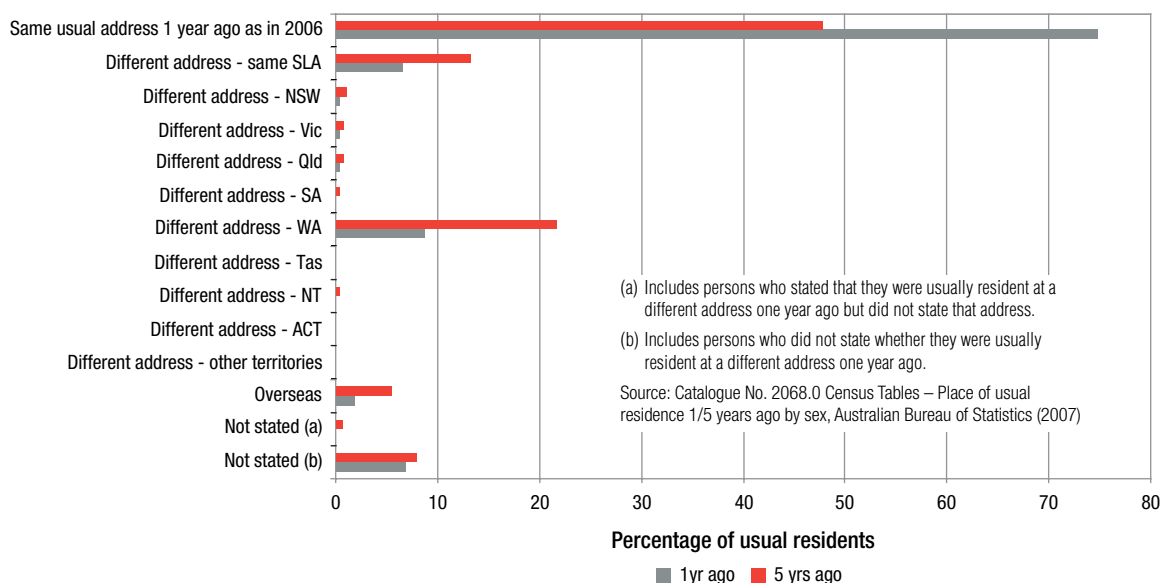


Figure 6: Census 2006 place of usual residence 1 and 5 years ago – Western Australia



### 3.4 Household formation

In terms of household structure, the majority (65.5 per cent) of Onslow's occupied private dwellings recorded at the 2006 Census were family households (Table 5). Lone person households accounted for 30.6 per cent of occupied private dwellings, and group households 3.9 per cent. A group household is defined as consisting of two or more unrelated people where all persons are aged 15 years or over. Evidence suggests that the proportion of group households reported in the 2006 Census may have been understated in the Pilbara region.

Based on data from the 2006 Census, the average household size in Onslow was 2.3 and the average number of persons per bedroom was 1.2. This compares with the Western Australian average household size of 2.5 and the average number of persons per bedroom of 1.1.

### 3.5 Industry of employment

In the 2006 Census, the most common industries of employment for persons aged 15 years and over usually resident in Onslow were mining (18.8 per cent), construction (10 per cent), public administration and safety (10 per cent) and health care and social assistance (9.6 per cent). This is shown in Figure 7.

Major employers within the town are Onslow Salt and businesses servicing offshore oil and gas activities, commercial fishing and charter operations. The tourism sector also provides additional employment for the resident population.

Based on information contained in the Department of Mines and Petroleum publication *Western Australian Mineral and Petroleum Statistical Digest 2009-10* there was an average of 161 and 143 people employed by Onslow Solar Salt operations in 2008 and 2009 respectively. These figures compare with total employment of 867 and 778 over the same periods for all salt employment within the State.

The Onslow Prawn Managed Fishery operates in waters around Onslow and is divided into three fishing zones. The fishery harvests mainly tiger prawns from inshore areas, with a lesser catch of king, banana and endeavour prawns further offshore. The fishery makes a considerable economic contribution to Onslow – the estimated value (to fishers) of the Onslow Prawn Managed Fishery in 2009 was \$0.6 m. The number of fishing vessels

**Table 5: Census 2006 household types – Onslow**

Household type	Family household type	Number of households	% of total households
Family households	Couple families with children	45	19.4
	Couple families without children	78	33.6
	One parent families	26	11.2
	Other families	3	1.3
	<b>Total family households</b>	<b>152</b>	<b>65.5</b>
Lone person households		71	30.6
Group households		9	3.9
<b>Total households<sup>1</sup></b>		<b>232</b>	<b>100.0</b>

Source: Catalogue 2001.0 Basic Community Profile – Onslow urban centre/locality, Australian Bureau of Statistics (2008)

Census 2006 QuickStats, Australian Bureau of Statistics (2007)

<sup>1</sup> Total of family households plus lone person and group households.

operating from Beadon Creek Harbour has declined over recent years, with only four vessels currently operating.

### 3.6 Income distribution

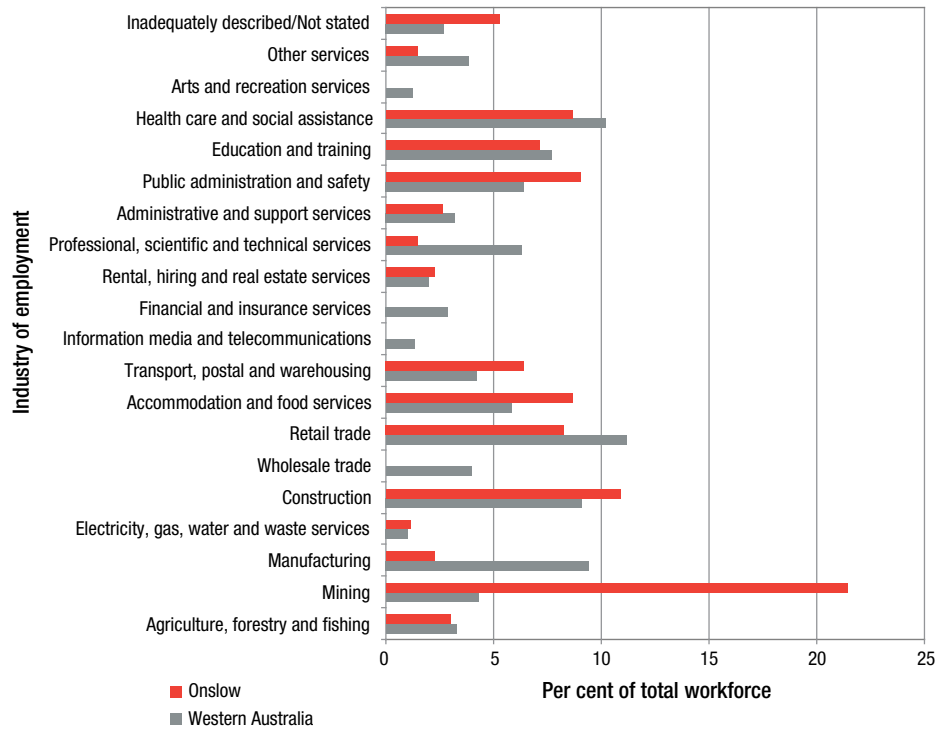
Compared with Western Australia as a whole, Onslow has a higher proportion of individuals and households earning a relatively low weekly income, which is in direct contrast to data for the Pilbara region.

Based on data collected in the 2006 Census, the median weekly individual income for persons aged 15 years and over who were usual residents in Onslow, was \$428. This is lower than the median weekly individual income for Western Australia at \$500 and for the Pilbara (\$887). The median weekly household income in Onslow was \$961, compared with \$1066 in Western Australia and \$1969 for the Pilbara. In 2006, approximately 22 per cent of Census respondents in Onslow (based on place of usual residence) reported a gross individual weekly income of above \$1000. This is comparable to the gross individual weekly income for all Western Australian residents (at 20 per cent), but is less than that recorded for the Pilbara region at 36 per cent.

Income distribution (Census 2006) for Onslow, Pilbara and Western Australian residents is shown in Figure 8.

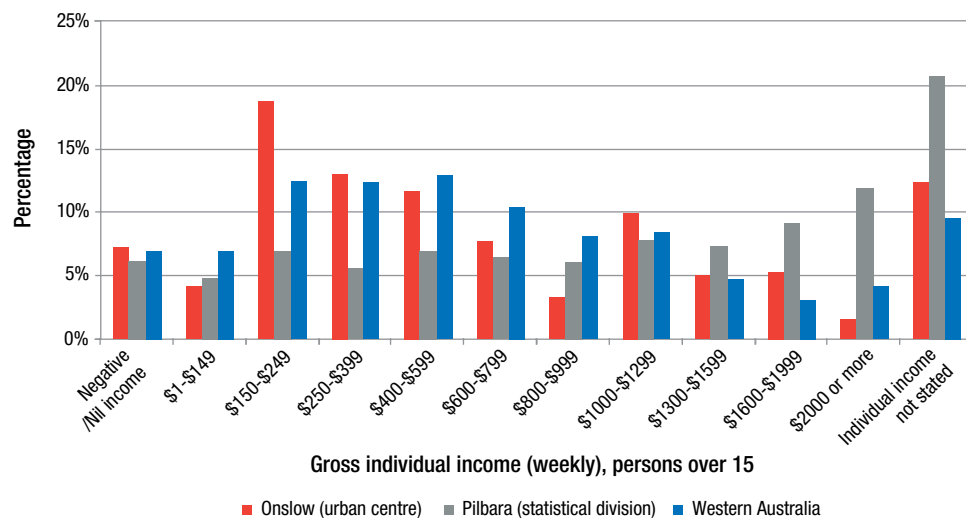


Figure 7: Census 2006 industry of employment – Onslow



Source: Catalogue 2068.0 Census Tables - Industry of employment, Australian Bureau of Statistics (2007)

Figure 8: Census 2006 income distribution – Onslow, Pilbara and Western Australia



Source: Catalogue 2068.0 Census Tables – Gross individual income (weekly) by age by sex, Australian Bureau of Statistics (2007)

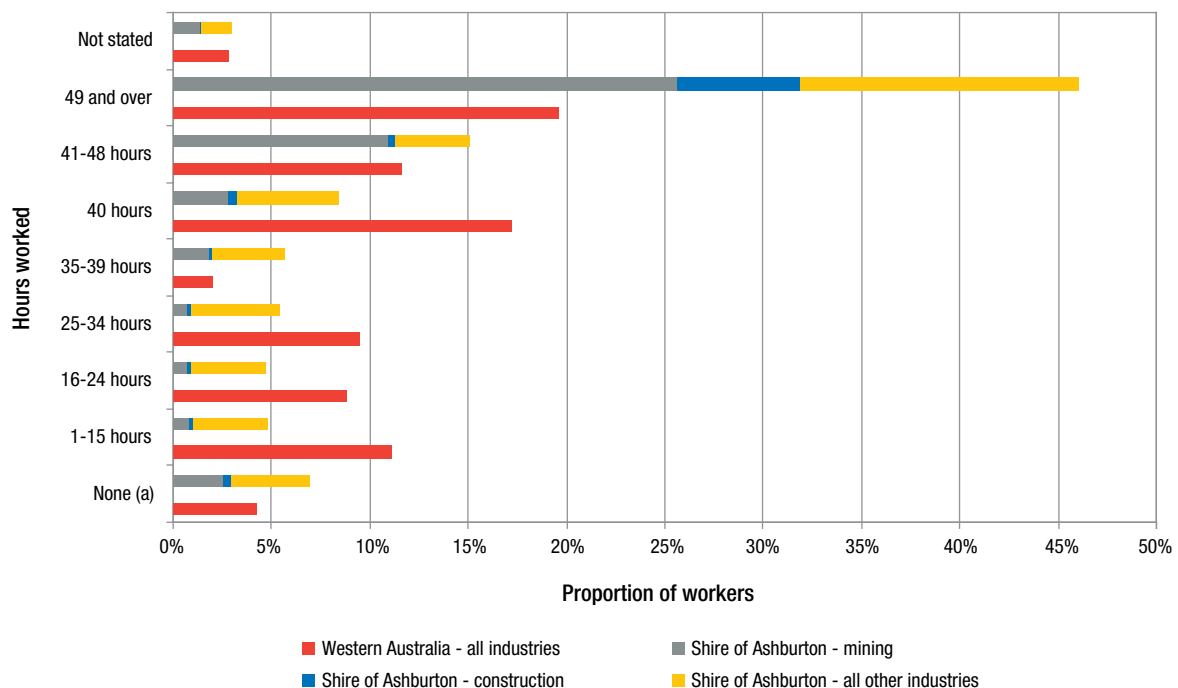
### 3.7 Working patterns

According to the ABS, the median wage in Western Australia grew at an average annual growth rate of 6.4 per cent over the period 2003/04 to 2007/08. Data for the Shire of Ashburton indicate an average growth rate of 5.6 per cent over the same period. The Shire of Ashburton recorded an average and median wage of \$69,352 and \$68,632 respectively in 2007/08, significantly higher than that of the State (\$46,199 and \$37,986 respectively) and the nation. These data may not be indicative or representative of wages growth in Onslow, as each of the major settlements within the Shire may offer differing employment opportunities and wages due to the nature of the local industries.

The pattern of working hours in the Shire of Ashburton shows a high proportion (61 per cent) of employees that worked in excess of 40 hours per week (Figure 9). This compares with 31 per cent of all workers in Western Australia working in excess of 40 hours per week. Approximately 36 per cent of those employed in the Shire of Ashburton who worked more than 40 hours per week were employed in the mining industry.

It is again noted that Onslow's population is only a small proportion of the Shire of Ashburton (approximately 10 per cent) and its economic base and labour force characteristics differ from the other towns within the Shire. Accordingly, these statistics may not be a true representation of the working patterns for the town of Onslow.

Figure 9: Census 2006 working patterns by industry – Shire of Ashburton



Source: Spotlight on the Pilbara, Census of population and housing – Working patterns by hours worked, Australian Bureau of Statistics (2009)

### 3.8 Labour force

The *Small Area Labour Markets June Quarter 2011* report produced by the Department of Education, Employment and Workplace Relations (DEEWR) states that the Shire of Ashburton had a labour force of 4476 in June 2011. DEEWR estimates also indicate a consistently low unemployment rate for the Shire, which was 1.7 per cent with an estimated 77 individuals unemployed for the quarter to June 2011. Note that this datum is for the whole Shire, and may not reflect current labour force trends for the local Onslow area.

At the time of the 2006 Census, Onslow had a total labour force of 298 persons (employed and unemployed persons aged 15 years and over). Of these, 60 per cent worked full time and 17 per cent part time. Approximately nine per cent of the labour force was unemployed, which is significantly higher than that of the State at 3.8 per cent (at the time of the Census). The remaining 13 per cent of the Onslow labour force was either employed but away from work (that is, they did not work any hours in the week prior to Census night), or did not state their working hours.

Population and employment profile – for more information see the following links:

#### Population

Australian Bureau of Statistics: [www.abs.gov.au](http://www.abs.gov.au) see Catalogue 2001.0 - 2006 Census Community Profile Series, Ashburton (local government area)

Catalogue 2001.0 - 2006 Census Community Profile Series, Onslow (urban centre/locality)

Catalogue 2068.0 - 2006 Census Tables

Catalogue 3107.0.55.006 - Information Paper, Population Concepts, Australia

Catalogue 3206.0 - Household and Family Projections, Australia, 2001 to 2026

Catalogue 3218.0 - Regional Population Growth, Australia, 2008-09

#### Employment

Australian Bureau of Statistics: [www.abs.gov.au](http://www.abs.gov.au) see Catalogue 2068.0 - 2006 Census tables: Onslow (urban centre/locality) - Industry of employment by occupation - Onslow (place of usual residence and location on census night)

Catalogue 2068.0 - 2006 Census tables: Onslow (urban centre/locality) - Industry of employment by gross individual income (weekly) (place of usual residence)

Catalogue 5673.0.55.003: Ashburton (local government area) - Wage and salary earner statistics for small areas, Time series, 2003-04 to 2007-08

Department of Education, Employment and Workplace Relations: [www.deewr.gov.au](http://www.deewr.gov.au) see Small Area Labour Markets - Australia

Department of Mines and Petroleum: [www.dmp.wa.gov.au](http://www.dmp.wa.gov.au) see Western Australian Mineral and Petroleum Statistical Digest

## 4 Population and employment projections

### Key points

- Without the development of resource projects in the area, Onslow would likely experience only limited growth of the resident population.
- The town's other industry sectors of commercial fishing and tourism are unlikely to experience any significant employment growth in the short to medium term.
- Business investment by resource companies could result in a short to medium term impact of construction workers in Onslow and a longer term impact of operational employees. This would increase employment opportunities for local residents as well as wages.
- Various forecasts of resource-related employment have been prepared for Onslow including estimates prepared by the Shire of Ashburton (for the *Onslow Townsite Strategy*), the Pilbara Industry's Community Council, and more recently by State Government agencies (Department of State Development (DSD), Department of Planning (DoP) and LandCorp).
- The forecasts make various assumptions regarding consequential and indirect workforce multipliers, single/family status of workers and the FIFO and resident workforce components.
- Employment/population forecasts prepared by State Government agencies indicate some population growth between 2011 and 2016 before a significant step change in population in 2017 (total population of 2201) and 2022 (total population of 3756) as a result of LNG projects entering the operational phase. Construction workforces based at the Ashburton North Strategic Industrial Area could reach around 6500 persons (may be higher or lower based on project timing) at any one time.
- DSD is currently leading State Government negotiations on the development of industry at the ANSIA and infrastructure requirements for the town, using a conservative base estimate of 1500 additional residents in Onslow by 2017 for forward planning.

- There are difficulties in forecasting the impacts of future projects due to the changeable and confidential nature of employment estimates by resource companies.
- The use of inconsistent employment/population figures by Government agencies has implications for land development and services planning. State Government agencies are currently using the employment/population forecasts detailed in section 4.1 of this document for forward planning.
- There is no single comprehensive database currently available to source resource related employment information (especially for projects at earlier or pre-feasibility stages of development).
- WAPC projections (published in 2005) estimate that the Shire of Ashburton's resident population will remain stable over the period 2011 to 2021. Revised projections are due to be released later in 2011.
- The population, land and housing impacts resulting from these projects are heavily influenced by business and policy decisions regarding the mix of resident versus FIFO workers.

### Actions and priorities

- Establishment of a single comprehensive database to source resource related employment information (especially for projects at earlier or pre-feasibility stages of development).

*The employment information contained in this document reflects the proponents' intentions at the time of writing. There is potential for data to change with greater proponent clarity.*

Historic resident population data for the Shire of Ashburton indicate a relatively low rate of residential population growth over recent years, recording an average annual growth rate of 0.8 per cent over the period 2005 to 2010. While data available specifically for the townsite of Onslow is limited, anecdotal evidence suggests that the town's resident population has fluctuated over time, experiencing periods of high growth and decline, but remaining relatively stable over recent years.

While population projections are available for the resident population at local government level, these do not take into account transient workers associated with the development of major resource projects (that is construction and short-term contract workers). Many Pilbara towns accommodate a large number of transient workers (including FIFO) who are not consistently included when estimating resident population. These workers can account for a significant portion of the service population, adding up to an additional 25 per cent to the resident population. Estimating the size of this workforce is critical in order to plan for services demand in both towns and the region. The number of construction and/or short-term contract workers being accommodated in Onslow fluctuates; however, was estimated at 150-200 persons in the Shire of Ashburton's *Onslow Townsite Strategy Background Report*.

Various sets of employment/population forecasts are presented in this report, including those prepared by State Government agencies (DSD, DoP and LandCorp), Pilbara Industry's Community Council and those prepared as part of the *Onslow Townsite Strategy*. These datasets comprise the best information currently available regarding the anticipated employment and population impacts resulting from the development of resource projects in Onslow. Care should be taken when using these data, given the different methodologies and assumptions used in generating the data, the use and interpretation of which is complex. Onslow's low population base and relative isolation should also be considered.

It should be noted that DSD, currently leading State Government negotiations on the development of industry at the ANSIA and infrastructure requirements for the town, is using a conservative base estimate of 1500 *additional* residents in Onslow by 2017 for forward planning.

## 4.1 Employment forecasts – State Government

State Government agencies, including DSD, DoP and LandCorp, have undertaken employment scenario modelling for Onslow to consider the direct and indirect employment and population impacts associated with potential resource projects. The modelling is not based on historical trends and observations and should not be used as a formal projection, but rather as a forecast or estimation of the potential impacts these projects may have on the locality of Onslow. The modelling is based on a series of assumptions regarding the number of workers in various phases of the project (construction and operational), proportion of FIFO versus locally based workers, family size and indirect and consequential employment multipliers. These assumptions are detailed further in this section. The forecasts include the potential employment impacts of the following projects:

- Macedon project - BHP Billiton Petroleum (domestic gas)
- Wheatstone project - Chevron Australia (domestic gas and LNG processing)
- Expansion of Onslow Salt operations
- Second LNG facility (equivalent in size to the Wheatstone project)
- Future industry area (ammonium nitrate, ammonia/urea and methanol plants)

The projects included in these forecasts have varying degrees of certainty, with the Macedon and Wheatstone projects being the only fully committed projects at this stage. As such, these forecasts are likely to change as proponent's intentions become more clear.

As noted, the forecasts are based on various assumptions and include the use of employment multipliers. The use of local employment multipliers for resource industry projects needs to be treated with caution. A true local employment multiplier relies on an employee spending enough of their income to support other businesses and employees in the local economy. Even with the high incomes of resource workers, it is difficult for a single employee to spend enough of their gross income in the local economy to fully support the wages of additional workers. Instead, the multiplier benefits of resource projects rely primarily on the contracting practices of the resource company itself and whether it buys goods and services locally, or whether it sources them from other locations.

As there is currently no consistent, endorsed set of indirect or consequential multipliers in Western Australia, this employment modelling has used a number of assumptions based on previous investigations undertaken. These include:

- *Aspects of Regional Economic Analysis*, University of Western Australia (2003) – this report suggests that type two multipliers for the Pilbara may lie between 1.5-2.7.
- *Planning for resources growth in the Pilbara: revised employment and population projections to 2020*, Pilbara Industry's Community Council (2010) uses the following indirect employment multipliers:
  - companies who don't report contractor workers - 1
  - oil and gas companies who don't report contractor workers - 0.75
  - construction - 0.2
  - mining companies who report contractor workers - 0.75.
- *Developing a Growth Outlook for WA's Minerals & Energy Industry Outlook and Implications*, Chamber of Minerals and Energy (WA) (2008) uses indirect labour multipliers ranging from 0.6-1.32.
- *Onslow Strategic Industrial Area Expansion Study*, Department of Industry and Resources (2005) uses indirect employment multipliers ranging from 0.25-0.30 of the total workforce and consequential employment multipliers of 0.25-0.30 of the total population.
- *Mid-West Infrastructure Analysis*, Western Australian Planning Commission (2008) uses a indirect and consequential employment multiplier of 0.3 of the total locally based workforce.
- *Ashburton North Strategic Industrial Area Social Impact Statement*, Chevron Australia (2010) uses a family multiplier of 3.3 for locally based operational workers.

It is important to note that there is no way to accurately determine/quantify actual multipliers; however, it is essential that a well considered allowance is made for this element of growth as this often-hidden demand can have a major impact on a town's future requirements and growth. Discussions with proponents and agencies were held to refine possible multipliers for the purposes

of this modelling exercise. This resulted in assumptions for indirect employment of 0.30 of total workforce and consequential employment between 0.20-0.30 of total population.

The employment/population forecast data presented in this document have been reported both on a project by project basis, and on a location basis (that is ANSIA/townsite based), and includes an estimate of the total service population over time.

Table 6 and Table 7 detail the employment/population impacts of each of the projects, grouped by actual workers and ultimate multiplied population, including indirect and consequential employment. This has also been broken down by family/single status – a 100 per cent family ratio has been assumed for resident operational workers and a 100 per cent singles ratio for FIFO operational workers. A 70/30 family/singles ratio has been allocated to non-specific contract workers, indirect and consequential workers. Given the skills shortage forecast for the State, and Onslow's relative isolation, it may be difficult to attract such a high proportion of workers with families relative to single workers. The ratio will ultimately depend on the availability of skilled workers, the FIFO policies of companies, incentives offered by companies for families to relocate to Onslow, availability of housing and accommodation, and the level of services being offered in the town.

The projects listed in Table 6 and Table 7 have been identified as the projects most likely to proceed prior to 2017 and beyond 2017. It should be noted; however, that establishment of the ANSIA may result in other proponents expressing interest in developing projects in the area. Constant monitoring will be required to ensure the State Government's response is accurate and timely.

Data in Table 6 and Table 7 indicate a potential large employment/population impact resulting from the proposed LNG projects (Wheatstone and potential second LNG project), which have large construction and operational workforces relative to the domestic gas and downstream industries identified. It is assumed that significant indirect and consequential employment will be generated from these projects, both during the construction (non-specific contractors) and operations phase. It is assumed that only the construction workforce and FIFO component of the operations workforce (75 per cent) will operate on a FIFO basis. The remainder of the employees are assumed to be locally based.



Table 6: Employment/population breakdown by project<sup>1</sup> – to 2017

Project	Workforce type	Phase	Workforce sub-type <sup>2</sup>	Estimated workers <sup>3</sup>	Single workers <sup>4</sup>	Workers with families <sup>4</sup>	Depen-dents <sup>4</sup>	Total population impact <sup>5</sup>
Macedon	Project	Construction	Non-specific contractors	18	6	13	19	38
			Construction	300	300	-	-	300
	Indirect	Operations	Resident operations workers	4	0	4	10	14
			FIFO operations workers	12	12	-	-	12
			Indirect resident workers	1	1	1	2	4
			Indirect FIFO workers	4	2	3	4	9
			Consequential resident workers	5	2	4	6	12
			Consequential FIFO workers	4	2	3	5	10
Wheatstone	Project	Construction	Non-specific contractors	60	18	42	63	123
			Construction	3000 -5000	3000 -5000	-	-	3000 -5000
	Indirect	Operations	Resident operations workers	75	0	75	173	248
			FIFO operations workers	225	225	-	-	225
			Indirect resident workers	23	7	16	24	47
			Indirect FIFO workers	68	21	48	71	140
			Consequential resident workers	89	27	62	93	182
			Consequential FIFO workers	73	22	51	77	150
Onslow Salt	Project	Construction	Non-specific contractors	-	-	-	-	-
			Construction	-	-	-	-	-
	Indirect	Operations	Resident operations workers	35	0	35	81	116
			FIFO operations workers	-	-	-	-	-
			Indirect resident workers	11	4	8	12	24
			Indirect FIFO workers	-	-	-	-	-
			Consequential resident workers	42	13	30	44	87
			Consequential FIFO workers	-	-	-	-	-

Source: Analysis based on data supplied by the Department of State Development, Department of Planning and LandCorp (2011)

<sup>1</sup> The data contained in table represent forecast employment/population for specific projects (assumed to be the projects most likely to proceed prior to 2017). Changes to project timing will impact the accuracy of these tables.

<sup>2</sup> Definitions for the variables listed under each column are outlined in the 'Summary of Definitions and Assumptions' (see end of section 4.1). Indirect FIFO workers and consequential FIFO workers relate to indirect and consequential employment impact resulting from the FIFO operations workers. These indirect and consequential workers are assumed to be locally based and not FIFO (see Appendix A).

<sup>3</sup> Total estimated project, indirect and consequential workers associated with each project. The family/single ratio has not been applied.

<sup>4</sup> Actual workers broken down into single, workers with families and dependants. Numbers have been rounded up so may not equate to the total estimated workers. A 70/30 family/singles ratio is assumed for non-specific contractors, indirect and consequential workers. Resident operational workers are subject to a 100 per cent family ratio and FIFO operations workers a 100 per cent singles ratio.

<sup>5</sup> Equates to single workers + workers with families + dependants.

**Table 7: Employment/population breakdown by project<sup>1</sup> – beyond 2017**

Project	Workforce type	Phase	Workforce sub-type <sup>2</sup>	Estimated workers <sup>3</sup>	Single workers <sup>4</sup>	Workers with families <sup>4</sup>	Depen- dents <sup>4</sup>	Total population impact <sup>5</sup>	
Second LNG	Project	Construction	Non-specific contractors	60	18	42	63	123	
			Construction	3000 -5000	3000 -5000	-	-	3000 -5000	
		Indirect	Operations	Resident operations workers	75	0	75	173	248
				FIFO operations workers	225	225	-	-	225
	Indirect resident workers			23	7	16	24	47	
	Indirect FIFO workers			68	21	48	71	140	
	Consequential resident workers			89	27	62	93	182	
	Consequential FIFO workers			73	22	51	77	150	
Ammonia/Urea	Project	Construction	Non-specific contractors	25	8	18	27	53	
			Construction	500	500	-	-	500	
		Indirect	Operations	Resident operations workers	20	0	20	46	66
				FIFO operations workers	60	60	-	-	60
	Indirect resident workers			6	2	5	7	14	
	Indirect FIFO workers			18	6	13	19	38	
	Consequential resident workers			24	8	17	25	50	
	Consequential FIFO workers			20	6	14	21	41	
Ammonium Nitrate	Project	Construction	Non-specific contractors	25	8	18	27	53	
			Construction	500	500	-	-	500	
		Indirect	Operations	Resident operations workers	15	0	15	35	50
				FIFO operations workers	45	45	-	-	45
	Indirect resident workers			5	2	4	5	11	
	Indirect FIFO workers			14	5	10	15	30	
	Consequential resident workers			18	6	13	19	38	
	Consequential FIFO workers			15	5	11	16	32	
Methanol	Project	Construction	Non-specific contractors	25	8	18	27	53	
			Construction	500	500	-	-	500	
		Indirect	Operations	Resident operations workers	13	0	13	29	42
				FIFO operations workers	38	38	-	-	38
	Indirect resident workers			4	2	3	5	10	
	Indirect FIFO workers			12	4	8	12	24	
	Consequential resident workers			15	4	11	17	32	
	Consequential FIFO workers			13	4	9	14	27	

Source: Analysis based on data supplied by the Department of State Development, Department of Planning and LandCorp (2011)

<sup>1</sup> The data contained in table represent forecast employment/population for specific projects (assumed to be the projects most likely to proceed beyond 2017). Changes to project timing will impact the accuracy of these tables.

<sup>2</sup> Definitions for the variables listed under each column are outlined in the 'Summary of Definitions and Assumptions' (see end of section 4.1). Indirect FIFO workers and consequential FIFO workers relate to indirect and consequential employment impact resulting from the FIFO operations workers. These indirect and consequential workers are assumed to be locally based and not FIFO (see Appendix A).

<sup>3</sup> Total estimated project, indirect and consequential workers associated with each project. The family/single ratio has not been applied.

<sup>4</sup> Actual workers broken down into single, workers with families and dependants. Numbers have been rounded up so may not equate to the total estimated workers. A 70/30 family/singles ratio is assumed for non-specific contractors, indirect and consequential workers. Resident operational workers are subject to a 100 per cent family ratio and FIFO operations workers a 100 per cent singles ratio.

<sup>5</sup> Equates to single workers + workers with families + dependants.

This will ultimately depend on the affordability and availability of accommodation for these workers.

A summary of the methodology utilised to derive these forecasts is provided in the summary of definitions and assumptions (see end of section 4.1). Further detail on the single/family component of each of these workforces is detailed in Appendix A (employment/population flowcharts) of this document. The flowcharts represent the potential employment/population impacts of specific projects, and are intended to be both conceptual (by highlighting core modelling steps/stages and data flows) and schematic (by showing the inter-relationship of various population categories to calculate the total impact of proposals).

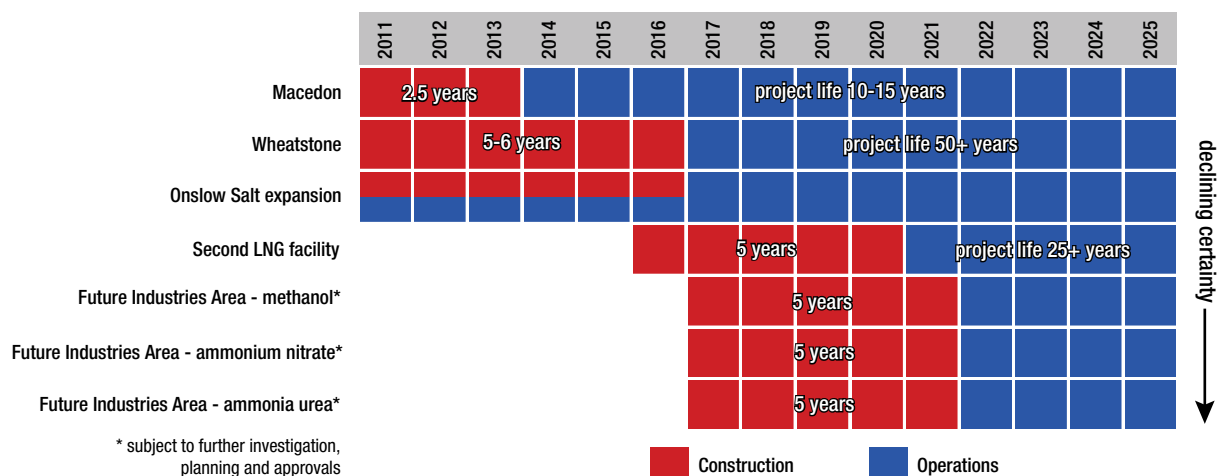
Not all phases of each of these projects will commence at the same time. Construction on the Macedon domestic gas project is due to commence in 2011, with the project expected to enter the operational phase in 2013. Figure 10 details potential staging of each of the projects identified in the employment forecasts.

It should be noted that if the capacity of LNG facilities is expanded over time (as proposed), then a large construction workforce will need to be accommodated in Onslow over a longer period of time.

Data shown in Table 8 detail the potential employment/population impacts of these projects over time. This is broken down by location; that is, workers based at the ANSIA and those based in the Onslow townsite. This total service population information indicates when the potential peak demand for services may occur. A large step change in the town based service population could potentially occur around 2017 if the Wheatstone project proceeds as planned. Between 2011 and 2016 however, some services in Onslow will need to cater for a large service population, even though a large component of this population is a construction workforce which will be based at the ANSIA. Another large step change in the resident population is also likely to occur in 2022 if a second LNG facility is established equivalent in size to the proposed Wheatstone facility. This scenario assumes a five-year construction period commencing in 2017. This is subject to commercial decisions regarding the development of offshore oil and gas reserves; therefore, it is recommended that these forecasts be reviewed on a regular basis. This will ensure an accurate and timely response from government.

Based on these forecasts, the construction employment in Onslow may peak at around 6500 (may be higher or lower based on project timing) in 2019, when the construction phase of multiple projects could potentially overlap. These numbers could potentially increase if expansion of the Wheatstone project also occurs during this time.

**Figure 10: Potential project timing**



Source: Based on data supplied by the Department of State Development, Department of Planning and LandCorp (2011)

Employment/population impacts for the Onslow townsite are expected to remain relatively stable over the period 2017 to 2021 at approximately 1500-1600 additional persons (2200-2300 in total when considering 700 existing residents). This may increase substantially by 2022 if a second LNG facility becomes operational at this time. The total service population is expected to peak in 2019 at approximately 8000 persons - this assumes a large construction workforce located at the ANSIA associated with a second LNG facility and additional downstream industries (such as ammonia/urea, ammonium nitrate and methanol plants). This is shown graphically in Figure 11. The employment/population impacts for the Onslow townsite only are shown in Figure 12.

Dwelling requirements associated with this employment modelling are discussed in sections 5.8 and 6.8 of this document.

Other general qualifications and limitations which should be considered when using this data include:

- The modelling assumes that multipliers are calculated for one worker per family. No consideration has been given to instances where, for example, a husband and wife (plus their dependants) both work in a direct, indirect or consequential capacity located in Onslow.
- The forecasts are not based on historical growth trends due to lack of available data. State averages and indicators from other locations (mostly in the Pilbara) have been utilised where appropriate.
- Given the relative isolation of the Onslow locale (for example, it is a 3-4 hour drive to Karratha, Exmouth or Tom Price), it is assumed that daily drive-in, drive-out options are limited. Furthermore, driving to Onslow will require workers to stay in temporary accommodation for a period of time (thus requiring some form of dwelling).
- The non-specific contractor workforce is an estimate of likely workers required to establish supporting/servicing industries. The model assumes these services will be utilised in a manner that ensures viability of respective businesses. For example, that resource companies will interact with local services.
- Indirect and consequential workforces are considered most likely to live in Onslow on a permanent basis given the relative isolation of the town and associated travel expenses. Unlike company employees, these workers are unlikely to receive living allowances.
- Modelling the impact of operational workers is based on a multiplier of 3.3 persons per worker. Using this multiplier for all projects will ensure ease of comparison. A multiplier of 2.5 persons per worker has been used to calculate impacts resulting from non-specific contractors, indirect and consequential workers. This figure is consistent with the State average for household size.
- The application of multipliers to derive direct, indirect and consequential populations, while based on previous examples, can only be used as a guide to determine potential impacts. Increasing or reducing multipliers will have implications for the model.
- Assumes that each project has a discrete and unique workforce, and there is no movement of workers between projects.
- Total numbers of workers and dependants have been rounded up.

Table 8: Employment/population forecasts<sup>1</sup> – 2011 to 2025

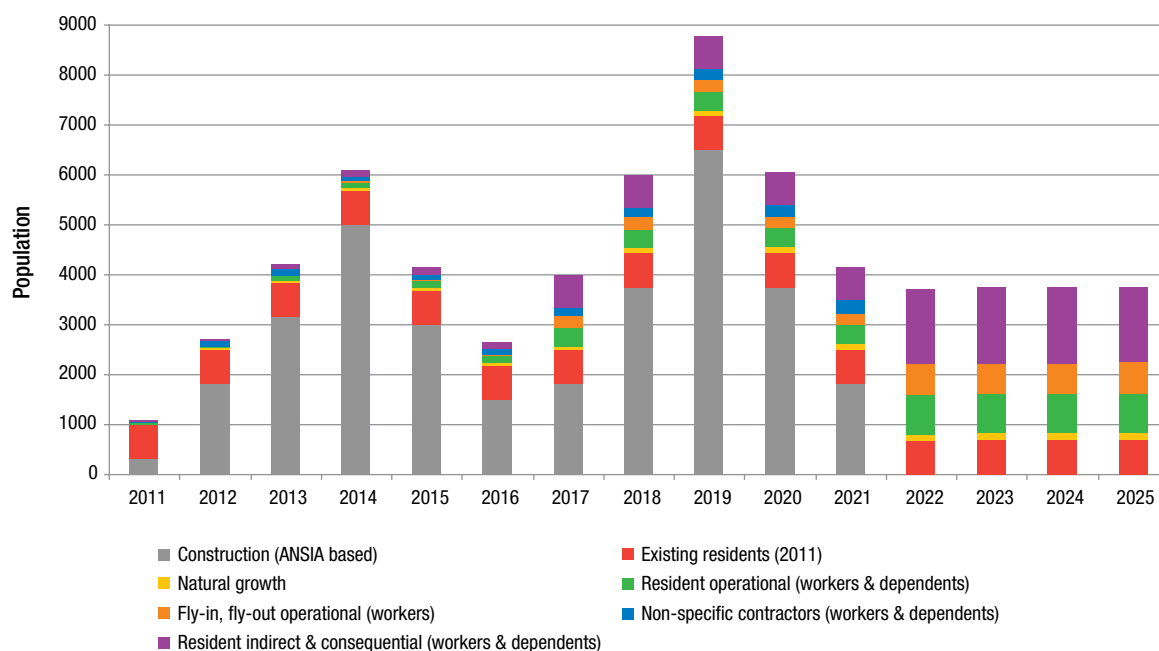
Employment category <sup>2</sup>		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
ANSIA based	Construction - Macedon	300	300	150	0	0	0	0	0	0	0	0	0	0	0	0
	Construction - Wheatstone	0	1500	3000	5000	3000	1500	0	0	0	0	0	0	0	0	0
	Construction - second LNG	0	0	0	0	0	0	1500	3000	5000	3000	1500	0	0	0	0
	Construction - ammonia/urea	0	0	0	0	0	0	100	250	500	250	100	0	0	0	0
	Construction - ammonium nitrate	0	0	0	0	0	0	100	250	500	250	100	0	0	0	0
	Construction - methanol	0	0	0	0	0	0	100	250	500	250	100	0	0	0	0
	<b>Total ANSIA based</b>	<b>300</b>	<b>1800</b>	<b>3150</b>	<b>5000</b>	<b>3000</b>	<b>1500</b>	<b>1800</b>	<b>3750</b>	<b>6500</b>	<b>3750</b>	<b>1800</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Town based	Existing residents (2011)	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
	Natural growth	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
	Non-specific contractors (workers and dependants)	46	109	142	115	121	123	156	186	216	246	279	0	0	0	0
	FIFO operations (workers)	0	0	12	12	12	12	237	237	237	237	237	605	605	605	605
	Resident operational (workers and dependants)	20	43	84	110	130	130	378	378	378	378	378	784	784	784	784
	Resident indirect and consequential (workers and dependants)	20	42	100	124	142	142	660	660	660	660	660	1517	1517	1517	1517
	<b>Total town based</b>	<b>796</b>	<b>914</b>	<b>1068</b>	<b>1101</b>	<b>1155</b>	<b>1167</b>	<b>2201</b>	<b>2241</b>	<b>2281</b>	<b>2321</b>	<b>2364</b>	<b>3726</b>	<b>3736</b>	<b>3746</b>	<b>3756</b>
<b>Total</b>	<b>Total service population</b>	<b>1096</b>	<b>2714</b>	<b>4218</b>	<b>6101</b>	<b>4155</b>	<b>2667</b>	<b>4001</b>	<b>5991</b>	<b>8781</b>	<b>6071</b>	<b>4164</b>	<b>3726</b>	<b>3736</b>	<b>3746</b>	<b>3756</b>

Source: Based on data supplied by the Department of State Development, Department of Planning and LandCorp (2011).

<sup>1</sup> Includes employment/population impacts for development of Macedon, Wheatstone, Onslow Salt expansion, second LNG, ammonia/urea, ammonium nitrate and methanol plant projects. Project timing as per Figure 10. Changes to project timing will impact the accuracy of these tables.

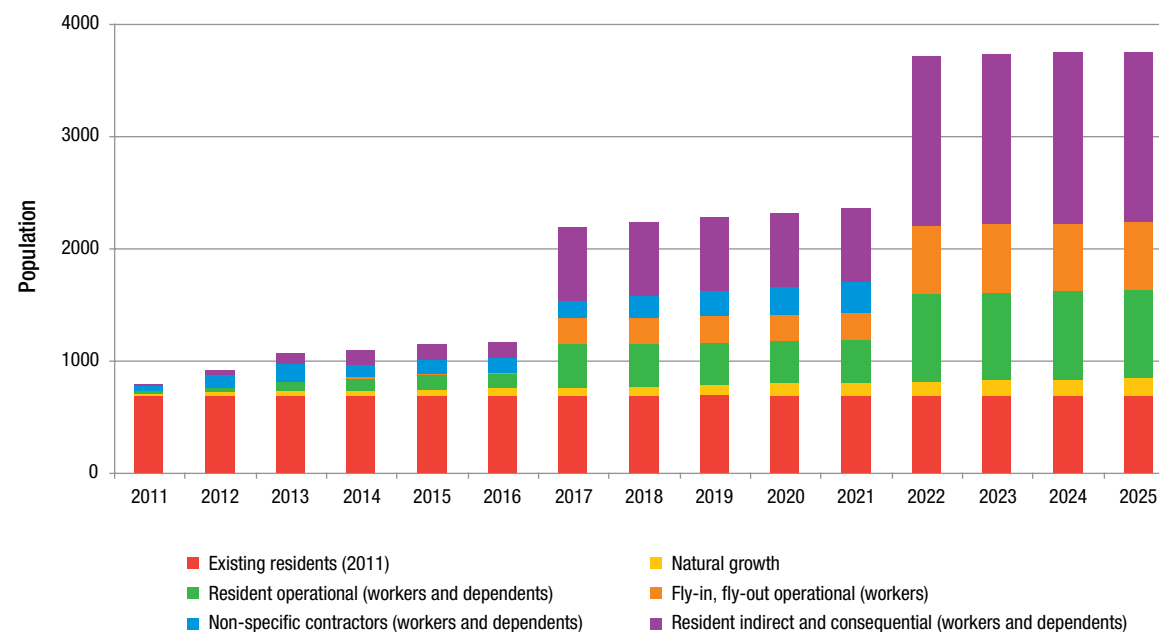
<sup>2</sup> Definitions for the variables listed under each column are outlined in the 'Summary of Definitions and Assumptions' (see end of section 4.1).

Figure 11: Forecast employment/population growth to 2025 – ANSIA and Onslow townsite



Source: Based on data supplied by the Department of State Development, Department of Planning and LandCorp (2011)  
See end of section 4.1 of this document for definitions and assumptions.

Figure 12: Forecast employment/population growth to 2025 – Onslow townsite



Source: Based on data supplied by the Department of State Development, Department of Planning and LandCorp (2011)  
See end of section 4.1 of this document for definitions and assumptions.



## Employment forecasts – summary of definitions and assumptions

### Definitions

**Consequential population** – the number of persons following the application of consequential workforce multipliers and family/singles ratio. As part of this modelling exercise, the indirect population has been calculated using resident and FIFO operational workers and the indirect population.

**Consequential workers** – workers who locate to Onslow because of flow-on economic opportunities generated by the commencement of resource projects (for example, health, education and service industries).

**Family multiplier** – the number of additional dependants associated with a locally-based resident worker.

**Family/singles ratio** – the ratio of resident workers who bring families (dependants) to singles (those who are not arranged in families).

**FIFO** – workers that are employed on a FIFO basis.

**Indirect population** – the number of persons following the application of indirect workforce multipliers and family/singles ratio. As part of this modelling exercise, the indirect population has been calculated using both resident and FIFO operational workers.

**Indirect workers** – workers who locate to Onslow due to opportunities generated by the commencement of resource projects (for example, equipment suppliers, welders and fitters and turners).

**Natural/organic growth** – the number of persons coming to Onslow due to non-project related factors (assumed to be a total increase and is therefore deemed to include singles and families). This increase may include retirees or those moving for a lifestyle change and the like.

**Non-specific (construction) contract workers** – workers who permanently move to Onslow to provide services to one or many proponents during the construction phase of projects. This component of the workforce is not directly affiliated to one proponent.

**Operational workers** – workers associated with the operations phase of a particular project. Operational workers are either FIFO or resident in Onslow.

**Project workforce** – the number of FIFO and resident workers.

### Project staging assumptions

**Macedon** – 2.5 year construction phase commencing 2011 and finishing in 2013; operations phase commencing end of 2013 (16 persons).

**Wheatstone** – 5 year construction phase commencing 2012; operations phase commencing in 2017.

**Onslow Salt expansion** – requirement for 35 dwellings between 2011 and 2016.

**Second LNG facility** – 5 year construction phase commencing 2017; operations phase commencing 2022.

**Other industries (ammonia/urea, ammonium nitrate and methanol plant)** – 5 year construction phase commencing 2017; operation phase commencing 2022.

**Non-specific contract workforce (see definition)** – majority of this employment is anticipated to occur in the early stages of construction based on contractors desire to take advantage of full construction life cycle. It should be noted that the incidence of this population category could increase in line with greater opportunities/commencement of projects.

**Natural growth (see definition)** – population growth not associated with projects. As with the non-specific contract workforce it should be noted that the incidence of this population category could increase in line with greater opportunities/commencement of projects which in turn will lead to a higher level of amenity in Onslow.

## General assumptions

Indirect/consequential workforce multipliers - as there is currently no consistent, endorsed set of indirect or consequential multipliers in Western Australia, relevant assumptions have been made based on investigations previously undertaken (detailed in section 4.1). Discussion with proponents and agencies was used to refine possible multipliers. An indirect employment multiplier of 0.30 (per resident locally-based worker) and a consequential employment multiplier between 0.20-0.30 (per resident locally-based worker) has been applied. It is important to note that there is no way to accurately forecast actual multipliers. However, it is essential that a well thought through allowance is made for this element of growth as this often hidden demand can have a major impact on a town's future requirements and growth strategy (PICC 2010, *Planning for resources growth in the Pilbara: revised employment and population projections to 2020*, page 7).

Note: to calculate the impact of the FIFO workforce on the Onslow community lower multipliers have been applied. This is based on the assumption that the partial self-amenity provided in these worker villages will reduce the flow-on multiplier effect.

**Non-specific (construction) contract workers** – given Onslow's remoteness and high transportation costs, these workers are assumed to be permanently locally based (resident) in Onslow.

**Family/singles ratio** – a family/singles ratio of 70/30 has been used in these forecasts for indirect, consequential and non-specific contractor workers. For example, for every 100 workers, 70 will be accompanied by dependants (workers with families) and 30 will be single. This is consistent with the Shire of Ashburton's *Onslow Townsite Strategy*. All resident operational workers (locally based) are assumed to be workers with families and are therefore deemed to have a 100 per cent family ratio.

Operational workers (FIFO) are assumed to be single and are therefore deemed to have a 100 per cent singles ratio. They are NOT subject to the family multiplier.

**Natural/organic growth** – an estimated annual figure, stated as a total increase. Assumed to include a changing mix of singles and families and will therefore not be subject to the set family/singles ratio.

**Family multiplier (project workforce)** – for those locally-based resident workers with families, a multiplier of 3.3 has been applied to calculate the population. This is consistent with Chevron Australia's social impact assessment that has been prepared for the Wheatstone project. This is indicative of the demographic characteristics of mining populations (high proportion of workers in 20-35 age bracket hence the greater likelihood of young children).

**Family multiplier (indirect and consequential)** – the family multiplier for workers that are part of the indirect and consequential population is 2.5. This more closely aligns with the indicative household size for the Pilbara.

**Natural/organic growth** – a set annual estimate has been made to ensure all aspects of hidden demand are included. As amenity in Onslow increases, this figure has the potential to increase accordingly.

## Multiplier summary

Indirect workforce multiplier (resident): 0.3

Indirect workforce multiplier (FIFO): 0.3

Consequential workforce (resident): 0.3

Consequential workforce (FIFO): 0.2

Project specific (operations) family multiplier: 3.3  
(or 1 worker + 2.3 dependants)

Non-project specific (non-specific contractor, indirect, consequential) family multiplier: 2.5  
(or 1 worker + 1.5 dependants)

Family/single ratio (per 100 workers): 70/30 (resident operational workers are assumed to be 100 per cent families, FIFO operational workers are assumed to be 100 per cent singles).

Given the complexity of the analysis that has been undertaken, spreadsheets and flowcharts (see Appendix A) have been devised to illustrate the conceptual and computational flow of the modelling exercise that has been undertaken.

## 4.2 Population and employment projections – Onslow Townsite Strategy

The *Onslow Townsite Strategy* investigates various urban growth scenarios based on development of the ANSIA by multiple users. The forecasts include estimates of base and indirect employment and associated land and dwelling requirements (Table 9). The various scenarios are:

- Scenario 1 Base case – no development of the ANSIA, additional employment of 160 (100 base and 60 indirect).
- Scenario 2 Low growth – 25 per cent development of the ANSIA, additional employment of 400 (250 base and 150 indirect).
- Scenario 3 Medium growth – 75 per cent development of the ANSIA, additional employment of 800 (500 base and 300 indirect).
- Scenario 4 High growth – 100 per cent development of the ANSIA, additional employment of 1600 (1000 base and 600 indirect).
- Scenario 5 Extreme growth – more than 100 per cent development of the ANSIA, additional employment of 2400 (1500 base and 900 indirect).

The scenarios are based on the following assumptions:

- Base employment: employment living on a residential basis in the Onslow township irrespective of the development of the ANSIA. It does not include Onslow Salt, support industrial, support community uses or tourism.

- Indirect employment: additional employment generated by the ANSIA activities. This includes people working for contractors associated with ANSIA activities as well as people working in the service sector (for example, teachers, nurses, council workers and retail staff). A base indirect employment ratio of 1: 0.6 to has been used.
- Household formation: two basic household types have been used: single (30 per cent of total employment) and family (70 per cent of total employment).
- Fly-in, fly-out: the Shire of Ashburton supports FIFO operations where it is directly related to the construction of the respective project. There is an expectation that operational staff associated with the ANSIA and Onslow Salt will be located within the Onslow townsite. This indicates that all operational workers should be locally based.

Based on the anticipated development of the ANSIA and the Shire's position on FIFO, a medium to high development scenario is anticipated. Assuming a medium to high development scenario eventuates, it is estimate that more than 750 new base jobs and 450 indirect jobs would be established, generating demand for 1200 additional dwellings in Onslow. Using an average of 2.2 persons per dwelling, this would result in a population increase of 2640 persons.

## 4.3 Population and employment projections – PICC

Part of the Chamber of Minerals and Energy, the Pilbara Industry's Community Council (PICC) was established in 2006 to develop a shared vision and strategy in relation to the sustainability of Pilbara towns, and improve Indigenous employment participation. PICC is also working to develop strategies to reduce gaps in education and training, health and housing. Membership of PICC includes BHP Billiton Iron Ore, Chevron Australia, Fortescue Metals Group, North West Shelf Venture, Rio Tinto Iron Ore and Woodside.

**Table 9: Development scenarios – Onslow Townsite Strategy**

Scenario	Base employment	Indirect employment	Household formation		Total dwellings
			Single (30%)	Family (70%)	
1: Base	100	60	48	112	210
2: Low	250	150	120	280	400
3: Medium	500	300	240	560	800
4: High	1000	600	480	1120	1600
5: Extreme	1500	900	720	1680	2400

Source: Onslow Townsite Strategy Background Report, Shire of Ashburton (2010)

\*Note: Base case scenario includes a need to cater for a latent demand for 50 houses (that is 160+50)

PICC is undertaking joint planning for major growth in the output of the resources sector in the Pilbara region to 2020. As part of this work, PICC is looking to broaden the understanding of the implications of this growth for service and infrastructure provision arising from the resulting employment and population changes in the region. In 2008, PICC engaged Heuris Partners Ltd to compile a bottom-up picture of major planned and potential resource projects and model the resulting direct and multiplier impacts on Pilbara employment and population growth out to 2020. These figures build on the WAPC's population projections by providing projections on townsites populations and assumptions about service and FIFO populations. Completion of this work coincided with the onset of the Global Financial Crisis, which resulted in the delay or cancellation of a number of projects. Recent economic activity has seen a return of strong interest in new or expanded resource projects in the Pilbara region. In light of this renewed investment outlook, a review of the employment and population projections was prepared and published in May 2010.

The PICC approach involved estimating workforce numbers and then applying multiplier assumptions to determine the total workforce and resident population. The projections produced in 2008 represent the impact from PICC members, and not the total impact from all resource and infrastructure investment in the

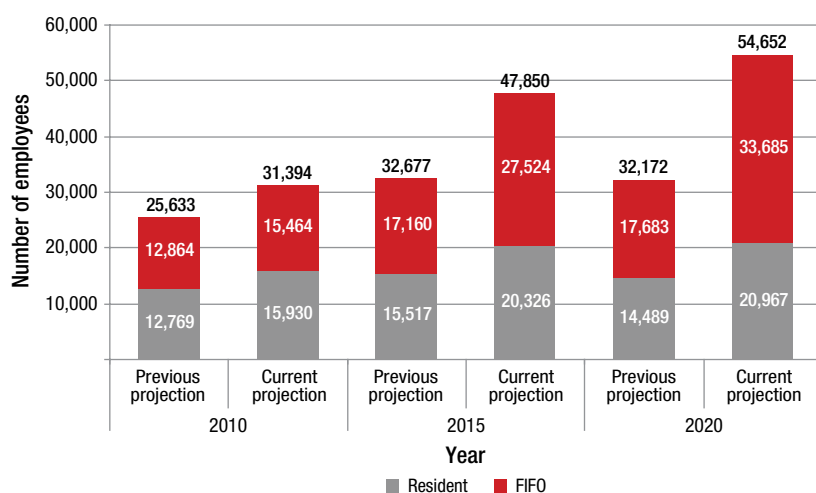
region. The projections prepared in 2010; however, include input from a broader range of sources, including non-PICC member projects.

The 2008 figures were considered by government and industry, and stakeholders reached a consensus to use an agreed set of population figures. The WAPC supported the use of the PICC figures for planning purposes, but notes that the *WA Tomorrow* figures should be used for predicting resident population growth in the region.

The 2010 PICC data indicate that, at a regional level, resource-related employment is projected to grow from 31,000 in 2010 to 47,000 in 2015, and reach more than 54,000 by 2020 (excluding construction workers). These figures are significantly higher than the 2008 projections (an additional 15,000 workers by 2015). Other key points include residential employment increasing by 28 per cent over the period 2010 and 2015, and FIFO employment increasing by 83 per cent between 2010 and 2015, and by a further 23 per cent to 2020. This information is detailed in Figure 13.

PICC data suggest that the contribution of FIFO workers to the total resource-related employment will increase over time, from 49 per cent in 2010 to more than 61 per cent of total resource related employment in 2020. This larger component of FIFO workers is an increase over 2008 figures.

**Figure 13: PICC resource related employment (2008 and 2010 projections) - Pilbara Region**



Source: Planning for resources growth in the Pilbara: revised employment and population projections to 2020, Pilbara Industry's Community Council, (2010)

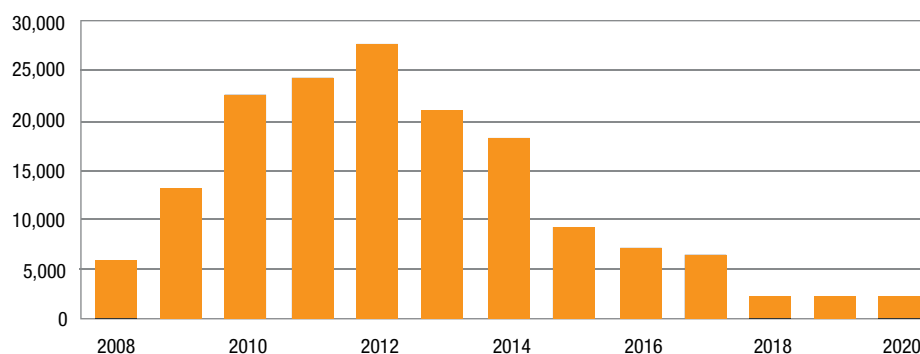
Construction employment is anticipated to peak at approximately 28,000 in 2012 and drop away sharply from 2015 onwards. These estimates are likely to be conservative due to a number of resource companies choosing only to include construction employment for new and existing projects at an advanced planning or approvals stage. The estimated construction employment for the Pilbara region over the period 2008 to 2020 is shown in Figure 14.

Combined resident, FIFO and construction workforce projections by location are shown in Figure 15. These data indicate that the combined population for the Pilbara

region reaching more than 103,000 by 2012 before stabilising to approximately 98,000 persons over the period 2015 to 2020. This is significantly higher than the 2008 projections which estimated a peak of 75,000.

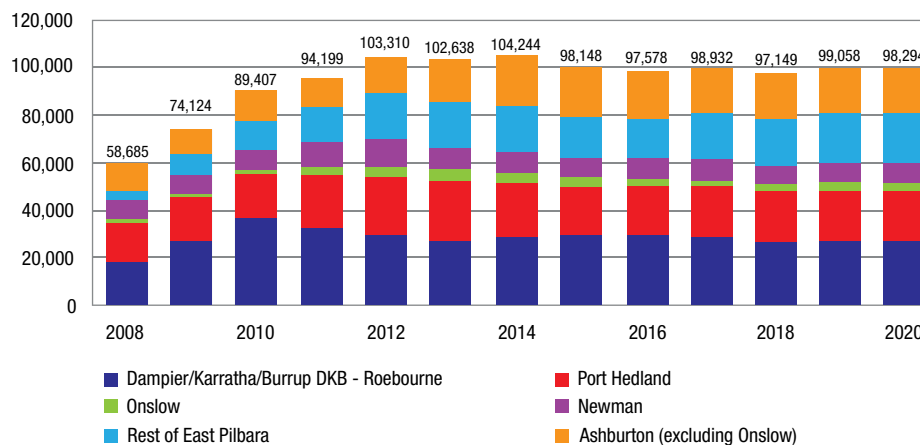
The PICC projections include an estimate of the resident population in addition to the employment projections. These have been prepared by applying indirect employment and family multiplier assumptions to the projected resident employment data.

**Figure 14: Construction employment projections (2008 to 2020) – Pilbara region**



Source: Planning for resources growth in the Pilbara: revised employment and population projections to 2020, Pilbara Industry's Community Council, (2010)

**Figure 15: Combined resident, FIFO and construction workforce projections by location**



Source: Planning for resources growth in the Pilbara: revised employment and population projections to 2020, Pilbara Industry's Community Council, (2010)

**Table 10: PICC Combined resident, FIFO and construction projections 2010 to 2020 – Onslow**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Resident	679	-	-	-	-	2360	2360	2360	2360	2360	2360
Fly-in, fly-out	-	-	-	-	-	0	-	-	-	-	0
Construction	-	-	-	-	-	1500	-	-	-	-	0
<b>Total</b>	<b>864</b>	<b>2479</b>	<b>4366</b>	<b>4190</b>	<b>4190</b>	<b>3860</b>	<b>2360</b>	<b>2360</b>	<b>2360</b>	<b>2360</b>	<b>2360</b>

Source: Planning for resources growth in the Pilbara: revised employment and population projections to 2020, Pilbara Industry's Community Council, (2010)

The PICC figures do not, however, provide much detail in relation to what proportions of the population are resident, FIFO and construction workers for Onslow other than for the years 2015 and 2020. In this regard, 38.8 per cent or 1500 people are expected to be involved with construction in 2015, with the remaining 61.1 per cent or 2360 being resident (no FIFO listed). No FIFO or construction workforces were assumed beyond 2015.

These numbers should be regarded as illustrative. For smaller townships like Onslow, the projection numbers of the PICC report are particularly sensitive to assumptions about the timing and location of workforce changes and the balance of FIFO and locally based employment. In addition, the numbers do not reflect the possible total number of people drawing on town services; for example, by FIFO and construction employment located within township catchment areas.

The PICC report states that iron ore projects remain the dominant driver of operating employment in the Pilbara with oil and gas projects tending to be very capital intensive, employing relatively fewer operating staff and generating very high demands for construction workers. This is evident in the figures for Onslow, compared with the other iron ore based Pilbara towns.

The PICC projections use multipliers between 0.2-1 to estimate additional indirect employment generated from the resource projects.

As previously stated, the use of local employment multipliers for resource industry projects needs to be treated with caution. A true local employment multiplier relies on an employee spending enough of their income to support other businesses and employees in the local economy. Multiplier benefits from resource projects rely not only on employee spending, but also on the extent of the locally based contracting practices of resource companies.

## 4.4 Resident population projections – WAPC

In its role as the State's demographer, the WAPC produces forecasts of the State's resident population for the WAPC. These forecasts are based on assumptions about fertility, mortality and migration. These projections are prepared at a local government level. Data for smaller townsite areas is unavailable.

According to population projections released in 2005, the Shire of Ashburton's resident population is expected to remain stable over the next five and 10 years respectively (from 2011). Over the same period, the State is expected to achieve a growth rate of 1.5 and 1.4 per cent respectively (Table 11). Note that while population projections are often represented as average annual growth rates, in Pilbara towns, population and employment growth tends not to occur at a steady annual rate, but rather as step change in response to other factors, such as resource project construction cycles.

There are significant population pressures in the Pilbara caused by FIFO workers and short-term contract workers which are not represented by WAPC forecasts. This additional service population is significant and could add up to 25 per cent to the resident population. The impact of these extra people is not uniform and it is likely that those living in remote areas will exert different pressures to those in regional towns. These issues are discussed in the ABS report, *Towns of the Mineral Boom*.

Data shown in Table 11 reflect a business as usual approach and does not take into account development of major resource projects or State Government initiatives to encourage and support growth in Onslow. If these projects are delivered, the DoP/WAPC would anticipate higher growth rates in both the resident and service populations than those shown in Table 11.

An update to the *WA Tomorrow* projections is due to be released in 2011 (long-term projections – 25 years). Future updates will include both short term and scenario based projections (25 years plus), which are particularly relevant for settlements in the Pilbara.

Age sex profiles based on WAPC projections to 2021 for the Shire of Ashburton (Figure 16) show similar characteristics to those recorded at the 2006 Census. The data indicate a projected decrease in the proportion of children aged 0-9 years and an increase in the proportion of middle/retirement aged residents, in line with general trends of an ageing population. As Onslow



**Table 11: WAPC population projections<sup>1</sup> 2011 to 2031**

Local government	Projected population 2011	Projected population 2016	Projected population 2021	Projected population 2031	Average annual growth 2011-2016 (per cent)	Average annual growth 2011-2021 (per cent)	Average annual growth 2011-2031 (per cent)
Ashburton	6000	6000	6000	5700	0.0	0.0	-0.3
East Pilbara	7500	7500	7000	6300	0.0	-0.7	-0.9
Port Hedland	14,500	15,100	15,800	16,800	0.8	0.9	0.7
Roebourne	16,400	18,000	19,400	21,400	1.9	1.7	1.3
<b>Total Pilbara region</b>	<b>44,400</b>	<b>46,600</b>	<b>48,200</b>	<b>50,200</b>	<b>1.0</b>	<b>0.8</b>	<b>0.6</b>
<b>Total Western Australia</b>	<b>2,210,400</b>	<b>2,376,400</b>	<b>2,534,600</b>	<b>2,800,700</b>	<b>1.5</b>	<b>1.4</b>	<b>1.2</b>

Source: Western Australia Tomorrow, Western Australian Planning Commission (2005)

<sup>1</sup> Projection for resident population

accounts for only a small portion of the Shire's total population (approximately 10 per cent), care should be taken when using shire-based population data as trends for the Shire may not necessarily be indicative of trends for Onslow.

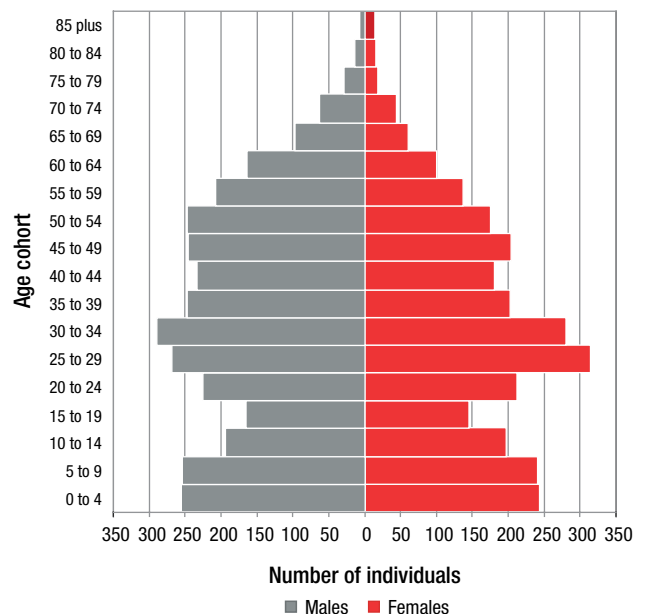
## 4.5 Population targets – Pilbara Cities

The Pilbara Cities initiative, announced in November 2009, aims to encourage more people to live and settle in the Pilbara. The State Government's vision is for modern vibrant regional centres that can support and deliver skilled workforces for the Pilbara's major economic projects. Realising the vision rests on the promotion of quality regional living with modern services and facilities which will encourage the development of strong local communities.

Resident population growth is critical to achieving the Pilbara Cities vision, with targets of 50,000 persons set for each of Karratha and Port Hedland by 2035. To achieve this target, both centres would need to sustain an average population growth of approximately four to five per cent annually over the next 25 years.

No targets have been set for the other remaining Pilbara towns or settlements at this time, with exception of Newman where the Pilbara Cities initiative suggests a population target of 15,000.

**Figure 16: WAPC age sex profile 2021 – Shire of Ashburton**



Source: Western Australia Tomorrow, Western Australian Planning Commission (2005)

### Population and employment projections – for more information see the following links:

Population and employment projections – for more information see the following links:

Australian Bureau of Statistics: [www.abs.gov.au](http://www.abs.gov.au) see Catalogue 4102.0 - Australian Social Trends 2008 Article - Towns of the Mineral Boom

Chamber of Minerals and Energy Western Australia: [www.cmewa.com.au](http://www.cmewa.com.au) see Pilbara Industry's Community Council (PICC)

Department of Planning, Western Australian Planning Commission: [www.planning.wa.gov.au](http://www.planning.wa.gov.au) see WAPC Statement - Agreement to use PICC population and employment projections for forward planning in the Pilbara, Western Australia Tomorrow - Population Report 6

Regional Development Australia Pilbara: [www.rdapilbara.org.au](http://www.rdapilbara.org.au) see Pilbara Plan

Shire of Ashburton: [www.ashburton.wa.gov.au](http://www.ashburton.wa.gov.au) see Onslow Townsite Strategy

## 5 Land and housing demand

### Key points

- The median house price for Onslow (year to December quarter 2010) was \$615,000 which is higher than that recorded in the Perth metropolitan region (\$496,000). Prices have increased strongly since 2004, due to increased demand and constrained supply (and speculation over the commencement of resource projects).
- REIWA data indicate that the median sales price of vacant residential lots in Onslow (year to December 2009) is \$180,000 which is less than that recorded in the Perth metropolitan region (\$245,000). No residential vacant land sales were recorded in 2010. Analysis of lots for sale as at late May 2011; however, indicates that only two vacant lots were available for sale, listed at upwards of \$300,000.
- Rents have also increased substantially with few properties currently available, with weekly rents of more than \$2000 being recorded.
- The *Onslow Townsite Strategy* details various development scenarios indicating additional dwelling requirements ranging from 210 dwellings (base case) to 2400 dwellings (extreme scenario).
- Demand for future housing is likely to increase due to increased activity in the resources sector. Using State Government employment/population forecasts, there is an estimated need for an additional 676 dwellings (495 family and 181 single units) within the townsite, two transient workforce accommodation camps for operational workers (1 with 20 bed capacity and 1 with 225 bed capacity) and ANSIA based camps for construction workers (up to 5000 beds) by 2017.
- Beyond BHP Billiton Petroleum projects and Chevron Australia projects, forecasting for additional housing demand (numbers and housing types) is challenged by the need to consider a number of variables. Demand will depend on the certainty of other major projects (including a possible second gas plant) and associated industries, the residential nature of operational workforces (FIFO or residential based), the family status of operational workforces, key service workers and contractors that directly or indirectly result from the operation of major projects.
- Workers associated with construction of major foundation projects are to be housed in temporary serviced single accommodation, located at the ANSIA rather than within the townsite area.
- There is likely to be a peak demand for additional independently managed accommodation for visiting workers not directly associated with resource development projects to use on a temporary basis.
- There is a need for a more diverse range of housing in the town including more medium density dwellings and affordable accommodation for key service workers, aged and other low income earners.
- Demand for industrial land appears to be increasing with keen interest shown in new lease areas at the Beadon Creek Maritime Facility. The Shire of Ashburton's call for expressions of interest in proposed industrial land at the airport will also test demand levels. Demand for general industrial land will likely be met through the release of land within the ANSIA (subject to approvals).
- Future commercial land and floorspace needs have not been formally investigated and may become more apparent with development of the townsite structure plan and the town centre revitalisation plan. Preparation of a commercial/retail strategy may need to be considered.

## Actions and priorities

- Immediate planning for short term temporary accommodation for workers not directly associated with resource development projects.
- A detailed local housing strategy is required to assess varying housing needs (including factors such as numbers, design mix/types and level of permanency of tenure and structure) together with integrated plan of delivery involving the private, public and community sectors.

number of sales recorded. The median sales price for the 2009 (year to December) was \$180,000, which is approximately \$44,000 less than that recorded for the Perth metropolitan area. One sale has been recorded to date in 2011, with \$450,000 paid for a 1133 m<sup>2</sup> block (capable of yielding three dwellings).

An assessment of land for sale in Onslow conducted in late May 2011 showed there were two residential zoned lots for sale. The advertised for sale price of the residential zoned land was \$300,000 and \$320,000, for lots of 760 m<sup>2</sup> and 811 m<sup>2</sup>.

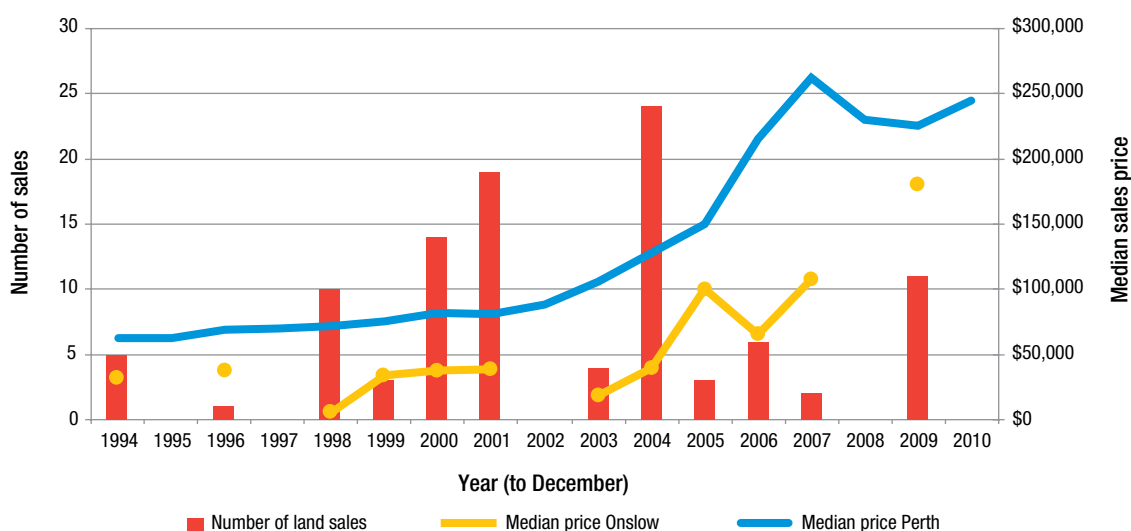
## 5.2 House and unit sales

### 5.1 Residential land sales

Between 1994 and 2010, there has been an average of nine vacant land sales per year (Figure 17). This has varied considerably, with a peak of 24 sales recorded in 2004 and nine years recording two or fewer sales (no sales recorded in 1995, 1997, 2002, 2008 and 2010). The median sales price for vacant residential lots in Onslow more than doubled over the period 2006 to 2009, although this data should be used with caution given the low

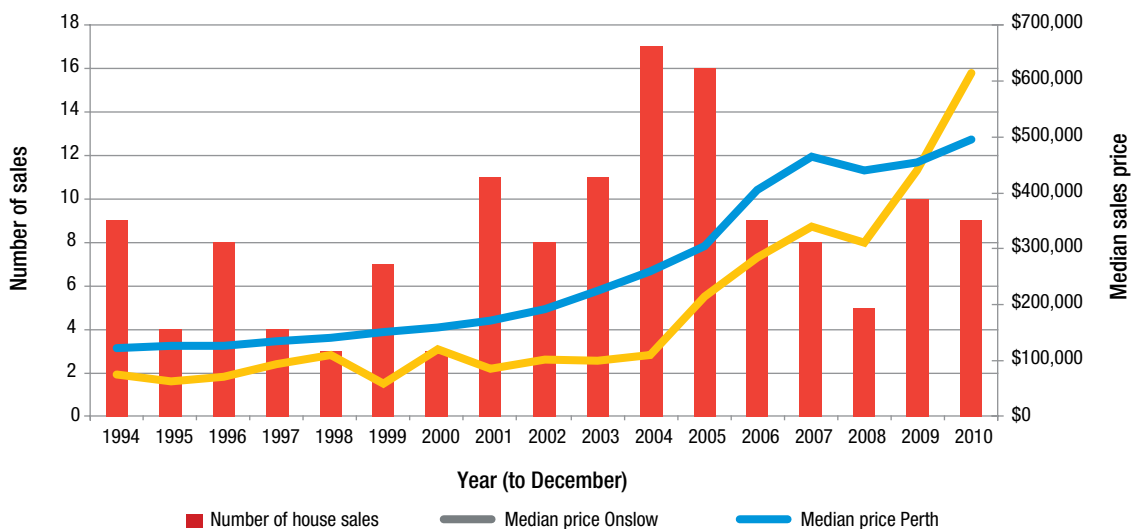
The median house price for Onslow for the year to December 2010 was higher than that recorded in Perth (\$615,000 compared with \$496,000 for the year to December 2010). The median house price has increased sixfold in the past seven years, increasing from a median of \$100,000 in 2003 (Figure 18). This is in line with general market trends, but could also be attributed to speculation in the market, given the possible development of resource projects in the vicinity of Onslow. Only one unit sale has been recorded since 1994, therefore unit sales information has not been reported in this document.

Figure 17: Residential land sales 1994 to 2010 – Onslow



Source: Real Estate Institute of Western Australia (2011)

Figure 18: House sales 1994 to 2010 – Onslow



Source: Real Estate Institute of Western Australia (2011)

### 5.3 Building approvals

High housing costs make it difficult for employees to afford to live in resource towns unless they receive a significant level of accommodation support from their employer. Resource companies often provide staff with this assistance; however, many retail, personal services, hospitality and tourism companies cannot provide this level of accommodation support.

Scarce housing limits diversity in the economy, the ability for private and public organisations to provide services and the opportunity for the towns to develop mature, functioning housing and labour markets. This contributes to a high turnover of workers as families tend to only stay in for as long as a job lasts and then move away. It also leads to the displacement of lower-income households from town (both renters and potential purchasers). The volatility of house prices also acts as a disincentive to prospective longer term residents making a financial commitment to living in the town.

An assessment of residential dwellings for sale in Onslow conducted in late May 2011 showed that a total of six dwellings were available for sale. Of these listings the prices ranged from \$640,000 to \$790,000 with a median listing price of \$750,000.

Building approvals data collected by the ABS show the number of new residential buildings granted approval in Onslow between June 2002 and September 2010 peaked at 23 for the year 2006, with most approvals occurring in the March and June quarters respectively (Figure 19).

Residential building approval activity in Onslow has been traditionally low with most years (other than 2006) experiencing between zero and eight total per annum residential approvals. Aside from two other residential approvals being granted for the three month period to June 2002 and three for the three month period to March 2010, all approvals were for new houses. Note that building approvals may have been held up due to lack of water connections being available, rather than this being reflective of low demand.

While residential building approvals have been fairly low, it is important to note the significant amount of recent planning approvals granted for single residential use conversions to "Residential Building" use. *The Shire of Ashburton Town Planning Scheme No. 7* defines a "Residential Building" as a building or portion of a building to be used for human habitation temporarily by two or more persons, or permanently by seven

or more persons. Over the past 18 months or so, 13 residential building conversions have been approved resulting in the possible accommodation of 66 people in existing premises. This demonstrates demand for alternative housing options that are not currently available.

## 5.4 Residential building costs

Relative to other states, Western Australia along with the Northern Territory experienced the largest increases in house building costs over the five years to September 2009, at eight per cent growth per annum. This was likely due to the boom in the mining and construction sectors. Macromonitor's *Australian Construction Cost Trends* report (2010) forecasts construction costs in Western Australia to increase by five to six per cent per annum over the period 2011 to 2013 before slowing to two per cent by 2015.

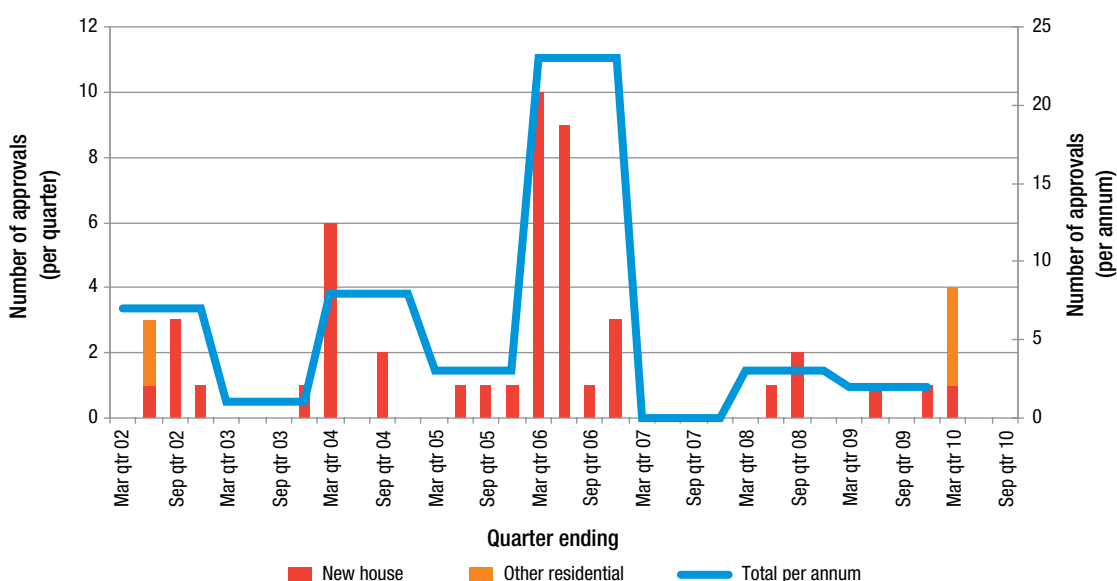
Building costs experienced in the Pilbara region are significantly higher than those recorded for the Perth metropolitan region. Anecdotal evidence suggests that the cost of building a standard home in Pilbara towns (four bedroom, two bathroom) is approximately \$400,000-\$500,000 (excluding land costs).

A typical standard dwelling costs approximately \$180,000-\$250,000 to construct in the metropolitan region; therefore, the costs for a similar product in the Pilbara are approximately double that of the Perth metropolitan region.

Building approval data obtained from the ABS indicates that the average cost per square metre for new houses has almost doubled over the last 10 years (Figure 20). Costs per square metre in the March quarter 2010 were calculated at \$955 for the Perth statistical division and \$1101 for the balance of the State (for new houses). A peak of \$1260 per square metre was recorded in the December quarter 2008 for the balance of the State.

The National Housing Supply Council's 2008 State of Supply report indicated that the average cost per square metre of new work for detached houses in 2008 was \$961 for Perth and \$1092 for the balance of WA. The total figure for WA at \$1006 per square metre was the second most expensive in the country, second only to the Northern Territory. Costs per square metre for semi-detached dwellings were slightly higher at \$1186 and \$1354 respectively. Analysis undertaken by the DoP using data sourced from the Town of Port Hedland indicate an average cost per square metre of \$2205 for new single houses. Average cost per square metre was calculated using building licence data over the period January 2009 to April 2010.

Figure 19: Building approvals 2001 to 2010 – Onslow



Source: Building approvals (data available on request), Australian Bureau of Statistics (2010)



Information in the Pilbara Towns Housing Study (unpublished) notes that the cost differential may be due to a lack of competition amongst builders, distance and freight costs, and high labour costs as a result of labour shortages. Difficulties in securing affordable accommodation also impacts on the availability of tradespersons and labour costs. These costs are generally passed on to the purchaser.

The *Karratha Town Revitalisation Economic Analysis* (prepared by Pracsys for LandCorp and the Shire of Roebourne) identifies the lack of a local construction capability as one of the primary reasons for high construction costs throughout the Pilbara region, reporting that local producer services capability is taken up with servicing resource and infrastructure projects at the expense of civil infrastructure and housing projects. High housing and accommodation costs for employees who don't have access employer subsidies or employer housing makes it difficult for this type of workforce to establish themselves in Pilbara towns.

A detailed study into building costs in the Pilbara would be beneficial in determining which of the construction component costs account for the overall increased costs experienced in the region, and how these costs could potentially be reduced.

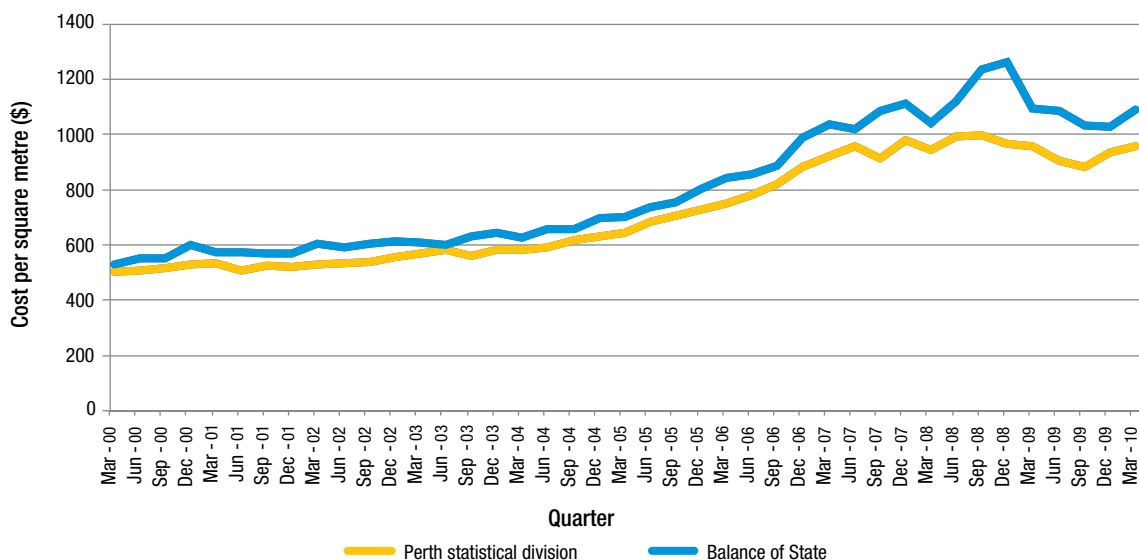
The Shire of Ashburton has advised that there are no registered builders or building companies based at Onslow. New housing is mostly pre-constructed/transportable with more than 60 transportable dwellings being brought into Onslow over the past 10 years and a further 10 transportable homes are expected in the near future. Only one house was built on site in 2010.

### 5.5 Residential rentals

The *Onslow Townsite Strategy Background Report* (2010) advises that there are relatively few houses for sale and rent in Onslow resulting in a significant rise in house price at the time this report written. Most available properties are older and in generally poor condition, with the value being more reflective of the land than the dwelling structure. An assessment of residential dwellings for rent in Onslow conducted in late May 2011 showed only one dwelling available for rent, with a listed rent of \$2500 per week.

Data collected in the 2006 Census show 137 residential dwellings were reported as being rented in Onslow (Figure 21). A total of 45, or approximately 33 per cent of all rented dwellings were classed as being rented through "other landlord type" which includes government and private employers or through residential

Figure 20: Average building costs per square metre for new houses – 2000 to 2010



Source: Building approvals (data available on request), Australian Bureau of Statistics (2010)

parks. Where rent was below \$225 per week “other landlord type” and “state or territory housing authority” provided 42 and 30 dwellings respectively. A total of 26, or approximately 20 per cent of all rented dwellings were reported as rented through housing cooperative, community or church groups.

## 5.6 Pilbara Towns Housing Study

The Pilbara Towns Housing Study (2009, unpublished) assessed the housing market conditions and unmet housing needs (to 2015) in the Pilbara towns of Karratha, Port Hedland, Onslow, Newman, Roebourne and Tom Price.

A joint initiative of the Department of Housing (DoH) and the Pilbara Development Commission, the study reported the following:

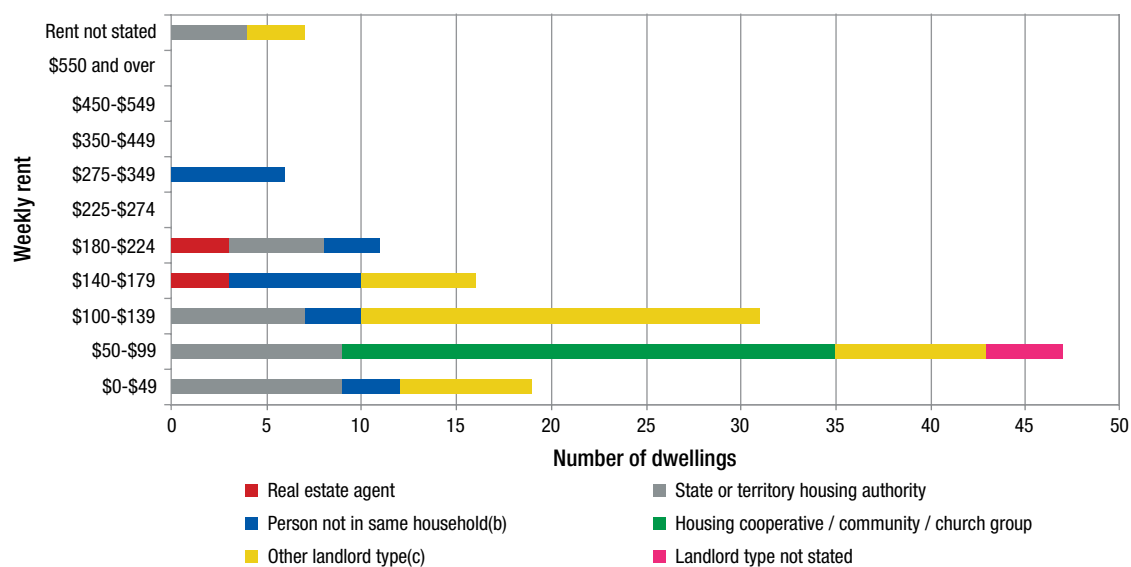
- A current apparent demand for an additional 1433 dwellings across the Pilbara region (34 dwellings for Onslow). This includes unmet housing needs from existing residents.

- A latent demand for 2445 dwellings (71 for Onslow). This includes populations outside the region whose residence in the Pilbara region is constrained by a lack of available housing.
- A future demand of 1014 dwellings across the region in a low growth scenario, 3037 and 4736 dwellings for medium and high growth scenarios respectively (3, 466 and 808 under low, medium and high growth scenarios respectively for Onslow).

Growth scenarios were adopted as follows:

- **Low growth:** Western Australian Planning Commission *WA Tomorrow* projected growth trends were applied to base year (2006) population estimate.
- **Medium growth:** Growth trends indicated by PICC forecasts were applied to the base year (2006) population estimate.
- **High growth:** The percentage difference between low and medium growth was added to the medium scenario. This was not adopted for Onslow; however, for the

Figure 21: 2006 Census weekly rent by landlord type (occupied private dwellings being rented<sup>(a)</sup>) – Onslow



(a) Excludes “visitors only” and “other not classifiable” households.

(b) Comprises dwellings being rented from a parent/other relative or other person.

(c) Comprises dwellings being rented through a “residential park (includes caravan parks and marinas)”, “employer-government (includes Defence Housing Authority)” and “employer-other employer” (private).

Source: Catalogue 2068.0 Census Tables – Weekly rent by landlord type, Australian Bureau of Statistics (2007)

period ending 2015 as growth percentages distorted the true extent of the increase. Instead, the nominal difference was calculated and added to the medium growth scenario.

The report also provides information on affordability, overcrowding and homelessness, and puts forward a number of recommendations to improve the quantity, quality and affordability of housing in the region. The study is yet to be published.

### 5.7 Onslow Townsite Strategy development scenarios

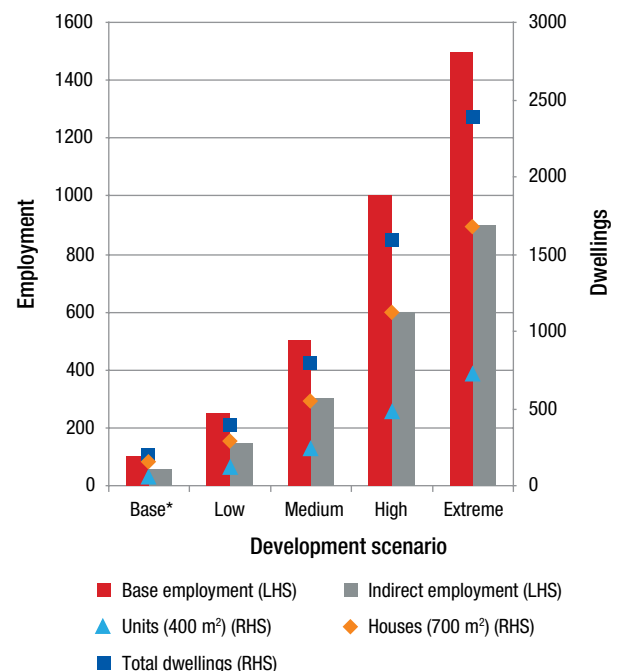
The *Onslow Townsite Strategy* investigates various urban growth scenarios based on development of the ANSIA by multiple users. Estimates of demand for residential land and housing have been prepared based on a number of scenarios (the scenario and assumptions are detailed in section 4.2 of this report). These estimates are listed in Table 12 and shown graphically in Figure 22.

Based on the anticipated development of the ANSIA and the Shire's position on FIFO (that is an expectation that operational staff will be located within the townsite), a medium to high development scenario is anticipated. Assuming a medium to high development scenario eventuates, it is calculated that more than 750 new base jobs and 450 indirect jobs would be established, generating demand for 1200 additional dwellings in Onslow.

Using an average of 2.2 persons per dwelling, this would result in a population increase of 2640 persons.

It should be noted that the Shire of Ashburton has adopted a more lenient position with regard to FIFO work practices for the Wheatstone project and is accepting of a 75 per cent FIFO workforce in that instance.

Figure 22: Onslow Townsite Strategy development scenarios



Source: Onslow Townsite Strategy Background Report, Shire of Ashburton (2010)

Table 12: Development scenarios – Onslow Townsite Strategy

Scenario	Base employment	Indirect employment	Household formation		Housing demand		Total dwellings	Gross residential land (ha)
			Single 30%	Family 70%	Units 400 m²	Houses 700 m²		
1: Base	100	60	48	112	48	162	210	22.10
2: Low	250	150	120	280	120	280	400	40.67
3: Medium	500	300	240	560	240	560	800	81.33
4: High	1000	600	480	1120	480	1120	1600	162.67
5: Extreme	1500	900	720	1680	720	1680	2400	244.00

Source: Onslow Townsite Strategy Background Report, Shire of Ashburton (2010)

Note: Base case scenario includes a need to cater for a latent demand for 50 houses (that is 160+50)

## 5.8 Housing demand scenario based on State Government employment/population forecasts

Understanding and planning for accommodation needs in Onslow is complex. Care needs to be taken in identifying housing demand based on scenarios when there are so many variables and assumptions involved in the calculations.

The quantum, design type and permanency of structure and tenure require more detailed assessment that would be better addressed through a local housing strategy.

In order to provide a high level guide to demand potential, the following housing demand scenario has been devised using employment forecast figures supplied State Government agencies. The forecast is based on assumptions outlined in section 4.1 of this report.

Aside from the purpose-built FIFO camps, a need for an additional 676 dwelling units is expected by 2017. Based on assumptions regarding the family or single status of workers, this would equate to 495 dwellings for families and dwellings units to accommodate 181 single workers (Table 13).

This is further detailed in Table 20 in section 6.8 of this report together with forecast dwelling requirements beyond 2017.

**Table 13: Forecast additional dwelling unit requirements (family/single/FIFO)<sup>1</sup> – 2011 to 2017**

	2011	2012	2013	2014	2015	2016	2017	Total
Latent demand - family dwelling units <sup>2</sup>	21	0	0	0	0	0	0	21
Latent demand - single dwelling units <sup>2</sup>	9	0	0	0	0	0	0	9
Natural growth - family dwelling units <sup>2</sup>	3	3	3	3	3	3	3	21
Natural growth - single dwelling units <sup>2</sup>	3	3	3	3	3	3	3	21
Workers - family dwelling units <sup>3</sup>	29	37	43	21	16	1	306	453
Workers - single dwelling units <sup>3</sup>	10	15	14	6	5	1	100	151
FIFO operational workers - beds <sup>4</sup>	0	0	20 (Macedon)	0	0	0	225 (Wheatstone)	245 (2 separate camps)
<b>Total family dwelling units</b>	<b>53</b>	<b>40</b>	<b>46</b>	<b>24</b>	<b>19</b>	<b>4</b>	<b>309</b>	<b>495</b>
<b>Total single dwelling units</b>	<b>22</b>	<b>18</b>	<b>17</b>	<b>9</b>	<b>8</b>	<b>4</b>	<b>103</b>	<b>181</b>
<b>Total FIFO beds</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>225</b>	<b>245</b>

Source: Based on data supplied by the Department of State Development, Department of Planning and LandCorp (2011)

1 Total dwelling unit requirements for Onslow townsites only (does not include ANSIA based construction workers). Further detailed planning will determine residential densities of individual sites and ultimate lot requirements.

2 Assumes 70/30 family/singles ratio.

3 Includes operational, indirect, consequential and non-specific contract workers associated with the Macedon, Onslow Salt expansion and Wheatstone projects. Data for 2017 also includes non-specific contract workers for second LNG, ammonia/urea, ammonium nitrate and methanol projects (construction forecast to commence in 2017).

4 Include FIFO camps for Macedon and Wheatstone projects only (does not include 750 person camp for contract workers not directly associated with resource projects such as road construction and infrastructure upgrades).

## 5.9 Demand for transient workforce accommodation

Due to the magnitude and skill sets required of construction workforces associated with development of the ANSIA, these workers will need to be brought in from other major centres. Based on an assumption that 75 per cent of the operational workers for Macedon, Wheatstone and other major projects will be FIFO, transient workforce accommodation (TWA) will be required not only for all construction workforces, but also potentially up to 75 per cent proportion of all project operational workforces.

There is a difference; however, in the location and permanency of the TWA required for construction versus operational workforce accommodation. Construction workers involved with the development of the ANSIA need to be located within the ANSIA area for logistical reasons and their use of the accommodation facilities will vary over time. Operational transient workers are expected to reside within the townsite and their accommodation will be of a permanent occupation nature. Locating the operational TWA in town rather than being based at the ANSIA is in accordance with the Shire of Ashburton *Local Planning Policy 13 – Transient Workforce Accommodation* (further discussed in section 6.9).

It should also be noted that the Shire of Ashburton does not generally support a blanket FIFO split for operational workers as high as 75 per cent and will consider each proposal on its individual circumstances.

### Summary of transient workforce accommodation needs

- **Macedon:** up to 300 construction workers require temporary TWA in the ANSIA from 2011 and 12 operational FIFO workers require permanent TWA in town by end of 2013.
- **Wheatstone:** 3000-5000 (4300 at peak advised by Chevron Australia, May 2011) construction workers require temporary TWA in the ANSIA between 2011-2017 and 225 operational FIFO workers require permanent TWA in town by the end of 2016.
- **Onslow Salt expansion:** No figures have been identified for construction workers; therefore, temporary TWA details are unknown but not expected to be high given the nature of the industry. All additional Onslow

Salt operational workers and their families will live in permanent housing within the town (no FIFO), so no TWA will be required for this.

Beyond 2017, demand is less certain. A second LNG facility is likely to generate similar demands to those outlined for the Wheatstone project for construction and operational workforce TWA. While it is more likely that higher proportions of operational workforces for downstream industries will be permanently residentially based, construction workforces are still likely to be temporary and require TWA.

Demand principles based on 100 per cent of the construction workers based in the ANSIA and 75 per cent of the operational workers being based in TWA in town for other projects that may eventuate, such as a second LNG plant and downstream processing industries have the potential requirements beyond 2016 as follows:

- **Second LNG plant:** 3000-5000 construction workers require temporary TWA in ANSIA from 2017-2021 and 225 operational FIFO workers require permanent TWA in town by 2022.
- **Ammonia/urea plant:** up to 500 construction workers require temporary TWA in ANSIA from 2017-2021 and 60 operational FIFO workers require permanent TWA in town by 2022.
- **Ammonium nitrate plant:** up to 500 construction workers require temporary TWA in ANSIA from 2017-2021 and 45 operational FIFO workers require permanent TWA in town by 2022.
- **Methanol plant:** up to 500 construction workers require temporary TWA in ANSIA from 2017-2021 and 38 operational FIFO workers require permanent TWA in town by 2022.

The Shire of Ashburton suggests that there is a possible demand for additional TWA for 750 people that has not yet been accounted for. Other proposed and imminent development in the town includes (but is not limited to) such activities as upgrades to utility infrastructure, upgrading and realignment of Onslow Road, development of industrial land at the airport, development of industrial land at Beadon Creek Maritime Facility, new housing projects, underground power works and coastal studies. Most of these activities will attract labour from out of town and will

increase the demand for accommodation on a temporary basis. Further investigation is required in terms of quantifying this demand, identification of potential sites for such facilities, costs/management of facilities and possible funding sources.

The draft structure plan for the ANSIA involves provision of a 300 ha site for TWA identified as part of stage 1A to be used only by construction workers involved with the Chevron Australia project. Although not assessed in the foundation proponent's Environmental Impact Statement/Environmental Review and Management Program, detailed investigations are being undertaken for relevant development plans for a second TWA site south of Chevron Australia TWA site. This is anticipated to accommodate construction workers involved with development of other future industries and is expected to be developed as stage 1B. Planning for town-based TWA is currently active only for the Wheatstone and Macedon projects and sites are still to be determined and developed.

## 5.10 Demand for service worker accommodation

Inclusive within the town-based permanent dwelling demand is those workers (and some with families) who are expected to locate in Onslow as a flow-on effect of economic opportunities generated by the commencement of the major resource projects.

A number of these workers will not be enumerated to the same high level of those employed by resource companies, nor will they enjoy subsidised accommodation rentals.

In order to attract and retain these important service workers who support the day to day functioning of a community, it is likely that purpose-built service worker accommodation is needed at least in the initial stages of development and operation of the major projects. Similar projects are being undertaken in other regional settlements funded through the Royalties for Regions program. The Shire of Asburton has advised that limited accommodation for key service workers is already impacting the town which could affect the short term viability of some small businesses in the area.

Further investigation and analysis will be required to measure the likely need of this type of accommodation.

## 5.11 Demand for State Government housing

The Department of Housing (DOH) currently has 35 social housing dwelling units in Onslow, with the majority being three bedroom dwellings (Table 14). As at May 2011, there were 26 households on the waiting list for social housing (23 family households and three single households). A contract has been let by the Department of Housing for the construction of three grouped dwellings (three bedroom). It is anticipated that the dwellings will be completed in the short term.

As at May 2011, the DoH had 22 Government Regional Officers' Housing (GROH) dwellings in Onslow (Table 14). No outstanding demand was reported. Based on a population forecast scenario of 2200 in 2016 and considering data from similar sized towns, the Department of Housing has advised of a possible requirement of 31 additional GROH houses.

As part of the Royalties for Regions initiative, GROH delivered 300 dwelling units throughout regional WA (including the Pilbara) up to July 2011 and aims to deliver a further 100 by December 2011. GROH is actively seeking opportunities to secure land for further construction projects in Karratha, Port Hedland and Tom Price.

House and land prices and rentals are likely to continue to increase as properties become less available at least in the short term, which may place additional pressure on DoH accommodation. Furthermore, as the town's population grows

**Table 14: Department of Housing dwelling stock (social and GROH housing) – Onslow**

Household Type	Two bedrooms	Three bedrooms	Four bedrooms	Total
<b>Social housing</b>				
Family houses	4	15	1	20
Singles houses	0	15	0	15
<b>Total</b>	<b>4</b>	<b>30</b>	<b>1</b>	<b>35</b>
<b>GROH housing</b>				
Family houses	4	16	2	22
Singles houses	0	0	0	0
<b>Total</b>	<b>4</b>	<b>16</b>	<b>2</b>	<b>22</b>

Source: Department of Housing (2011)



there will be greater demands for government officers' housing (for example teachers, police and health). DoH is responsible for accommodating most of these workers through GROH; however, it is noted that WA Health currently manages its own housing stock in Onslow and health projections and needs are not included in DoH numbers. Additional dwellings will be constructed in response to demand. Contribution towards funding houses for government services employees has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project.

### 5.12 Demand for industrial land

Many factors influence demand for industrial land, and quantifying this demand is a complex process. The demand for industrial land generally derives from a local, national or international demand for goods and services, with value adding to both locally generated products and products generated in other regions. The *Industrial Land Needs Study* identified industrial land supply and demand cycles as having three main drivers, summarised as follows:

- **Population and settlement growth**

Increased population growth and labour force participation rates equating to more jobs and increased demand for industrial land (20 per cent of jobs across the State are likely to be in the industrial sector).

- **Economic growth and decline cycles**

High levels of economic growth and productivity will result in an increased demand for land for industrial activity. This is particularly true for the Pilbara region, given the contribution of the resource industry to the economy of the region.

The cyclical nature of economic growth can make short-term predictions difficult; therefore long-term predictions provide the best indication of demand.

An additional supply (land bank) of 25-30 per cent above the long-term requirements should be allowed to create flexible market choice, respond to short-term hyper growth situations and for emerging and inward investment opportunities.

- **Location criteria and market preferences**

Industries will seek sites with sufficient amenity and location advantage in order to perform their activity in a competitive way (for example proximity to services, proximity to transport such as roads and ports, protected and buffered sites, and sites where industry is able to expand).

When land is in short or limited supply, industries may be forced to limit expansion plans, seek alternative sites (interstate or overseas) or cease trade altogether. Industry may also experience increased levels of competition from all land uses, particularly retail and commercial uses.

No detailed analysis has been undertaken to determine the demand for industrial land in Onslow, although if resource development projects proceed, additional land will be required for support industries, and the building and construction industry. The draft Ashburton North Strategic Industrial Area Analysis of Infrastructure and Key Issues report (unpublished) makes reference to a possible need of 180 serviced general/transport/industry lots by 2015.

Responses to LandCorp's Regional Industrial Land Demand Survey conducted in late 2010, indicated that seven businesses were looking to purchase industrial land in Onslow over the period 2011 - 2013. Three of the business indicated they were seeking light industrial land, two sought general industrial land with one business each seeking heavy industrial and commercial land. In terms of lot size, three businesses were seeking lots of less than 5000 m<sup>2</sup>, three 5000 - 9999 m<sup>2</sup>, and one business sought a lot between 1 - 4.9 ha.

An extension to the existing industrial estate has been proposed as part of the *Onslow Townsite Strategy*. This area is quite constrained and, if developed, would potentially yield only a small number of lots. Rezoning processes have commenced and expressions of interest (to determine land use needs) have recently been called for a proposed mixed business/light industrial estate at the airport (on local government owned land). It is intended that these lots would accommodate freight logistics, commercial and light industrial type uses. The DoT is also currently negotiating the release of additional lease sites at the Beadon Creek Maritime Facility for the purposes of marine and harbour related services. It is possible that industrial land in

addition to what is currently available or being planned may be required.

Demand for strategic industrial land will be met by development of the ANSIA, 11 km southwest of Onslow. The 8000 ha estate is large enough to accommodate major LNG developments and other prospective industry. The site also has ample room for future development (stage 2). Land within the ANSIA has been earmarked for Chevron Australia's Wheatstone project and BHP Billiton Petroleum/Exxon Mobil's Macedon and Scarborough projects. The State is progressing detailed planning for the site, including a port precinct and multi-user facilities on the coastal strip, and multi-user infrastructure corridors. Planning for a general industrial estate (located within the stage 2 area) is also being progressed by LandCorp.

### 5.13 Demand for commercial/retail floor space

Demand for retail/commercial floorspace is influenced by the following factors:

- population (resident, FIFO and visitors)
- expenditure (resident, FIFO and visitor expenditure)
- retail turnover (turnover per square metre of floorspace)
- employment structure (industry type and floorspace (m<sup>2</sup>) per employee)

Onslow currently has a large area zoned for commercial/retail uses (Commercial and Civic Zone), but has few businesses operating. A substantial proportion of the commercial lots along the waterfront and Second Avenue are either developed for single residential purposes (non-conforming use) or vacant.

A small number of business enterprises are operated by residents from their homes to complement existing town facilities including hair and nail salons, souvenirs and canvas supplies. Anecdotal evidence suggests that there is currently very strong demand for rental of quality commercial premises. For example the Shire of Ashburton rents out an office space at the Onslow Multi-Purpose Centre for more than \$2000 per week and has reported numerous enquiries regarding the availability of commercial premises in the town.

While no formal analysis has been undertaken, with the anticipated development of resource projects in the area and an increase in temporary and permanent residents, demand for commercial and retail facilities and land in a less constrained location will likely increase. An alternative location has been identified in the *Onslow Townsite Strategy*. This land is impacted less frequently by severe weather events and is therefore more likely to be developed and maintained. Townsite structure planning will determine the future use of this alternative site. Preparation of a commercial/retail strategy may also need to be considered to determine commercial/retail floorspace requirements in line with various population scenarios.

As part of the Pilbara Cities blueprint, a major townsite development and revitalisation focus will be placed on Onslow (in addition to South Hedland, Tom Price and Newman). Demand for commercial/retail floorspace in the town requires further investigation and the location and extent of the key commercial/retail focus for the town centre needs to be identified in relation to the overall townsite structure plan.

### 5.14 Demand for tourist accommodation

#### North West visitor summary

In the 12 months to March 2011, WA's North West, which encompasses both the Pilbara and Kimberley regions, had an estimated 512,200 visitors. The figure was up on the previous year with visitors of 498,200 in 2010.

#### Shire of Ashburton

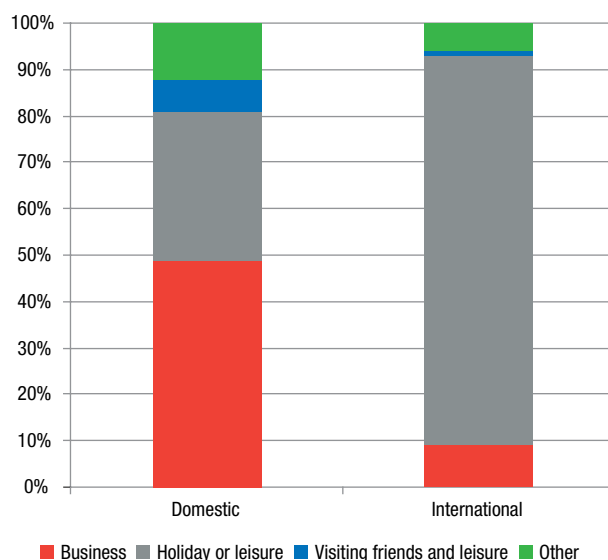
Data collected by Tourism WA show that the leading purpose of visit to the Shire of Ashburton for domestic visitors was business (49 per cent) and holiday or leisure (32 per cent). The holiday or leisure purpose of visit was prominent among international visitors (83 per cent). These data are shown in Figure 23.

Data for the Shire of Ashburton indicate that domestic visitors average 4.9 days and international visitors 6.3 days for the same period. Average annual visitors are shown in Figure 24.

Data collected by the ABS indicate an average occupancy rate for the Shire of Ashburton of 61 per cent for hotels, motels, serviced apartments in the March quarter 2011. Further detail is provided in section 6.13. Other Pilbara towns have experienced a decrease in the availability of short-stay accommodation over recent years due to housing supply shortages, with resource company employees or lower paid service workers occupying much of this accommodation. This results in visitors experiencing difficulties in securing affordable accommodation, requiring them to book months in advance of their stay.

Research by the Tourism Forecasting Committee shows the annual growth rate for visitor nights in regional Western Australia (areas excluding Perth) was -1.2 per cent for the period 2000-2009. Total visitor nights in regional WA are predicted to decline by 0.3 per cent each year between 2009 and 2014 before increasing 1.0 per cent annually between 2014 and 2020. The forecast growth rate in visitor nights for regional Western Australia for the period 2009-2020 is 0.4 per cent per year which is less than that of the Perth metropolitan region at 2.6 per cent.

**Figure 23: Purpose of visit to the Shire of Ashburton visitors 2008/09/10<sup>1</sup>**



<sup>1</sup> Based on visitor numbers averaged over 2008/09/10. Purpose of Visit is a multiple response question. Totals may not add up to 100 per cent.

Source: Shire of Ashburton Overnight Visitor Fact Sheet (Years Ending December 2008/09/10), Tourism WA (2011).

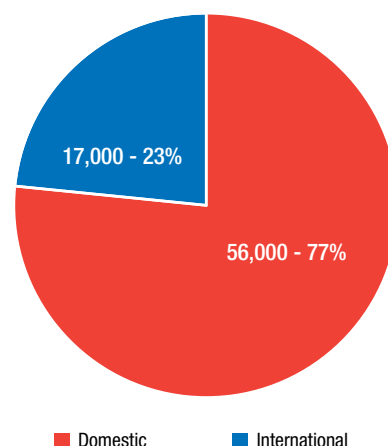
Development of tourism in Western Australia relies on the provision of appropriate infrastructure, which services the needs of tourists and encourages investment by the private sector in the tourism sector. Tourism WA facilitates infrastructure development through the preparation of *Tourism Development Priorities*, which identify key infrastructure projects for tourism development across the State.

### Onslow

Data available for the Shire of Ashburton may not necessarily be reflective of past trends in Onslow. Until recently, Onslow has not had the same pressures on tourist accommodation facilities as the inland towns of the Shire of Ashburton which have been brought about by increased demands of resource development. This may be about to change for Onslow, with the development of the ANSIA.

The Shire of Ashburton recently adopted its *Tourism Destination Development Strategy*. In relation to Onslow, the strategy acknowledges Onslow and its surrounding coast as a potential stand alone destination. It states that tourism will need to compete with demands created by resource and energy projects for limited

**Figure 24: Shire of Ashburton visitor nights, annual average visitors 2008/09/10**



Source: Shire of Ashburton Overnight Visitor Fact Sheet (Years Ending December 2008/09/10), Tourism WA (2011).

Data sourced from Tourism Research Australia's National and International Visitor Surveys.

accommodation and services. In the short term, tourism to Onslow may be difficult to develop as major resource projects overshadow typical visitor activities; however, the long-term outlook is promising with potential to develop a destination brand focused mainly of coastal and fishing activities. Upgrade of the Onslow airport would be a major stimulant to air travel arrivals servicing the needs of both business and leisure travellers to the region.

The Onslow visitor centre is managed and operated by a local committee and receives part funding (\$45,000 per annum) from the Shire of Ashburton. Activities within and surrounding the Onslow townsite include history (Old Onslow townsite), boardwalk and heritage trail walks, birdlife, on and offshore fishing, museum, termite mound viewing and the Ashburton River. Strong Indigenous cultural heritage exists; however, this is yet to be delivered successfully into tourism markets.

In the past 12-18 months, the Shire of Ashburton has granted planning approval to three separate developments totalling 29 additional holiday accommodation units; however, these are yet to be constructed. In addition, the Mackerel Island Holiday Village has recently undergone expansion with the construction of an additional 20 unit two storey development. Stage 2 of this expansion including another 28 units has been approved and is expected to commence within the next two years. Longer-term plans include the development of 30 more units.

#### Land and housing demand — for more information see the following links:

Australian Bureau of Statistics: [www.abs.gov.au](http://www.abs.gov.au) see Building Approvals Catalogue 8731.0 Building Approvals, Australia, Catalogue 2001.0 - 2006 Census Community Profile Series, Onslow (urban centre/locality) and Ashburton (local government area)

Australian Housing and Urban Research Institute: [www.ahuri.edu.au](http://www.ahuri.edu.au) see Housing market dynamics in resource boom towns (July 2009)

Pilbara Development Commission: [www.pdc.wa.gov.au](http://www.pdc.wa.gov.au) see Housing and Land Snapshots

Real Estate Institute of Western Australia: [www.reiwa.com.au](http://www.reiwa.com.au) see Regional Centres Profile

Shire of Ashburton: [www.ashburton.wa.gov.au](http://www.ashburton.wa.gov.au) see Onslow Townsite Strategy

Tourism Western Australia: [www.tourism.wa.gov.au](http://www.tourism.wa.gov.au) see Research and statistics

## 6 Land and housing supply

### Key points

- There is currently approximately 94 ha of undeveloped residential zoned land in Onslow. Much of this land however, is not available for immediate development due to the need to resolve planning, tenure, environmental and infrastructure development constraints. *The Onslow Townsite Strategy* identifies a total of 140 ha for future urban uses. Further detailed planning will be required (structure planning, scheme amendments and subdivision approvals) before land can be made available for housing and development.
- The timeframes required to resolve development and infrastructure issues in Onslow indicate that significant additional land for housing may not become available in the short term. This is a significant concern given the existing very low level of land and housing currently available to the market.
- Capacity of essential services (particularly water, power and wastewater) is extremely limited and in some instances is unable to meet service demands of existing development and zoning. Upgrades to infrastructure are required to address latent demand and support short term natural growth, as well as to meet potential demand scenarios. This will require significant investment.
- The existing industrial estate is fully utilised and additional land will be required in the short to medium term to support anticipated resource development and growth in Onslow. Projects are progressing to develop general and strategic industrial land at the ANSIA, marine support/ service industrial land at Beadon Creek and mixed business/light industrial at the Onslow airport.

- Given the current high cost of housing and lack of available rental accommodation, consideration may need to be given to the establishment of affordable accommodation for service and contract workers in the short term.
- There is a need for a more diverse range of housing in the town including more medium and higher density dwellings and affordable accommodation for key service workers, aged and other low income earners.
- Few building companies are currently active in Onslow, resulting in a limited choice of housing. There may be a need to develop incentives or strategies to attract additional builders and suppliers to Onslow.

### Actions and priorities

- Finalisation of townsite structure planning and coastal vulnerability work is required in order to progress more detailed local planning and development.
- Investigate and identify future commercial/retail and industrial land needs.
- A detailed local housing strategy is required to assess varying housing needs (including such factors as numbers, design mix/types and level of permanency of tenure and structure) together with integrated plan of delivery involving the private, public and community sectors.
- Native Title negotiations are progressing; however, there is a need to clear additional land for future development.

Identification of needs and delivery of land and housing is complex and particularly challenging in regional areas where development of resource projects and strategic industries can have major impacts on the physical and social fabric of existing communities.

It is impossible to plan an ideal supply-meets-demand outcome due to the many variables that affect both measurement of demand and the ability to supply land and the built form. These variables increase in stability as projects become more certain, policy makers define parameters of development and investigation and as studies and planning become more detailed.

The following information outlines some of the factors that need to be considered when investigating land and housing supply and identifies how these may influence or restrict the quantum and timing of supply. Existing and planned land and housing supplies are shown in a timeline against the demands generated by the population and employment scenarios prepared by DSD, DoP and LandCorp. From this, any shortfalls can be identified, thus informing where efforts need to be increased (by a range of stakeholders) to achieve better supply outcomes.

## 6.1 Issues affecting delivery of land and housing to market

Many issues affect the delivery of land and housing to the Onslow market. These can be summarised as follows:

- inadequate capacity in potable water, wastewater, energy and power distribution networks is affecting the release of residential, commercial and industrial land. Agency capital works programs may need to be revised.
- Indigenous heritage and Native Title issues.
- clearance under the Mining Act enabling Crown land to be released for development.
- floodplain and storm-surge development requirements.
- lack of short-term accommodation for contractors and builders.
- issues with population estimates and determining agreed land supply requirements. Agreed growth rates are required to assist infrastructure agencies with their forward planning.
- difficulties and long timeframes associated with progressing government approvals. The Ministerial Taskforce on Approvals, Development and Sustainability is investigating these issues and developing initiatives to address these problems.

## 6.2 Planning context

### State and regional planning

#### State Planning Strategy (1997)

The 1997 *State Planning Strategy* provides a strategic guide for land use planning through to the year 2029, Western Australia's bicentenary. The strategy is aimed at developing a land use planning system to help the State achieve a number of key goals. These include generating wealth, conserving and enhancing the environment, and building vibrant and safe communities for the enjoyment of current and future generations of Western Australians.

The *State Planning Strategy* is currently being reviewed, with a draft due to be released for public comment in 2011. The draft strategy will provide a basis for coordinating urban and regional land use planning, development and infrastructure. It will guide government departments and trading enterprises plus local governments on those matters. The strategy enables and facilitates decisions across government, embracing the State strategic directions of global competitiveness, strong and resilient regions, integrated infrastructure networks, liveable communities, responsive built environments and conserved natural environments.

#### State planning policies

State planning policies are prepared and adopted by the Western Australian Planning Commission (WAPC) under statutory procedures set out in part 3 of the *Planning and Development Act 2005*. These policies are concerned with broad planning controls and can be made for matters which may be the subject of a local



planning scheme or which relate to a specific region or area of the State. Examples include State policies for coastal planning, rural land use planning, and residential design codes (R-Codes). The WAPC and local governments must have due regard to the provisions of state planning policies when preparing or amending local planning schemes and when making decisions on planning matters. Further information can be accessed at the Department of Planning's (DoP) website, [www.planning.wa.gov.au](http://www.planning.wa.gov.au).

### Blueprint for Pilbara Cities (2009)

The State Government's Pilbara Cities initiative is designed to encourage more people to live and settle in the Pilbara. The Pilbara Cities blueprint provides a framework to transform the region by creating modern higher density centres, supported by infrastructure and amenity upgrades and improvements. The blueprint includes proposals for major revitalisations of South Hedland, Karratha, Newman, Dampier, Tom Price and Onslow town centres, in addition to plans to create new marinas and improved waterfronts at Port Hedland, Dampier and possibly Onslow. New infrastructure and facilities such as schools, TAFEs, medical facilities, leisure and entertainment facilities and retail precincts are also part of the plan.

Critical to the success is the attraction of new residents and businesses not involved in the region's traditional sectors of oil, gas and mining, creating places where people choose to settle on a permanent basis with access to high standards of services. The private sector is expected to play a crucial role in achieving the plan, including assisting with the delivery of affordable accommodation solutions by the release of development sites and superlots for land and housing, including opportunities in the private rental market. For further information see the Pilbara Cities website, [www.pilbaracities.com](http://www.pilbaracities.com).

### Pilbara Planning and Infrastructure Framework (2011)

The *Pilbara Planning and Infrastructure Framework*, prepared by the WAPC, defines a strategic direction for the future development of the Pilbara region over the next 25 years. It addresses the scale and distribution of future population growth and housing development as well as identifies strategies for dealing with: economic growth, environmental issues, transport, infrastructure, water resources, tourism and the emerging impacts of climate change. It seeks to ensure that development and change in the

Pilbara region is achieved in a way that improves people's lives and enhances the character and environment of the region.

The Framework sets out regional planning principles together with goals, objectives and actions to achieve these. The strategy also addresses the Pilbara's priority infrastructure needs over the next five years.

The Framework represents an agreed "whole of government" position on the broad future planning direction for the Pilbara and will guide the preparation of local planning strategies and local planning schemes. It will be particularly important in informing government of infrastructure priorities in the Pilbara and giving the private sector confidence to invest in the region.

### Pilbara Framework: Regional Profile (2009)

The *Pilbara Framework: Regional Profile*, prepared by the WAPC, provides a spatial planning profile for the Pilbara region. The document provides a background and rationale for the Pilbara Planning and Infrastructure Framework, which sets out the spatial strategic direction for the region. This will inform State Government investment in infrastructure and provide the context for local government planning in the region.

The document provides detailed information on the existing settlement structure within the region. The regional profile was released in August 2009.

### Pilbara Regional Water Plan 2010 - 2030 (2010)

Released by the Department of Water in June 2010, the *Pilbara Regional Water Plan 2010 - 2030* provides a strategic and long-term approach to sustainable water resource planning and management for the Pilbara region. The plan presents a strategic overview of the region's water resources and the major challenges facing the region, both today and in the future. Included in the document is an action plan which lists priority actions for water planning in the region for the next five years.

Actions included in the plan are intended to address the current shortage of regional, district and local water management plans and strategies that are necessary to guide future developments, and demonstrate the land's capability to support these developments from a water perspective.

## Better Urban Water Management (2008)

*Better Urban Water Management* provides guidance on the implementation of *State Planning Policy 2.9 Water Resources* and has been adopted as the State policy approach in integrating land and water planning and working towards water-sensitive urban design. This approach was collaboratively developed by the Department of Planning and Infrastructure, Department of Water, the Western Australian Local Government Association and the Australian Government Department of Environment, Water, Heritage and the Arts.

*Better Urban Water Management* is designed to facilitate better management and use of water resources by ensuring an appropriate level of consideration is given to the total water cycle at each stage of the planning system. The document intends to assist regional, district and local land-use planning, as well as subdivision phases of the planning process. The document is to be used by all stakeholders and decision makers and has statewide application for new urban, commercial, industrial and rural residential developments.

## Local planning

### Onslow Townsite Strategy (2010)

The Shire of Ashburton, with assistance from DoP and LandCorp has prepared the *Onslow Townsite Strategy*. The strategy aims to address a range of issues impacting on the town's wellbeing, including land availability and the need to upgrade community and physical infrastructure within the town. The *Onslow Townsite Strategy Background Report* (2010) was prepared in conjunction with the strategy to provide supporting material and a rationale for the strategy, providing a framework for sustainable development of Onslow.

This strategy supersedes the *Onslow Structure Plan* published in 2003. A draft review of the structure plan commenced in 2006 to address implications of the development of gas processing in the strategic industrial area south of the town; however, this has since been replaced by the *Onslow Townsite Strategy* and the associated planning work currently being undertaken for the ANSIA.

The *Onslow Townsite Strategy* was adopted by the Shire of Ashburton in May 2010 and endorsed by the WAPC in March 2011.

## Shire of Ashburton Town Planning Scheme No. 7

Local planning schemes set out the way land is to be used and developed. They classify areas for land use and include provisions to coordinate infrastructure and development in a locality. They also include controls to ensure long-term strategic planning objectives are achieved.

The *Shire of Ashburton Town Planning Scheme No. 7* relates to the entire Shire of Ashburton and was gazetted on 24 December 2004.

The general objectives of this scheme are to:

- facilitate development that responds to the character and amenity, geographical context and environmental constraints of the Shire and its urban and rural areas;
- provide areas available for urban development where there is a perceived potential for population growth and provide development standards for urban development;
- locate recreation, commercial and community services in central places within urban centres to maximise access and efficiency of infrastructure provision;
- respond to potential strategic industry and resource development;
- provide areas and development standards for local industrial and mixed business development;
- provide sites and development standards for recreation, community uses and public infrastructure, including infrastructure corridors for transporting multiple types of materials and energy of regional and State significance;
- identify the location and land requirements of roads within a defined State, regional and local hierarchy;
- allow the continued use of rural land for pastoral and other associated rural and remote uses, particularly rural settlements;
- identify areas for conservation, recreation and natural landscapes which are important for ecological, heritage and amenity purposes in addition to the major tourist assets of the Shire;

- facilitate development that takes account of the heritage value of places, buildings and objects;
- acknowledge the health risks within the Wittenoom townsite;
- facilitate development that has regard for the long term protection of natural resources, such as clean air, water, soil and biological diversity;
- facilitate the orderly development of *Onslow Structure Plan*; and
- assist in the effective implementation of regional plans and policies, including the *State Planning Strategy*.

A number of recently-gazetted scheme amendments and scheme amendments in progress (as at August 2011) will influence further development in Onslow. These include:

- **Amendment No. 9** (gazetted 21 December 2010): Established a special control area for the Ashburton North Strategic Industrial Area.
- **Amendment No. 10** (initiated 15 December 2010, advertised for public comment August 2011): Strategic Industrial Zone, Other Purposes Reserve – Infrastructure, Special Use Zone – Transient Workforce Accommodation.
- **Amendment No. 11** (initiated 15 December 2010, advertised for public comment August 2011): Rezone Pt Location 303 Onslow Road from Strategic Industrial Zone to Rural Zone and delete special control area.
- **Amendment No. 13** (initiated 22 September 2010, not yet advertised): Amend Clause 6.6 of the Scheme Text to allow increased density on lots coded R12.5 in certain circumstances
- **Amendment No. 14** (initiated February 2011, not yet advertised): Amend the zoning table in the Scheme Text to allow Transient Workforce Accommodation as an “A” use in the Commercial and Civic Zone.
- **Amendment No. 15** (initiated March 2011, not yet advertised): Rezone portion of Onslow airport site from Public Purposes Reserve – Airport to Mixed Business Zone, with “Airport” as a “D” use in the Mixed Business Zone (Precinct 1 as defined in the *Onslow Airport Master Plan*).

- **Amendment No. 16** (initiated March 2011, not yet advertised): Rezone portion of Onslow airport site from Public Purposes Reserve – Airport to Mixed Business Zone, with “Airport” as a “D” use in the Mixed Business Zone (Precinct 2 as defined in the *Onslow Airport Master Plan*).

### Ashburton North Strategic Industrial Area Structure Plan (draft)

The Shire of Ashburton initiated Amendment No. 9 to its town planning scheme in February 2010 (final gazettal December 2010) to classify the ANSIA as a special control area, thereby establishing clear criteria required to progress more detailed zonings and development. A structure plan for the ANSIA is a statutory requirement of that special control area to facilitate development.

A draft structure plan was developed in conjunction with Chevron Australia, the Shire of Ashburton, DoP, Environmental Protection Authority, DSD, LandCorp and Dampier Port Authority. The main features of the plan included stage 1A (Wheatstone LNG and domestic gas plant, common user coastal area, multi-user access and infrastructure corridor and Wheatstone TWA); stage 1B (Scarborough LNG plant, Macedon domestic gas plant, future industry area and a multi-user access and infrastructure corridor) and stage 2 (for longer term development with no current intentions).

In June 2011, the Shire of Ashburton resolved to adopt the draft structure plan subject to a number of modifications and commitments from Chevron Australia and the DSD supporting and underwriting the provision of social and hard infrastructure as identified or as negotiated. Modifications include an additional workforce accommodation site as part of stage 1B and general industrial lots as part of stage 1C.

In July 2011, the Shire of Ashburton resolved to advertise the draft structure plan for public comment for a minimum period of forty two days subject to a number of conditions. Once a structure plan is adopted for final approval, endorsement of the WAPC will then be sought.

The structure plan only spatially relates to the ANSIA area; however, development within this area will have significant impact on land and housing needs within the townsite area.

As a result of Amendment No. 9, Chevron Australia also prepared the *Ashburton North Strategic Industrial Area Service Infrastructure Report* (August 2010) and the *Ashburton North Strategic Industrial Area Social Impact Statement* (August 2010).

### Ashburton North State Development Agreements

The State Government and proponents wishing to establish projects in the ANSIA will enter into agreements that will provide a framework for managing the development and operation of their projects within the overall objectives of the State. These agreements, to be referred to as State Development Agreements (SDA), will focus on key issues including: specific details about land allocations, access through the ANSIA especially common-user and multi-user components, usage of the port and defining contributions for project, critical and social infrastructure within the ANSIA and will also include strategies to address impacts on the Onslow townsite.

A number of processes are rolled into the contents of the SDA, including: leases executed by Landcorp and the Port Facilities Agreement (PFA) between the Dampier Port Authority and proponent.

In regard to the Wheatstone project, a State Development Agreement (SDA) has been negotiated between the State Government and Chevron Australia. In relation to infrastructure, proponents have negotiated with the State in regard to project and critical service requirements (e.g. power, water and waste water) in the ANSIA and the Onslow townsite and with the Shire of Ashburton in regard to community and social infrastructure. Agreement on community and social infrastructure is also reflected in the SDA.

### Onslow townsite structure planning

LandCorp is undertaking comprehensive structure planning work for the greenfield area identified in the *Onslow Townsite Strategy* as well as investigating design requirements and infill opportunities for the townsite. The structure plan will guide residential and commercial expansion over this area and is anticipated to be completed in 2012.

As part of preparing the structure plan, a charrette planning exercise was held in Onslow in late July 2011 to assist with developing a way forward. A number of issues were tabled and investigated simultaneously to gain a better understanding of how the residential and commercial expansion of the town may occur.

The main issues raised at the charrette included:

- Population in Onslow is likely to significantly increase as a result of resource projects commencing at the ANSIA.
- Implications of coastal setbacks and storm surge and the heavy influence these will have in shaping the future development of the townsite.
- The need to determine an appropriate building height and number of storeys for development.
- More informal social spaces and services are required (e.g. coffee shops and meeting places).
- A need for building design and form that reflects the town's uniqueness while ensuring function.
- Provision of amenity, particularly along the foreshore, is required.
- Identification and utilisation of the foreshore as an important space for tourism.
- Parking will be a significant issue in the townsite.
- Additional services utility services (power/water/wastewater) are required as existing services are insufficient or at capacity.
- Impact and integration of operational workforce camps on the townsite.
- Provision of community services (e.g. aged care and child care) will be required to meet increased demand.

The charrette resulted in significant data being collected on a range of issues. This information will now be collated into a format that informs the structure planning process.

### Tourism Destination Development Strategy

The Shire of Ashburton has recently prepared a *Tourism Destination Development Strategy* (adopted March 2011). The strategy reviews current tourism investment and visitor-based programs and will assist the Shire in its planning for tourism development over the next five years. The strategy identifies key issues to be addressed by the Shire in order to achieve its full potential as a vibrant visitor destination, reporting on visitor servicing, marketing and destination promotion, and tourism investment.

### Onslow Airport Master Plan

In June 2010, the Shire of Ashburton endorsed the existing airport site as the preferred site for expansion and development. The *Onslow Airport Master Plan* was then prepared to review the operational requirements of the airport to meet future resource sector needs. With the airport site being largely undeveloped, the master plan also considers the development of surplus land associated with the airport to provide much needed mixed use/industrial land. In this regard, the master plan identifies development of 124 lots over two precincts for airport operations, freight logistics, airport commercial and light industrial uses.

The master plan was adopted by the Shire of Ashburton in November 2010. *Amendment No. 15 and No. 16* to rezone precincts one and two to mixed business were initiated in March 2011.

### Onslow Recreation Precinct Master Plan

A draft recreation precinct master plan has been prepared for the area including Thalanyji Oval, the Onslow Sports Club site and Reserve 42090. The draft plan currently depicts netball/basketball courts, tennis courts, skateboard park, a stage and amphitheatre, 25 m lap pool and additional leisure pool with associated kiosk and change room facilities, community centre, family barbeque area and various interpretive walking areas and artwork.

Development will be dependant on future tenure and management arrangements and council approval of a more detailed master plan, which is likely to involve further community consultation.

### Town centre revitalisation

The Pilbara Cities blueprint includes major town revitalisation at Onslow. In partnership with the Shire of Ashburton, LandCorp are in the initial stages of working on a plan for the town centre. It is anticipated that the project will include landmark developments to signal entrance to the town and improved connectivity and access to the commercial precinct. It is expected that plans will further develop following progress on the structure plan for the townsite and the outcome of coastal and foreshore studies.

### Shire of Ashburton local planning policies

Local planning policies are prepared to provide guidance on the preparation of development applications and to communicate the objectives of the Shire in relation to development and use of land. The Shire of Ashburton has prepared a number of policies which provide guidance on development requirements in various areas and assist with decision making for various land use proposals. Further information can be found on the Shire of Ashburton's website [www.ashburton.wa.gov.au](http://www.ashburton.wa.gov.au).

## 6.3 Coastal environment

Two significant storm-surge studies and foreshore investigations have been undertaken for the Onslow district. These are *Onslow Storm Surge Study* (Halpern Glick and Maunsell, 2000) and *Onslow Foreshore Investigations* (MP Rogers, 2002). During the review of the *Onslow Structure Plan* consultants GHD reviewed these studies together with two independent sources dealing with flood risk in the region. It was found that flood levels significantly varied between the different modelling and that the earlier modelling did not take into account the impact of global climate change.

Furthermore, Geoscience Australia and FESA conducted tsunami impact modelling for Onslow as part of providing *Professional Opinion 2007/07: Tsunami Impact Scenarios for the North West Shelf, Western Australia*. This report supported the emerging need to conduct more detailed modelling of the coastal processes impacting the Onslow coastline.

The *Onslow Townsite Strategy Background Report* also identifies the need to undertake additional coastal vulnerability assessment work for Onslow.

MP Rogers and Associates are currently carrying out a coastal setback and development level study for LandCorp on behalf of the Shire of Ashburton. This study will be used to guide planning decisions for the future use and development of the foreshore area and has been funded through the Northern Towns Development Fund.

A review of *State Planning Policy 2.6 State Coastal Planning* is under way. The need to raise finished floor levels may have a significant cost impact for development of projects within vulnerable coastal areas.

The Department of Conservation and Environment (DEC) has two main interests in the Onslow area:

- The Cane River, Mt Minnie Pastoral Stations and part of Nanutarra Station were purchased by the then Department of Conservation and Land Management in 1998. It is possible that these properties will receive appropriate conservation reservation and vesting in the future.
- The Onslow coastal strip, particularly east of Beadon Creek, contains mangrove communities that are not part of the DEC estate. Onslow is home to several species of mangroves and are considered integral to coastal and marine processes.

The environmental significance of the Beadon Creek mangrove communities will need to be considered in any future urban development of this area.

There is a small site of moderate to low risk acid sulphate soil on the northern tip of the Onslow townsite and this has implications for all forms of structures. The DEC is likely to require investigation prior to any disturbance occurring, as outlined in its draft *Identification and Investigation of Acid Sulphate Soils*.

## 6.4 Native Title and heritage

### Indigenous culture and Native Title

Onslow accommodates Aboriginal people from a number of groups originating from the inland Pilbara. In September 2008 it was determined that the Thalanyji people are the local Traditional Owners in the Onslow area. The *Aboriginal Heritage Act 1972* requires that management or research on Aboriginal sites be subject to permission under Section 16 from the Aboriginal Cultural Material Committee (an advisory body of the Minister for Indigenous Affairs). Permission is usually conditional upon the approval and involvement of the Aboriginal custodians of the site and on the input of a professional heritage conservator. Development of vacant land generally requires clearance under the Act.

Much of the area surrounding Onslow is subject to Native Title; however, developed areas in the existing townsite are exempt from the claim. *The Native Title Act 1993* was created to recognise and protect Aboriginal and Torres Strait Islander people's Native Title rights and interests. The amended Act constitutes to provide ways to determine Native Title and protect the existing rights of governments, industry and the general public. The Act also provides ways to negotiate future public works and business activity on land or waters where Indigenous people may have Native Title rights and interests.

It is important to involve and consult Onslow's Aboriginal community at the earliest possible stages of planning and development to identify and consider heritage places and land rights in a timely manner.

### European culture

There are a number of recorded heritage sites in the existing and old Onslow townsites and the surrounding area. An important heritage site is the Old Onslow townsite which is currently on the Heritage Council of Western Australia's Register of Heritage Places and is being considered for inclusion on the Register of the National Estate. A conservation plan has been adopted, providing guidance for the preservation and enhancement of the site. The plan has been adopted by the Shire as a policy. Given the site is in close proximity to the ANSIA, the site may come under increased pressure in the future. Peedamulla Homestead ruin is also listed on the Heritage Council's Register of Heritage Places.



Eight sites/buildings in Onslow are listed on the *Shire of Ashburton Municipal Heritage Inventory* including St Nicholas Church, the Beadon Bay Hotel and the Onslow Goods Shed/Museum. Several additional sites have also been identified in the area, which may be considered as part of a review of the inventory. It is important that the cultural landscape of Onslow's listed places be given due respect in the future planning of the town.

### 6.5 Role of LandCorp

LandCorp is Western Australia's government land development agency, acting commercially to identify, design and implement major land, tourism and infrastructure projects which have a lasting and positive impact for Western Australians.

Projects are statewide and fall into industrial, metropolitan and regional categories. LandCorp works with all levels of government and business on projects ranging from discrete residential subdivisions to the creation of whole new towns, industrial infrastructure and tourism development to support the long term growth of the State.

Principal services include:

- providing sufficient industrial land to assist the growth of WA's economy;
- urban development and renewal projects where unique opportunities or constraints exist;
- optimising triple bottom line outcomes from government-owned land;
- providing asset management and expert services to government; and
- supporting the growth of regional towns statewide by providing suitable land.

LandCorp operates with an independent board and is responsible to the Minister for Regional Development; Lands.

### 6.6 Role of Department of Regional Development and Lands

State Land Services within the Department of Regional Development and Lands is responsible for the administration, assembly and allocation of Crown land. Operating under the *Land Administration Act 1997*, the department:

- administers Crown land;
- conducts land assembly for government land;
- supports and advises other agencies in relation to government land tenure issues under the *Land Administration Act 1997*;
- provides advice and input on land solution over government land;
- liaises with LandCorp to complement the roles of the respective agencies; and
- sells Crown land to other government agencies, local governments and private customers.

The Department of Regional Development and Lands also delivers and oversees the Pilbara Revitalisation Plan funded under the *Royalties for Regions Act 2009*. The Pilbara Revitalisation Plan includes initiatives to provide housing for workers accommodation and sustainable housing for Aboriginals.

### 6.7 Role of Department of Housing

The Department of Housing (DoH), through the Housing Authority, assists the Minister for Housing in administering the *Housing Act 1980*, *Government Employees' Housing Act 1964* and the *Country Housing Act 1998*.

The Housing Authority is responsible for:

- creating social and affordable housing in Western Australia;
- setting policy and regulating community housing; and
- providing housing for State Government employees in regional and remote areas of the State.

Its primary role is to provide and support housing for Western Australians who cannot otherwise afford their own homes. The authority does this by offering affordable land and housing, assisting with housing finance, providing rental housing and supplying government employees in country areas with homes (Government Regional Officers' Housing – GROH). The GROH program plays a vital role in attracting and retaining key government workers in regional and remote communities, especially in areas which have a limited housing supply and lack a rental market.

DoH also administers the New Living program which currently involves the renewal of a number of public housing dominated areas across the State. This program aims to:

- reduce the public housing presence which dominated the area;
- refurbish houses for sale to the public or existing tenants;
- reduce the social stigma caused by the density of inappropriate and outdated public housing;
- upgrade and refurbish public rental housing;
- improve the social mix;
- improve the total area with streetscapes and parks to create a satisfied community; and
- encourage a sense of added security for local residents by eliminating areas which provided venues for anti-social behaviour.

DoH has a range of programs in place to assist Aboriginal people access rental housing and home ownership. This includes the provision of 2500 additional rental homes for Aboriginal people beyond the mainstream program, managed by the department. Also available are a range of counselling and support services, a targeted home loan scheme and various construction and housing initiatives for Aboriginal communities across the State.

The DoH has been developing an affordable housing strategy based on 53 recommendations made by the Social Housing Taskforce report (October 2009), which included such reforms as collaboration with the private sector, assigning housing via a needs register, and making greater use of community housing. The *Affordable Housing Strategy 2010 - 2020* was released in May 2011.

The strategy aims to provide affordable housing to West Australians with a delivery target of 20,000 additional new houses by 2020 through public and private partnerships.

## 6.8 Residential

### Existing dwelling stock

In general, Onslow's housing stock tends to be ageing and in relatively poor condition. Map 4 indicates the decade of construction for dwellings in Onslow.

Almost half of the occupied private dwellings in Onslow recorded in the 2006 Census were separate houses (Table 15). More than 200 "other dwellings" were also recorded. These include caravans, cabins or houseboats, tents or sleep outs, or houses or flats attached to shops and offices. Approximately 35 per cent of the occupied dwellings recorded in the census consisted of three or more bedrooms. At the time of the 2006 Census, the majority of dwellings in Onslow were rented (62 per cent), which is comparable to other settlements in the Pilbara region.

The Shire of Ashburton reports that the majority of new dwellings in Onslow are pre-constructed/transportable rather than built on site.

Significant housing stock owners in Onslow include Onslow Salt (39 dwellings), DoH social housing (35 dwellings), DoH GROH (22 dwellings), Bindi Bindi community (26 dwellings) and the Shire of Ashburton (7 dwellings).

The Pilbara Towns Housing Study (unpublished) advises that Onslow has a relatively high proportion of dwellings owned by government agencies, but has the second lowest level of resource company ownership for towns in the Pilbara and a commensurately high level of private ownership.

**Table 15: Census 2006 dwelling stock – Onslow**

Dwelling type	Number of dwellings
<b>Total private dwellings (including unoccupied private dwellings)</b>	<b>467</b>
<b>Occupied private dwellings</b>	<b>421</b>
Separate house	199
Semi-detached, row or terrace house, townhouse etc	0
Flat, unit or apartment	20
Other dwellings	202
Not stated	0

Source: Census 2006 QuickStats, Australian Bureau of Statistics (2007)

### Existing lots/lot size and additional lot potential

Areas zoned Residential or Urban Development in Onslow have a residential density code of R12.5 or R12.5/30 applied (R30 where reticulated sewerage is available).

Lot potential and average lot size for residential lots in Onslow has been assessed using the DoP's Integrated Land Information Database. The database is a net land use assessment and capability model that is generated at a cadastral level for the whole of Western Australia. In the case of split R-Codes the highest R-Code is used (that is maximum potential) to calculate additional lot and dwelling potential. It should be noted that this model does not take into account the position of the dwelling on the lot. Only limited outputs (Table 16) are available from this spatial model due to Valuer General's Office data being unavailable for the Shire of Ashburton at the time of preparation of the model in 2009.

The data indicate that there is potential for approximately 1000 additional lots if the existing zoned area was developed to its full potential (developed to maximum density). Additional infill development utilising existing infrastructure should be encouraged where possible.

*Amendment No. 13* was initiated in December 2010 to allow development of two grouped dwellings on lots greater than 875 m<sup>2</sup>, and development of grouped dwellings at maximum density of R30 on lots greater than 1500 m<sup>2</sup>. As at April 2011

there were nine vacant lots zoned Residential R12.5 which could potentially yield 18 dwellings if *Amendment No. 13* is supported and approved. However, a number of these lots sit adjacent to one another and therefore, if amalgamated, could be developed to a density of R30 (subject to approval of *Amendment No. 13*).

**Table 16: Integrated land information database outputs – Onslow**

Suburb	R-code	No. of lots	Lot potential (low) <sup>1</sup>	Lot potential (high) <sup>2</sup>	Average lot size (m <sup>2</sup> )
Onslow	R12.5	68	101	101	1489
	R12.5/30	179	474	1209	2819
<b>Total</b>		<b>247</b>	<b>575</b>	<b>1310</b>	<b>2453</b>

Source: Integrated Land Information Database, Department of Planning (July 2009)

1 Refers to additional lot potential at R12.5

2 Refers to additional lot potential at R30.

### Existing vacant lots

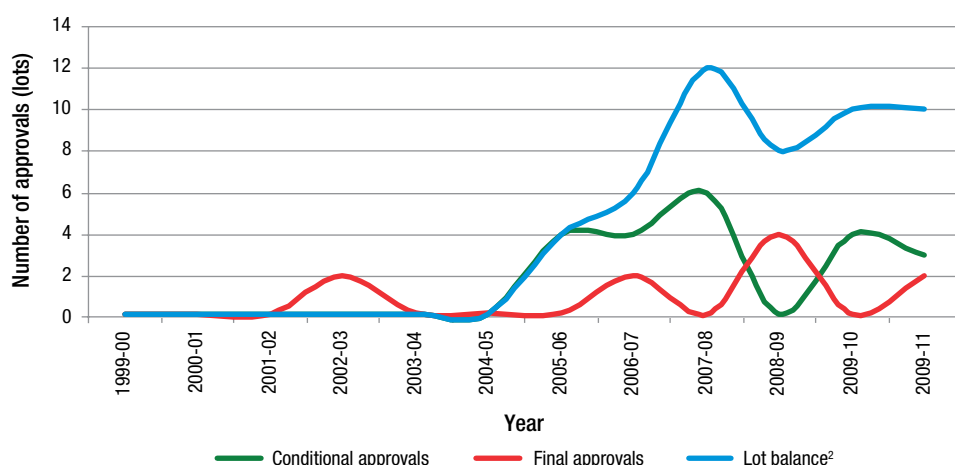
A survey conducted on 21 January 2011 by DoP revealed a total of 37 vacant lots in areas zoned Residential in Onslow. Twenty of these lots were owned by either private persons or commercial organisations, with the remaining lots owned by State (14 lots) and local government (three lots). Seven of the lots were undeveloped Crown reserves (for purposes of recreation, drainage and emergency services). Vacant residential lots are shown on Map 4.

In 2009, the Shire of Ashburton, Department of Planning and LandCorp identified vacant government owned land and reserves which were surplus to requirements. Some of these lots were made available to the market by LandCorp and have since been sold.

### Recent subdivision activity

Residential subdivision activity has increased in recent years, although it still remains at very low levels (Figure 25). At 30 June 2011, there were only 10 residential lots with conditional approval for subdivision. The last major subdivision took place in 1993 with the development of land at the southern extent of the townsite to house Onslow Salt employees. The majority of Onslow Salt dwellings were constructed over the period 1999–2001.

Figure 25: Residential conditional and final approvals<sup>1</sup> 1999/2000 to 2010/11 – Onslow



<sup>1</sup> Includes subdivision/strata approvals for the purposes of subdivision, amalgamation, boundary realignment, re-subdivision and road purposes.

<sup>2</sup> As at 30 June each year. Refers to conditional approvals for which construction or servicing has not yet commenced, or is currently under way (that is has not reached final approval stage).

Source: Approvals database, Department of Planning (2011)

## Residential zoned land supply

Data in Table 17 detail the area of developed and undeveloped residential zoned land in Onslow as at March 2011. The analysis focused on undeveloped greenfield areas and, as such, single vacant lots within the existing urban area have been classified as developed.

While there is a large area of undeveloped land zoned for urban development, this area is not immediately available for development due to the requirement to resolve a number of complex planning and infrastructure issues. Any additional development in the short term will most likely be a result of infill opportunities.

The *Onslow Townsite Strategy* identifies approximately 147 ha for future development (excluding areas identified for industrial uses), of which 81 ha is currently zoned Residential or Urban Development.

Map 5 identifies areas of unallocated Crown land and Crown reserves in and around Onslow.

Table 17: Residential zoned land supply – Onslow

Zone	Developed (ha)	Undeveloped (ha)	Total (ha)
Residential R12.5	9.3	0.4	9.7
Residential R12.5/30	15.9	0	15.9
Urban development R12.5/30	0	93.8	93.8
<b>Total</b>	<b>25.2</b>	<b>94.2</b>	<b>119.4</b>

Source: Internal databases, Department of Planning (2011)

## Rural living

Land immediately west of Onslow Road stretching approximately from the airport entry to opposite the Beadon Creek industrial area is zoned Rural Living. The area totals approximately 47 ha, of which few lots are developed (Table 18). The lots vary in size from approximately 2-7 ha and are predominantly undeveloped.

These properties are either general purpose Crown leaseholds, unallocated Crown land or Crown reserves. A number of properties are vested with the Shire of Ashburton for equestrian purposes, with the power to lease.

A large proportion of this land is identified in the *Onslow Townsite Strategy* for urban expansion. Some of this land is also affected by the Water Corporation wastewater treatment plant buffer and

the Bindi Bindi wastewater treatment plant buffer. Part of the Rural Living land also falls within a special control area which restricts building height due to proximity to the Onslow airport.

With the presence of the Onslow race track and the rodeo, the importance of maintaining a number of properties for rural living may need to be recognised and considered in future planning.

**Table 18: Rural living zoned land supply – Onslow**

Zone	Developed (ha)	Undeveloped (ha)	Total (ha)
Rural living	7.2	39.7	46.9
<b>Total</b>	<b>7.2</b>	<b>39.7</b>	<b>46.9</b>

Source: Internal databases, Department of Planning (2011)

### Residential land development pipeline

The residential land development pipeline detailed in Figure 26 presents data for key points of the land development process, from identification of land in strategic plans, through to subdivision and building approvals. Regular monitoring of the amount of land and approvals flowing through the pipeline will assist with identifying bottlenecks in the development process, and potential periods of over or under supply.

As at July 2011, there were few applications for subdivision flowing through the system with very few lots created and building approvals recorded over recent years. Given the timeframes associated with land development in Onslow (particularly the need to resolve development constraints) it may be some time before significant greenfield land can be made available for housing development.

### Residential land release

In summary:

- Land for residential expansion is available, but is subject to resolution of a number of complex planning and infrastructure issues.
- Development of residential infill sites is anticipated to commence in the short term. The development of housing on these sites will assist in addressing latent and short term demand.

- Significant additional development in Onslow will trigger the need for substantial upgrades to water, wastewater and power infrastructure. These services are currently operating near or above capacity.
- Development of greenfield areas (ONS01A - Map 6) could possibly commence in the short term; however, this is subject to further planning and approvals, and resolution of infrastructure issues.
- Development areas identified in the *Onslow Townsite Strategy* could accommodate the forecast employment/ population growth as outlined in section 4.1 of this document. This will depend on development densities and the extent of other land uses that are established within this area.

Land and dwelling release information is summarised in Table 19. Further project specific information is available in the project summaries table (Table 27) and land release plan (Map 6) at the rear of this document.

### Adequacy of supply

The potential additional dwelling requirement per year has been estimated as a result of employment modelling undertaken by State Government agencies. This is in addition to facilities needed to accommodate construction workforces (ANSIA based) and operational FIFO workers (town based). These data indicate an additional dwelling requirement of 676 dwellings (495 family and 181 single dwelling units) over the period 2011 to 2017 (see Table 13 and Table 20). It is anticipated that a further 659 dwellings (485 family and 174 single dwelling units) will be required beyond this time. This is based on assumptions detailed at the end of section 4.1 of this document. Approximately 60–70 additional dwellings will be required each year over the next three years (2011 – 2013).

Data presented in Table 19 indicate that if land is released and dwellings constructed as planned, supply may not meet demand in the short term. These deficiencies should however ease by the medium term; however, this will ultimately depend on how quickly greenfield areas can be developed and housing consequently constructed, and to what extent anticipated demand is realised.

Serviced land will need to be available for a considerable time before the dwellings are required to accommodate employees,

due to lengthy construction lead times. Depending on whether the dwellings are built on-site or pre-fabricated off-site, serviced land may need to be available up to one year or more before the dwellings are required, to allow time for construction and building approvals processes.

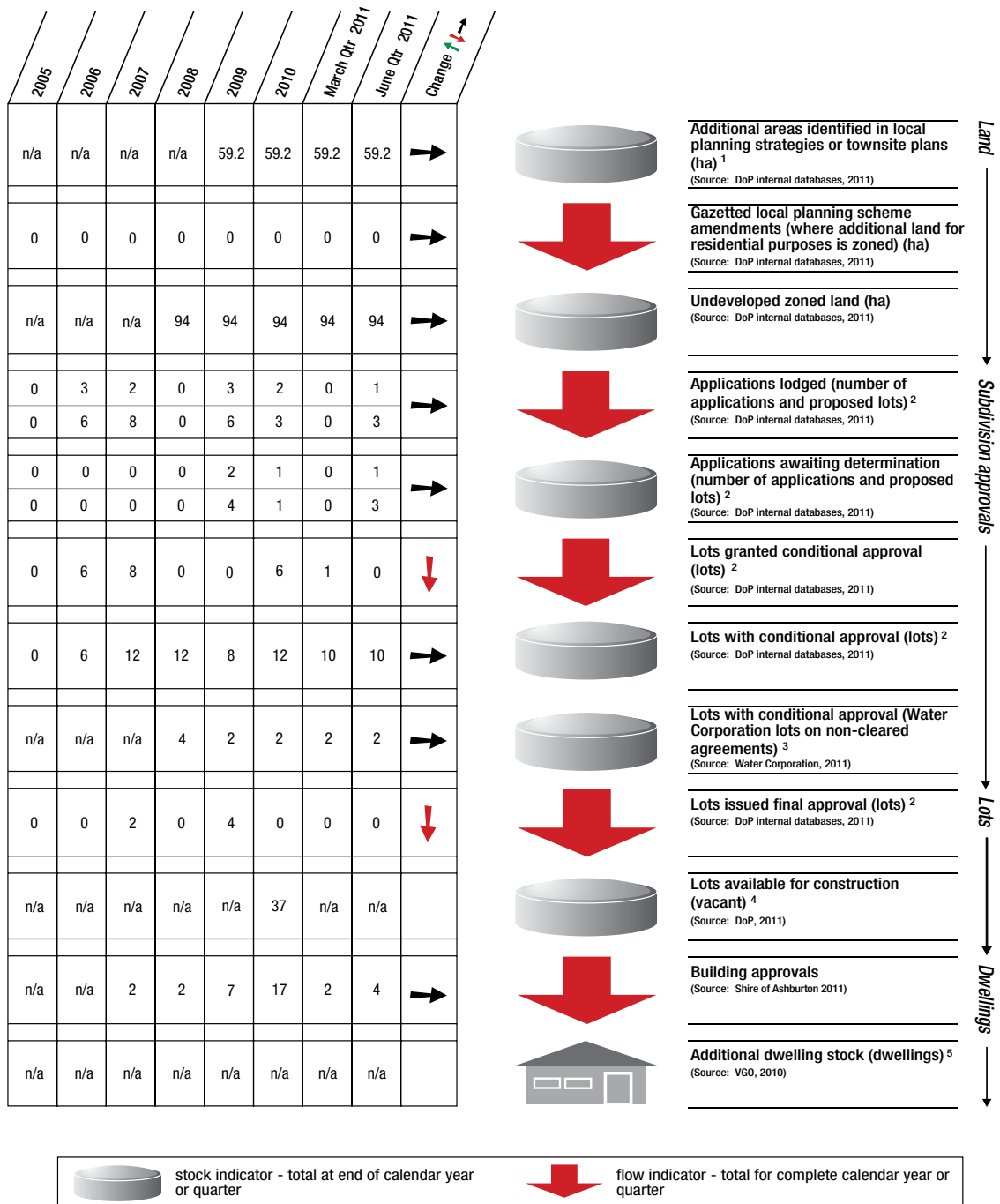
The overall forecast employment/population growth as outlined in section 4.1 of this document (that is population of 2200 by 2017 and 3750 by 2025) could potentially be accommodated in the areas identified in the *Onslow Townsite Strategy*. This will depend on development densities achieved and the extent of other land uses that are established within these areas.

**Table 19: Residential land release summary – Onslow**

Project	Short term (0-2yrs)	Medium term (2-5yrs)	Medium term (5-10yrs)	Long term (10yrs+)	Total
Infill sites					
Simpson Street (ONS07)	3	2	0	0	5
McRae Place (ONS08)	0	26	0	0	26
Cameron Avenue (ONS09)	3	0	0	0	3
Cameron Avenue/Anketell Court (ONS10)	0	11	0	0	11
Third Street/Payne Way/Watson Drive (ONS11)	0	30	0	0	30
Watson Drive (ONS13)	6	0	0	0	6
Anketell Court (ONS15)	3	0	0	0	3
Otway Court (ONS16)	2	0	0	0	2
McGrath Avenue (ONS17)	3	0	0	0	3
Lot 311 Second Avenue – residential component (ONS20)	3	0	0	0	3
Lot 381 Third Street - residential component (ONS23)	0	15-20	0	0	15-20
Hope Court (ONS24)	5	15	0	0	20
Simpson Street (ONS26)	0	19	0	0	19
Forrest Court (ONS27)	5	11	0	0	16
Hooley Avenue (ONS28)	3	0	0	0	3
McGrath Avenue/Payne Way (ONS30)	8	0	0	0	8
Maunsell Corner (ONS32)	3	0	0	0	3
Second Avenue (ONS33)	3	0	0	0	3
Simpson Street (ONS34)	3	0	0	0	3
Total infill sites	53	129	0	0	182
Greenfield sites					
Watson Drive/Lapthorne Avenue (ONS01A)	100	330		0	430
Watson Drive/Onslow Road (ONS01B)	To be determined				1362
Cameron Avenue (ONS02)	To be determined				48
First Street/Simpson Street (ONS03)	To be determined				Not determined
Total greenfield sites	100	To be determined			1840
Total residential					2022

Note: Dwelling yields are estimates only and will be determined by further detailed planning.

Figure 26: Residential land development pipeline – Onslow



<sup>1</sup> Additional development areas (residential/commercial areas not currently zoned) identified in *Onslow Townsite Strategy*. Strategy was endorsed by the WAPC in March 2011.

<sup>2</sup> Includes residential subdivision and strata applications/approvals for the purposes (that is subdivision, resubdivision, amalgamation, boundary realignment, road purposes).

<sup>3</sup> Refers to conditionally approved lots where a servicing agreement (agreement to construct) has been signed between the Water Corporation and the developer. These are termed lots on non-cleared agreements.

<sup>4</sup> Vacant lot survey conducted on 21 January 2011.

<sup>5</sup> Historic Valuer General's Office data is unavailable for the Shire of Ashburton.



**Table 20: Forecast additional dwelling unit requirements (family/single/FIFO)<sup>1</sup> – 2011 to 2025**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
<b>Known demand</b>																
Latent (families) <sup>2</sup>	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
Latent (singles) <sup>2</sup>	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Natural growth (families) <sup>2</sup>	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	45
Natural growth (singles) <sup>2</sup>	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	45
Macedon - FIFO village beds	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	20
Macedon - resident operational workers (families)	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Macedon - Non-operational workers (families) <sup>3</sup>	9	3	12	0	0	0	0	0	0	0	0	0	0	0	0	24
Macedon - Non-operational workers (singles) <sup>3</sup>	4	2	5	0	0	0	0	0	0	0	0	0	0	0	0	11
Onslow Salt - resident operational workers (families)	6	7	8	8	6	0	0	0	0	0	0	0	0	0	0	35
Onslow Salt - Non-operational workers (families) <sup>3</sup>	7	8	9	9	7	0	0	0	0	0	0	0	0	0	0	40
Onslow Salt - Non-operational workers (singles) <sup>3</sup>	3	4	4	4	3	0	0	0	0	0	0	0	0	0	0	18
<b>FIFO beds</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>
<b>Family dwelling units</b>	<b>46</b>	<b>21</b>	<b>36</b>	<b>20</b>	<b>16</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>169</b>
<b>Single dwelling units</b>	<b>19</b>	<b>9</b>	<b>12</b>	<b>7</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>103</b>
<b>Likely demand</b>																
Wheatstone FIFO village beds	0	0	0	0	0	0	225	0	0	0	0	0	0	0	0	225
Wheatstone - resident operational workers (families)	0	0	0	0	0	0	75	0	0	0	0	0	0	0	0	75
Wheatstone - Non-operational workers (families) <sup>3</sup>	7	19	10	4	3	1	177	0	0	0	0	0	0	0	0	221
Wheatstone - Non-operational workers (singles) <sup>3</sup>	3	9	5	2	2	1	76	0	0	0	0	0	0	0	0	98
<b>FIFO beds</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>225</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>225</b>
<b>Family dwelling units</b>	<b>7</b>	<b>19</b>	<b>10</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>252</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>296</b>
<b>Single dwelling units</b>	<b>3</b>	<b>9</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>76</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>98</b>
<b>Less certain (beyond 2017)</b>																
Second LNG - FIFO village beds	0	0	0	0	0	0	0	0	0	0	0	225	0	0	0	225
Second LNG - resident operational workers (families)	0	0	0	0	0	0	0	0	0	0	0	75	0	0	0	75
Second LNG - Non-operational workers (families) <sup>3</sup>	0	0	0	0	0	0	42	0	0	0	0	177	0	0	0	219

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Second LNG - Non-operational workers (singles) <sup>3</sup>	0	0	0	0	0	0	18	0	0	0	0	76	0	0	0	94
Ammonia/urea - FIFO village beds	0	0	0	0	0	0	0	0	0	0	0	60	0	0	0	60
Ammonia/urea - resident operational workers (families)	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	20
Ammonia/urea - Non-operational workers (families) <sup>3</sup>	0	0	0	0	0	0	4	4	4	4	4	47	0	0	0	67
Ammonia/urea - Non-operational workers (singles) <sup>3</sup>	0	0	0	0	0	0	2	2	2	2	2	21	0	0	0	31
Ammonium nitrate - FIFO village beds	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	45
Ammonium nitrate - resident operational workers (families)	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	15
Ammonium nitrate - Non-operational workers (families) <sup>3</sup>	0	0	0	0	0	0	4	4	4	4	4	36	0	0	0	56
Ammonium nitrate - Non-operational workers (singles) <sup>3</sup>	0	0	0	0	0	0	2	2	2	2	2	16	0	0	0	26
Methanol - FIFO village beds	0	0	0	0	0	0	0	0	0	0	0	38	0	0	0	38
Methanol - resident operational workers (families)	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	13
Methanol - Non-operational workers (families) <sup>3</sup>	0	0	0	0	0	0	4	4	4	4	4	30	0	0	0	50
Methanol - Non-operational workers (singles) <sup>3</sup>	0	0	0	0	0	0	2	2	2	2	2	13	0	0	0	23
<b>FIFO beds</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>368</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>368</b>
<b>Family dwelling units</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>54</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>413</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>515</b>
<b>Single dwelling units</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>126</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>174</b>

Total																
Total FIFO beds	0	0	20	0	0	0	225	0	0	0	0	368	0	0	0	613
Total family dwelling units	53	40	46	24	19	4	309	15	15	15	15	416	3	3	3	980
Total single dwelling units	22	18	17	9	8	4	103	9	9	9	9	129	3	3	3	375

Source: Based on data supplied by the Department of State Development, Department of Planning and LandCorp (2011).

<sup>1</sup> Total dwelling unit requirements for Onslow townsite only (does not include ANSIA based construction workers). Assumes project staging as detailed in Figure 10. Changes to project timing will impact the accuracy of these tables. Families refers to dwelling units for families and singles refers to dwelling units for singles.

<sup>2</sup> Assumes 70/30 family/singles ratio.

<sup>3</sup> Includes indirect, consequential and non-specific contract workers associated with each project.

## 6.9 Transient workforce accommodation (TWA)

### Local planning controls

Transient workforce accommodation is a discretionary use under the following *Shire of Ashburton Town Planning Scheme No. 7* zones: Residential, Urban Development, Tourism, Industrial and Mixed Business Development, Strategic Industry, Rural and Rural Living. Transient workforce accommodation is also an incidental use in the following zones: Mixed Business, Community, Education and Airport.

The Shire of Ashburton; however, has initiated *Amendment No. 8* to the town planning scheme to prohibit the development of TWA in the Strategic Industry Zone. *Amendment No. 8* was adopted for final approval by council in June 2010 but has not yet been gazetted. In addition, the Shire of Ashburton has initiated *Amendment No. 14* to the town planning scheme to allow TWA as a discretionary use in the Commercial and Civic Zone. *Amendment No. 14* was initiated February 2011 and adopted for advertising in May 2011. The intent of the amendment is to encourage a design and development of a high quality for the benefit of occupiers, as well as the community. It is proposed that development be of a permanent nature, representing motel or resort style development, with a limitation on the overall proportion of TWA within the development. A draft local planning policy defining design criteria has also been prepared and will be advertised concurrently with *Amendment No. 14*.

The Shire of Ashburton is also guided by its *Local Planning Policy 13 - Transient Workforce Accommodation*. This policy defines two types of TWA camps (Type A – within or close to existing urban centres and Type B – more remote and independent from urban centres) and outlines a number of development standards and requirements. The Shire of Ashburton is in the process of amending this policy (awaiting consideration for final approval) so that:

- construction TWA camps may be placed close to specific development for a limited length or time, while operational TWA camps should as far as practical, be placed within an existing town to incorporate the workforce with the community and add to the vibrancy and economic sustainability of the towns of Tom Price, Onslow, Paraburdoo and Pannawonica.

- operational TWA within townsites is of a high quality for the benefit of the occupiers and the community.
- with motel style development, council may seek to limit the overall proportion of TWA within a development so that some tourist access may be available.

### Existing and future TWA developments

In Onslow, the supply of TWA has increased over the past decade, with the largest establishment providing this type of accommodation being Beadon Creek Caravan Park (Beadon Bay Village), comprising 60 units (as noted in Shire of Ashburton March 2010 minutes of council meeting). This is the only independent TWA facility within the Onslow townsite. The facility was expanded in 2010 to include additional transportable buildings comprising 64 units in total (temporary approval for three years). The facility also includes a number of long stay caravan/camping bays.

A TWA village is to be located away from the Onslow townsite at the ANSIA which is to house construction workforces associated with resource project development. Stage 1A of the draft ANSIA structure plan depicts a 300 ha site to accommodate between 3000 - 5000 Chevron Australia project workers at peak (4300 as advised by Chevron Australia, May 2011) during the first stage of construction of the new port, common user coastal area and Wheatstone developments and is to be self contained with its own services providing recreational, entertainment, laundry, dining and other domestic facilities. This TWA use is expected to be phased out over time as major construction work is completed, which could be up to 2021 and beyond depending on future project approvals and management rights.

Detailed investigations are being undertaken for relevant development plans for a second TWA site south of the Chevron Australia TWA site to house construction workers associated with development of other industries. This has not been assessed in the foundation proponent's Environmental Impact Statement/ Environmental Review and Management Program for stage 1A, however, it is anticipated to be included in the ANSIA structure plan as part of stage 1B. This will ensure that any future incoming proponent is not reliant upon the vacation of Chevron Australia's camp area and any additional temporary accommodation facilities can be accommodated appropriately within the ANSIA.

Construction workers associated with the Macedon project are to be accommodated on the Macedon site for the duration of the construction period (expected to be 2011-2013).

Approximately 75 per cent of the operational workers associated with the major resource projects are expected to be FIFO. These workers are to be accommodated at permanent TWA villages located within the townsite. Investigations are currently underway to secure sites for two operational TWA camps within the Onslow townsite. BHP Billiton Petroleum requires a camp to accommodate 20 persons by the end 2013 for its Macedon project and Chevron Australia requires a camp to accommodate 225 persons by the end of 2016 for the Wheatstone project. A number of sites have been preliminarily identified for investigation by the Shire of Ashburton and LandCorp.

The major proponents within the ANSIA have the capacity to plan, fund, build and fully service TWA to support their workforces and meet their housing requirements. There are; however, a number of other individual and teams of workers who will need accommodation on a temporary basis for incidental and indirect activities such as road building, other construction crews and contractors. As these workers are not directly associated with the construction or operation of the resource projects, their accommodation has not been factored into the TWA villages being planned for the Macedon and Wheatstone projects.

Beyond the employment estimates prepared by the State Government agencies, the Shire of Ashburton suggests that there is a possible demand for additional TWA for 750 people that has not yet been planned for. This facility would accommodate workers not included in existing estimates, such as (but not limited to) upgrades to utility infrastructure, upgrading and realignment of Onslow Road, development of industrial land at the airport, development of industrial land at Beadon Creek maritime facility, new housing projects, underground power works (estimated 300 - 400 workers) and coastal studies. Most of these activities will attract labour from out of town and increase the demand for accommodation on a temporary basis. Accommodation for a proportion of these workers may be needed by as early as 2012.

### Adequacy of supply

Beyond facilities being planned to accommodate the FIFO operational workforce component of the Macedon and Wheatstone project, no additional facilities are currently being planned.

As stated, the Shire of Ashburton suggests that there may be demand for a 750 person TWA facility which has not been accounted for in demand forecasts. If this shortfall is not addressed in the short term, it may further impact not only availability, but affordability of accommodation (including tourist accommodation) in Onslow.

As transient workforce accommodation is a discretionary use under a number of zones (including Tourism Zone) in the *Shire of Ashburton's Town Planning Scheme No. 7*, TWA facilities could potentially be established in a number of locations (subject to approval and availability of services). The Shire of Ashburton also recently initiated *Amendment No. 14* to the town planning scheme to allow transient workforce accommodation as a discretionary use in the Commercial and Civic Zone. If approved, this amendment would encourage high quality more permanent development (motel/resort style), with a limitation on the overall proportion of TWA within the development. Even if projects include a portion of TWA, it will not meet the additional demand for this accommodation suggested by the Shire, and a larger facility would be required.

There is a significant amount of undeveloped Tourism zoned land under the control of State or local government in Onslow. The majority of this land however is located within the Onslow Coastal Hazard Area Special Control Area which has significant implications for development. Development of these areas could potentially be a short-term solution to worker accommodation issues, with any permanent buildings developed potentially being converted to tourism facilities in the longer term. Development of this land; however, is also subject to the preparation of a foreshore study (under way) which will investigate development options.

There are also existing council controlled facilities (on Tourism zoned land) that may present opportunities for redevelopment in the short to medium term, and could potentially be developed to allow a portion of TWA. These sites are somewhat underutilised and could be redeveloped to provide substantially more accommodation.

## 6.10 Aged persons housing

There is limited aged persons housing available in Onslow. There are currently nine aged persons independent living residential units located behind the Onslow Goods Shed Museum on Second Avenue which are owned and managed by the Shire of Ashburton (senior citizen units and Carinya Community Housing Scheme units). Four of the units were recently upgraded (\$50,000 spent on each). The Shire of Ashburton has allocated \$78,000 in the 2010/11 budget for upgrades to the senior citizens units and capital upgrade to the Carinya units. Significant funds have not been expended to date due to floor level height restrictions in this vicinity and the nature of existing housing accommodation which are very basic transportable modules. The future use of this site will be considered as part of the foreshore study.

There is an additional undeveloped site reserved for aged persons accommodation (vested to the Shire of Ashburton) located on McRae Place. The 3780 m<sup>2</sup> site is well located, in close proximity to the existing town centre and recreation precinct. Development of the site for this purpose is subject to further structure planning work currently being undertaken by LandCorp in consultation with the Shire of Ashburton.

### Adequacy of supply

The Shire of Ashburton has advised that there are 12 people on the waiting list for aged persons housing in Onslow. Considering the town has a relatively high proportion (in comparison to other Pilbara towns) of persons aged 65 and over, an additional supply of aged persons housing will be required in the future. This future demand has not yet been quantified.

The Shire of Ashburton has set up an Onslow Advisory Committee to assist in the development of an aged care strategy. This will include looking at long term housing and accommodation needs for the aged.

## 6.11 Industrial

### Recent subdivision activity

No industrial subdivision activity was recorded in Onslow over the period 1999/00 to 2010/11. At 30 June 2011, there was one application with conditional approval for industrial subdivision (two lots).

### Industrial zoned land supply

As at March 2011, there was just under 580 ha of land zoned for industrial uses in Onslow (Table 21). The majority of this land (490 ha) is zoned Strategic Industry, all of which remains undeveloped. The strategic industrial area is no longer considered suitable for development, given its limited size and location in close proximity to the existing Onslow townsite. *Amendment No. 10* was initiated by council in December 2010 and advertised for public comment in August 2011 to rezone this area to Rural and delete the special control area. The future use of this site requires further investigation.

Of the land zoned Industry, approximately 11 ha accommodates the Onslow industrial estate, 46 ha Onslow Salt operations, and 29 ha remains undeveloped (located to the south of the Water Corporation wastewater treatment plant and west of Onslow Road).

**Table 21: Industrial zoned land supply – Onslow**

Zone	Developed (ha)	Undeveloped (ha)	Total
Industry	57.2	29.5	86.7
Strategic industry	0	490.5	490.5
<b>Total</b>	<b>57.2</b>	<b>520.0</b>	<b>577.2</b>

Source: Internal databases, Department of Planning (2011)

The existing industrial estate is located on Beadon Creek Road, between the town's main entry road and Beadon Creek Maritime Facility. The existing zoned land is fully developed and most lots are fully utilised. Much of the estate is used for storage and material lay-down facilities, and also accommodates a number of caretaker dwellings. Land to the east and west of the maritime facility is reserved for harbour purposes and the DoT has recently made available a number of lease sites for development. The

area is zoned Public Purposes (Port Facilities) and may support marine industrial-type activity that services the harbour function.

The *Onslow Townsite Strategy* identifies an extension to the existing industrial estate (approximately 9 ha). This area is quite constrained and, if developed, would potentially yield only a small number of lots. Further investigation of this site is required. The strategy also identifies an area adjacent to the Onslow airport (approximately 16 ha) for future industrial uses.

The *Onslow Airport Master Plan*, adopted by the Shire of Ashburton in November 2010, identifies the development of surplus land for mixed business and industrial uses (over two precincts). The Shire has recently initiated amendments to the local planning scheme (*No. 15 and 16*) to rezone this area to Mixed Business (approximately 76 ha). Subdivision approval will also be required. Precinct one could be developed in the short term (subject to approvals) and includes lots for airport operations (5 lots), freight logistics (12 lots), airport commercial (9 lots) and light industrial uses (33 lots). Development of precinct two (65 lots) is restricted by the water pipeline easement and man made drainage basin to the southern side of the precinct. Negotiation with Onslow Salt is also required to resolve access and tenure issues.

LandCorp is progressing planning for the development of lots suitable for general industrial uses at the ANSIA (11 km south west of Onslow). Two areas totalling approximately 200 ha have been identified which could potentially yield a large number of lots (depending on lot size and end user requirements). Development will require the resolution of a number of issues, with lots not likely to become available in the short term.

The ANSIA will comprise approximately 8000 ha and accommodate strategic industrial uses such as LNG processing and associated facilities. This land is currently zoned Rural or a reserve for Conservation, Recreation and Nature Landscape *Town Planning Scheme No. 7*. Following gazettal of *Amendment No. 9*, the area is now subject to a special control area with associated requirements for structure plans and development plans. *Amendment No. 9* also includes a policy statement to be inserted in the scheme text which, among other things, does not generally support FIFO and reference to removal of the existing Onslow strategic industrial area to allow for further expansion of the town and a varied mix of land uses.

A draft structure plan for the ANSIA has been prepared by Chevron Australia guided by a working group (also comprising Shire of Ashburton, DoP, Environmental Protection Authority, PA, DSD, LandCorp and Dampier Port Authority). The structure plan will require the approval of the Shire of Ashburton and the WAPC. Further development plans (addressing such issues as integration with other land uses, risk assessment, Aboriginal Heritage, water management strategy and servicing/staging) and local planning scheme amendments will be required prior to development approvals being forthcoming.

### Industrial land release

#### In summary:

- Development of resource projects will result in increased demand for industrial land, especially for support industries. The existing industrial estate is fully utilised; therefore, additional industrial land will likely be required in the short term.
- The Shire of Ashburton is progressing planning to commence development of the Onslow Airport Enterprise Centre in the short term. The *Onslow Airport Master Plan* includes provision for lots suitable for airport operations, freight logistics, airport commercial and light industrial (over two precincts). The Shire is currently seeking expressions of interest to determine land use needs, and has initiated *Amendment No. 15 and 16* to rezone the area to Mixed Business.
- Additional land (lease of unimproved land) was recently made available at Beadon Creek for the provision of marine/support industrial uses (stage one – approximately 8 ha). This was initiated due to ongoing pressures for land to establish businesses and industries supporting the offshore oil and gas industry. The DoT is currently negotiating with potential lessees, with development of sites anticipated to commence in 2011. This land is not zoned Industrial under *Town Planning Scheme No. 7*, rather it is reserved for public purposes (port facilities).

Land release information is summarised in Table 22. Further project specific information is available in Table 27 and Maps 5 and 6.



**Table 22: Industrial land release summary – Onslow**

Project	Short term (0-2yrs)	Medium term (2-5yrs)	Medium term (5-10yrs)	Long term (10yrs+)	Total
Onslow Airport Enterprise Centre (ONS04)	59 lots	Precinct 2 (65 lots) - subject to demand			124 Precinct 1 - 59 lots Precinct 2 - 65 lots
Extension to industrial estate (ONS06)	To be determined				20
Beadon Creek expansion (ONS31)	Up to 8 ha	Stage 2 (~100 ha) - subject to demand			~108 ha
ANSIA general industrial lots (ONS35 & ONS36)	To be determined				204 ha
Total industrial	59 lots + up to 8 ha	To be determined			144 lots + 300 ha+

## 6.12 Commercial/retail

### Adequacy of supply

Given existing demand levels and considering the likelihood of the development of resource projects, land suitable for general and light industrial uses will need to be made available in the short term to support both the construction and operational phases of these projects. Demand for light industrial/mixed business land is anticipated to be met with the development of the Shire's surplus freehold land at the Onslow airport (precinct one includes 59 lots for airport operations, airport commercial, freight/logistics and light industrial uses). The shire is currently determining land use needs and is progressing planning and approvals for this project. Subject to obtaining required approvals and resolving servicing issues, land could be made available in the short term.

Demand for general industrial land has not been quantified, but is likely to increase with the development of resource projects in the area. An extension to the existing industrial area has been identified as part of the *Onslow Townsite Strategy*, however this area has a number of constraints and would potentially yield only a small number of lots. General industrial land needs will likely be met through development of lots at the ANSIA. Recent modifications to the Draft ANSIA structure plan include an area for general industry as part of stage 1A; however, these lots may not become available in the short term due to the requirement to resolve a number of development issues.

### Commercial/retail zoned land supply

As at March 2011, there was 9 ha of land zoned for commercial uses in Onslow (Commercial and Civic Zone) located along First Avenue and Second Avenue (Table 23).

Much of the zoned area; however, is occupied by residential dwellings with very limited commercial activity. According to the Valuer General's Office data (November 2010), of the 46 lots zoned Commercial and Civic:

- 24 lots are used for residential purposes;
- 12 lots are used for commercial purposes; and
- 10 lots are vacant.

The *Onslow Townsite Strategy Background Report* estimates that the town centre has a retail floorspace of 1360 m<sup>2</sup>. Existing commercial activity includes a hotel, two tourist accommodation complexes, museum/visitors' centre, two service stations, supermarket (recently sold and upgrading proposals expected soon), post office agency, hardware store, café (not operating) and a restaurant. The *Shire of Ashburton Town Planning Scheme No. 7* also allows for the establishment of small home businesses (subject to planning approval). Onslow residents currently need to travel to Karratha to access higher order retail services.



The existing town centre is also subject to flooding during extreme weather events, and this has been associated with the lack of utilisation for commercial purposes.

Land located on higher ground at the northern end of Third Avenue has been identified in the *Onslow Townsite Strategy* for development of commercial and civic uses. This land is impacted less frequently by severe weather events and is therefore more likely to be developed and maintained.

**Table 23: Commercial/retail zoned land supply – Onslow**

Zone	Developed (ha)	Undeveloped (ha)	Total
Commercial and Civic	8.0	1.0	9.0
<b>Total</b>	<b>8.0</b>	<b>1.0</b>	<b>9.0</b>

Source: Internal databases, Department of Planning (2011)

### Commercial/retail development

In summary:

- A small amount of commercial floorspace recently became available with the opening of the Onslow Multi-Purpose Centre.
- Project ONS20 has been identified for the development of commercial floorspace in Onslow. The proposal is for a mixed use development comprising three offices (110 m<sup>2</sup> each) and three caretaker residences.
- The existing supermarket may potentially be expanded and a larger facility developed.
- Further commercial/retail opportunities will be guided by structure planning work currently being undertaken.

Further project specific information is available in Table 27 and Map 6.

### Adequacy of supply

With the anticipated development of resource projects in the area and an increase in temporary and permanent residents, demand for commercial and retail facilities will increase. This demand (estimate of future floorspace requirements) has not been quantified, and could be addressed through preparation of a local commercial/retail strategy. Given that this demand has not been quantified, it is difficult to make an overall assessment on the adequacy of supply.

Currently, the availability of commercial/retail floorspace in Onslow is extremely limited, and few projects are planned to develop additional commercial/retail facilities in the short term. This may result in a further shortfall, with floorspace likely to become increasingly scarce. While a large area is zoned Commercial and Civic, only a small portion has been developed for these purposes, with single residential dwellings the predominant use. This area is also within the Onslow Coastal Hazard Area Special Control Area which is a factor in the lack of investment and utilisation of this land for commercial purposes.

Townsite structure planning (currently under way) is looking at various options regarding the location of the town centre and other commercial nodes. This is to be investigated further by the Shire of Ashburton and LandCorp in conjunction with the community.

## 6.13 Tourism

### Accommodation/occupancy summary

Small area data from the ABS indicate there were six recorded hotels, motels and serviced apartments with five rooms or more in the Shire of Ashburton during the March quarter of 2011. During this period there were 668 rooms and a total of 1054 bed spaces available. This represents an increase of 19 beds when compared with the March quarter 2010, however there were 51 fewer beds and 39 fewer rooms when compared to data for the December quarter 2007 (Figure 27). This data includes all settlements within the Shire of Ashburton — care should be taken when using this data as trends for the shire may not be indicative of trends experienced in Onslow.

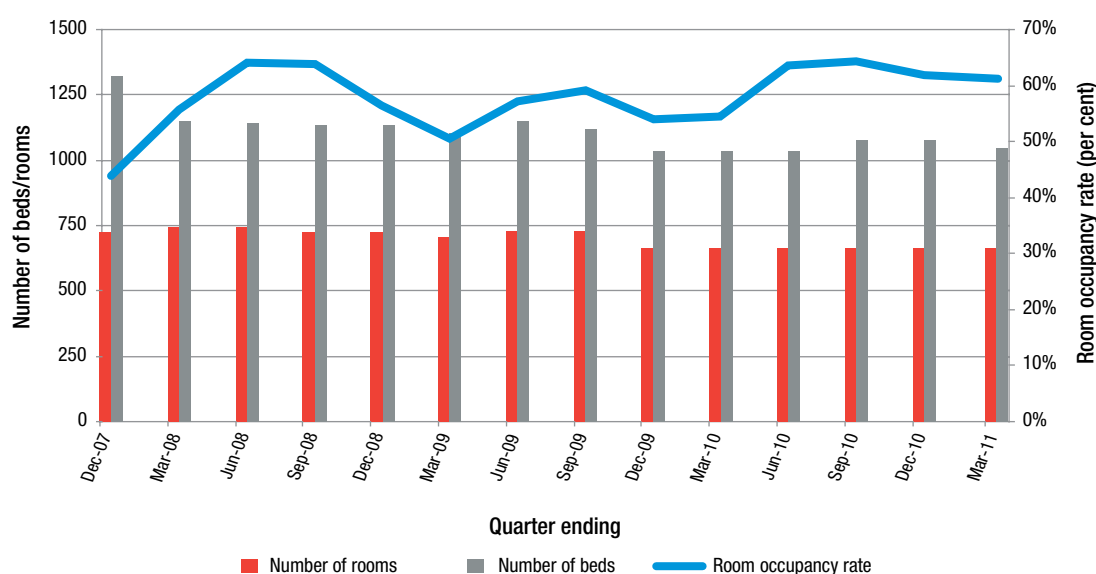
During the three months to March 2011, 36,666 room nights were occupied which equates to an average room occupancy rate for the quarter of 61 per cent. The average length of stay was 5.8 days. This compares to an occupancy rate of 54.5 per cent for the March quarter of 2010 and an average length of stay of 5.8 days. Data indicates seasonal variation with higher occupancy rates recorded in the dry season, which is considered the peak tourism season for this region.

Data for caravan parks indicate four caravan parks (of which two are in Onslow) were operating in the June quarter 2010 with capacity for around 580 people. The majority of sites were other powered sites (44 per cent) and unpowered sites (25 per cent). Cabins, flats, units and villas represented 31 per cent of sites. There were 22,195 site nights occupied for the quarter ending June 2010 which equates to an occupancy rate of 42.1 per cent over the period. During the June quarter 2010, 47 sites or approximately 8 per cent of all sites were occupied by long-term guests (stays of longer than two months).

Data specific for Onslow is shown in Table 24. This data indicates a variety of tourist accommodation available in Onslow ranging from camping and caravan sites to motel rooms and self-contained units. The Shire of Ashburton controls two of these facilities (Onslow Sun Chalets and Ocean View Caravan Park), which are located on Crown reserves vested to the Shire. The operation of these facilities is managed on a lease arrangement, with approximately three years remaining on each lease.

The Shire's *Tourism Destination Development Strategy* recommends that the Shire retain freehold ownership of the Ocean View Caravan Park site (2.31 ha) at the end of the current lease with a view to securing a professional caravan park operator. The shire may also seek capital investment (refurbish existing or install new facilities) as a condition of the lease. With regards to the Onslow Sun Chalets site (1.43 ha), the strategy recommends an assessment of development options at the end of the current lease, including extending the current lease, tendering of the leasehold business (with a view to securing operator willing to invest capital to improve facilities) or seeking expressions of interest for freehold purchase. These recommendations will need to be considered in light of outcomes of the proposed foreshore study.

**Figure 27: Hotels, motels and serviced apartments with more than five rooms – Shire of Ashburton**



Source: Catalogue 8635.5.55.002 - Tourist Accommodation, Small Area Data, Western Australia, Australian Bureau of Statistics (2011)

**Table 24: Tourism accommodation summary – Onslow**

Site	Accommodation type	Capacity
Onslow Ocean View Caravan Park	Caravan park	126 caravan/camping bays 8 units (sleep 6 people each)
Beadon Bay Hotel	Hotel	14 rooms
Onslow Sun Chalets	Motel, chalets	7 motel rooms 9 self-contained units
Onslow Mackerel Motel (The Ashburton Resort Motel)	Motel	37 units (self-contained)
Beadon Bay Village	Caravan park	63 caravan/camping bays (53 long stay, 10 short stay) 124 units (TWA)
<b>Total</b>		<b>179 caravan/camping bays</b> <b>21 rooms</b> <b>178 units</b>

Source: Onslow Townsite Strategy Background Report, Shire of Ashburton (2010)

In addition, short term camping is permitted (three days) along the Ashburton River. The area is accessed via Old Onslow Road that extends along the southern boundary of the proposed ANSIA. This will likely be impacted by the development of the ANSIA.

As demand for housing and accommodation increases, short-stay accommodation may come under increased pressure for occupation by long-term guests such as resource company employees (contractor block bookings) or lower paid service workers unable to afford more permanent/alternative accommodation. This may then result in visitors experiencing difficulties in securing affordable accommodation, with tourists potentially bypassing Onslow altogether.

### Tourism zoned land supply

There is approximately 25 ha of land zoned for tourism purposes in Onslow, approximately 18 ha of which remains undeveloped (Table 25). The undeveloped areas are located west of the Bindi Bindi Community on Second Avenue, and along Beadon Creek Road near Beadon Creek. In terms of tenure, the majority of the undeveloped areas are either Crown reserves, unallocated Crown land or are owned freehold by Shire of Ashburton.

The majority of the tourism zoned land is located within the Onslow Coastal Hazard Area Special Control Area. The area zoned tourism located on Beadon Creek Road is also within the Onslow Airport Height Restrictions Area Special Control Area. There are currently no plans to develop the land located on Beadon Creek Road or adjacent to the Bindi Bindi Community for tourism purposes. Some of this land may possibly be utilised to accommodate transient, construction and maintenance workforces associated with the development of major resource projects given that the local planning scheme allows transient workforce accommodation within the tourism zone as a discretionary use. Preparation of a foreshore study will guide development of this land.

It is also worthy to note that uses such as holiday accommodation, hotel and motel may also be permitted within the Commercial and Civic Zone (discretionary use), with hotels and motels also being a possibility in the Rural Zone or even in a Rural Living Zone for motels. The Ashburton Resort Motel (Mackerel Motel) is zoned Commercial and Civic. Development for holiday units has also recently been approved at an adjacent site (ONS18 and ONS19) also zoned Commercial and Civic.

**Table 25: Tourism zoned land supply – Onslow**

Zone	Developed (ha)	Undeveloped (ha)	Total
Tourism	6.9	18.0	<b>24.9</b>
<b>Total</b>	<b>6.9</b>	<b>18.0</b>	<b>24.9</b>

Source: Internal databases, Department of Planning (2011)

### Tourism accommodation development

In summary:

- There is a current proposal to develop additional accommodation (58 units) as part of development of The Ashburton Resort Motel (ONS14), formerly the Onslow Mackerel Motel. Stage one of the project, comprising 20 units was completed in late 2010. Stage two (28 units) is currently under construction, with timing for stage three (30 units) yet to be determined. Development beyond stage two will require local government planning and building approvals, and resolution of infrastructure issues.

- Planning approval has been granted for the development of 18 holiday accommodation units at adjacent lots 308 First Avenue (ONS18) and 309 Second Avenue (ONS19). Development is anticipated in the short term subject to resolution of servicing issues.
- Lot 381 Third Street (ONS23) is also identified for development of tourism uses. The Shire gave in-principle support in February 2011 to initiate a local planning scheme amendment to facilitate the development of residential and tourism uses on the site, which is currently zoned Tourism. The site could potentially yield 30 - 40 units in total – the actual yield for tourism purposes will be determined by further detailed planning.
- The Mackerel Island Holiday Village has recently undergone expansion with the construction of an additional 20 unit two storey development. Stage two of this expansion including another 28 units has been approved and is expected to commence within the next two years. Longer term plans include the development of 30 more units.
- Two council controlled sites (Onslow Sun Chalets and Ocean View Caravan Park) have leases which are due to expire in approximately three years. The Onslow Sun Chalets site is under utilised and could be redeveloped to yield significantly more units.
- Development on undeveloped areas zoned Tourism will be guided by the preparation of a foreshore study.

Land release information is summarised in Table 26. Further project specific information is available in Table 27 and Map 6.

Tourism WA continually monitors private and public sector tourism development activity occurring across the State, maintaining a comprehensive database which tracks the progress of tourism accommodation projects. The department publishes summary information in the *Register of Significant Tourism Accommodation Development*, published on an annual basis.

Note that additions to caravan park facilities have not been captured by DoP research of land development projects.

### Adequacy of supply

Currently Onslow experiences a shortage of accommodation for the mobile visitor population during peak periods. Due to limited housing availability and affordability issues, some of the tourism accommodation facilities are being occupied by longer-term guests. While future demand for tourist accommodation has not been quantified, without the development of additional tourist accommodation, holiday and business visitors may find it more difficult to secure affordable accommodation in Onslow in the future.

There is a significant amount of undeveloped land zoned Tourism in Onslow, having significant development potential. The majority of this land however is located within the Onslow Coastal Hazard Area Special Control Area which has significant implications

**Table 26: Tourism accommodation development summary – Onslow**

Project and map reference	Short term (0-2yrs)	Medium term (2-5yrs)	Medium term (5-10yrs)	Long term (10yrs+)	Total
Ashburton Resort (ONS14)	28	Stage 3 (30 units) – timing to be determined			58
Lot 308 First Avenue (ONS18)	9	0	0	0	9
Lot 309 Second Avenue (ONS19)	9	0	0	0	9
Lot 322 Second Avenue (ONS21)	12	0	0	0	12
Lot 381 Third Street - tourism component (ONS23)	0	15-20	0	0	15-20 (assuming 50% of 30-40 units in total - actual yield to be determined)
<b>Total</b>	<b>58</b>	<b>15-20</b>	<b>30</b>	<b>0</b>	<b>103+</b>

for development. The Shire is in control of the majority of the developed and undeveloped sites along the foreshore. Preparation of a foreshore study (under way) will investigate various development options and guide future development of this land.

There are also existing council controlled facilities that may present opportunities for redevelopment in the short to medium term. These sites are somewhat underutilised and could be redeveloped to provide substantially more accommodation.

While Onslow offers a range of accommodation options, recent and proposed developments offer higher end accommodation options. It is important that Onslow maintains a variety of tourism accommodation options into the future, ranging from more affordable caravan and camping sites to motel rooms and self-contained units and apartments.

#### Land and housing supply – for more information see the following links:

Government of WA Ministerial Media Statements:

[www.mediastatements.wa.gov.au](http://www.mediastatements.wa.gov.au)

Blueprint for Pilbara Cities (27 November 2009)

Australian Bureau of Statistics: [www.abs.gov.au](http://www.abs.gov.au) see

ABS 2006: Census tables: Onslow (urban centre/locality)

- 2068.0 - Dwelling structure (location on census night)

Western Australian Planning Commission:

[www.planning.wa.gov.au](http://www.planning.wa.gov.au) see

Shire of Ashburton local planning scheme

Shire of Ashburton: [www.ashburton.wa.gov.au](http://www.ashburton.wa.gov.au) see

Onslow Townsite Strategy, local planning policies, Tourism Destination Development Strategy, Onslow Airport Master Plan

Table 27: Project summaries - Onslow

Identifier	Land ownership <sup>1</sup>	Location <sup>2</sup>	Existing tenure <sup>3</sup>	Purpose	Zoning / planning			Area / yield <sup>4</sup>			Subdivision approvals <sup>5</sup>				Anticipated release <sup>7</sup> (commencing mid 2011)				Constraints <sup>8</sup>				Comments
					Current zoning	Amendment required / initiated	Other planning under way	Area (ha)	Yield (lots)	Yield (units)	Approvals pending	Current approvals	Lots on non cleared agreements <sup>6</sup>		Short term (0-2 yrs)	Medium term (2-5 yrs)	Medium term (5-10 yrs)	Long term (10+ yrs)	Resolved	Concern but resolution anticipated	Critical but resolution anticipated	Critical and resolution not definite	
ONS01A	G	Lot 214, 215, 216 & 571 Watson Drive, Lot 301 Hooley Avenue, Lot 41 Laphorne Avenue, Lot 303 Onslow Road (CR 19291)	State of WA (UCL - Lot 41, 214, 215, 216, 301 & 571)	Residential	Urban Development	No	Townsite structure planning commenced	30.74	430 (assuming 70% developable area and average lot size 500 m² – R20)	0	0	0		100	330 (subject to demand)	0	Z		H, L, NT, P, Pw, S, W		Development subject to resolution of development issues such as further planning, Indigenous heritage, land assembly, clearance of Native Title etc. Concept plan prepared for this area, requires preparation of development plan. Development is subject to major upgrades to water, wastewater and power infrastructure which are currently operating close to or above capacity. This area is less constrained than surrounding urban expansion area (i.e. ONS01B). Portion of lots may be developed in short-term (subject to approvals). Actual yield will depend on land uses to be accommodated within this area and residential densities - to be determined by further structure planning.		
ONS01B	G	Lot 214, 216 & 571 Watson Drive, Lot 301 Hooley Avenue, Lot 41 Laphorn Avenue, Lot 303 Onslow Road (CR 19291), Lot 448 (CR 27316) & 591 (CR 38472) Watson Drive, Lot 69, 70, 73, 74, 75, 76, 78 & 80 Onslow Road (leasehold), Lot 71 (CR 38264), 72 & 77 (CR 50269), & 129 (CR 39155) Onslow Road	State of WA (UCL - Lot 41, 214, 215, 216, 301 & 571)	Residential	Urban Development, Conservation, Recreation & Nature Landscape, Public Purposes – Water and Drainage, Rural Living	Yes (for portion – not initiated)	Townsite structure planning commenced	126.6 (97.35 ha excluding area within buffer)	1362 (assuming 70% developable area and average lot size 500 m² – R20) (does not include area within wastewater treatment plant buffer)	0	0	0		To be determined						H, L, NT, P, Pw, S, W, Z		Area identified in Onslow Townsite Strategy for urban development. Portion of area zoned for urban development, remainder of area requires local planning scheme amendment. Requires clearance of NativeTitle (for portion), clearance under section 16(3), land assembly and further planning. Development is subject to major upgrades to water, wastewater and power infrastructure which are currently operating close to or above capacity. Decommissioning of Bindi Bindi wastewater treatment plant (servicing local community) also required and needs to be considered as a high priority. Development (over portion of area) subject to review of existing buffers (wastewater treatment plant, airport noise contours). Western portion requires significant fill, sourcing of which requires further investigation. Actual yield will depend on land uses to be accommodated within this area and residential densities - to be determined by further structure planning.	
ONS02	G	Lot 301 Hooley Avenue, Lot 302 Burt Close	State of WA (UCL)	Residential	Urban Development, Conservation, Recreation & Nature Landscape	Yes (for portion – not initiated)	Townsite structure planning commenced	3.47	48 (assuming 70% developable area and average lot size 500 m² – R20)	0	0	0		To be determined						L, NT, P, Pw, S, W, Z		Area identified in Onslow Townsite Strategy for urban development. Portion of area is zoned for urban development. Requires land assembly, further planning and local scheme amendment (for portion).	
ONS03	G	Crown land Simpson Street, Lot 300 First Street	State of WA (UCL)	Development investigation area	Conservation, Recreation & Nature Landscape	Yes (not initiated)	Townsite structure planning commenced	15.37	169-215 (assuming 55-70% developable area and average lot size 500 m² – R20) (to be further determined by structure planning)	0	0	0		To be determined						L, NT, P, Pw, S, W, Z		Potential greenfield opportunity. Identified in Onslow Townsite Strategy for new commercial/civic area. Requires land assembly, further planning and local scheme amendment. Located on higher ground which may lessen impacts of extreme weather events. Site has moderate to low risk area for acid sulphate soils and requires further investigation. Significant height variation across site, requiring significant earthworks for development. Planning will also need to consider alignment of ring road in this area. Ultimate uses to be determined by further detailed planning.	
ONS04	G	Lot 16 Onslow Road	Shire of Ashburton	Industrial	Public Purposes - Airport	Yes (Amendment no. 15 & 16 initiated March 2011 -> mixed business)		67.09	124      124	0	0	0		59 (Precinct 1)	Precinct 2 - subject to demand					P, Pw, W, Z		Identified in Onslow Townsite Strategy for industrial uses. Shire of Ashburton owns airport land freehold. Aerodrome master plan prepared identifying development over two precincts (precinct 1 - terminal precinct, precinct 2 - southern precinct) including lots for airport operations, freight logistics, airport commercial and light industrial. Potential yield of 85 light industrial lots, 25 general aviation lots, 9 airport related lots and 5 airport operations lots. Development requires local planning scheme amendment (amendment no. 15 & 16 initiated March 2011 to rezone to mixed business), further planning (adoption of master plan, subdivision). Development of precinct 2 is restricted by the water pipeline easement and the man made drainage basin to the southern side of the precinct.	
ONS06	G	Lot 973 Shanks Road	State of WA (UCL)	Industrial	Public Purposes - Port Facilities	Yes (not initiated)		9.06	20      20	0	0	0		To be determined						NT, P, Pw, S, W, Z	E	Area identified in Onslow Townsite Strategy as extension to existing industrial area. Suitability of site for these uses requires further investigation. Site has geotechnical and environmental issues, requires clearance of Native Title, further planning, local planning scheme amendment. Yield is estimate only.	
ONS07	G	Lot 650 Simpson Street	State of WA (UCL)	Residential	Residential R12.5	No. Amendment will be required if developed at a higher density.		0.39	1      5 (@ R12.5)	0	0	0		3	2	0	0	Z		NT, P, Pw, S, W		Potential infill opportunity. Site is unallocated Crown land. Development requires clearance of Native Title, further planning (development plan/subdivision), closure of road. Clarification of width of Simpson Street road reserve required (this lot fronts portion of road reserve which is very wide). Development will also need to consider alignment of possible new entry road (all weather access road). Site is elevated in relation to neighbouring low density residential lots (interface is a key issue). Water Corp infrastructure is adjacent to the site's western boundary. Portion of site could be developed in short term.	
ONS08	G	Lot 643 (CR 25799) & 644 (CR 30686) McRae Place	State of WA	Residential	Public Purposes – Community (Lot 643), Parks, Recreation & Drainage (Lot 644)	Yes (not initiated)		1.05	1      26 (@ R30)	0	0	0		0	26	0	0			L, P, Pw, S, W, Z		Potential infill opportunity. Lot 643 is Crown reserve for aged persons accommodation and lot 644 is Crown reserve for recreation. Reserves are vested to the Shire of Ashburton and are undeveloped. Site is located between the school and recreation precinct - development will need to consider access between these areas and interface with neighbouring uses. Development requires local planning scheme amendment (for lot 644, amendment for lot 643 required if not developed for aged persons housing), lifting of reserve, further planning (preparation of development plan, subdivision). Need to confirm shire's intentions regarding lot 643 (land required for aged persons housing). Options for alternative uses are also being investigated (for example, temporary education facilities). Development will also need to consider road linkages between Hope Court, Paterson and Clarke Place. Project is a short to medium term priority.	

Continued next page



Table 27: Project summaries - Onslow (continued)

Identifier	Land ownership <sup>1</sup>	Location <sup>2</sup>	Existing tenure <sup>3</sup>	Purpose	Zoning / planning			Area / yield <sup>4</sup>			Subdivision approvals <sup>5</sup>				Anticipated release <sup>7</sup> (commencing mid 2011)				Constraints <sup>8</sup>				Comments
					Current zoning	Amendment required / initiated	Other planning under way	Area (ha)	Yield (lots)	Yield (units)	Approvals pending	Current approvals	Lots on non cleared agreements <sup>6</sup>		Short term (0-2 yrs)	Medium term (2-5 yrs)	Medium term (5-10 yrs)	Long term (10+ yrs)	Resolved	Concern but resolution anticipated	Critical but resolution anticipated	Critical and resolution not definite	
ONS09	G	Lot 603 Cameron Avenue (CR 42953)	State of WA	Residential	Residential R12.5/30	No		0.11	1	3 (@ R30)	0	0	0		3	0	0	0	Z		L, P, Pw, S, W		Potential infill opportunity. Site is Crown reserve for recreation vested to Shire of Ashburton (undeveloped). Development requires lifting of reserve, further planning (subdivision). Possible partnership with Department of Housing for development of this site. Development possible in short-term (<1 yr), project is a short term priority.
ONS10	G	Lot 656 Cameron Avenue, Lot 664 Anketell Court (CR 39591)	State of WA (UCL - Lot 656)	Residential	Residential R12.5/30	No		0.34	1	11 (@ R30)	0	0	0		0	11	0	0	Z		L, NT, P, Pw, S, W		Potential infill opportunity. Lot 664 is drainage reserve vested to Shire of Ashburton. Lot 656 is unallocated Crown land. May possibly only be considered as part of broader greenfield planning in order to achieve strategic road links/ drainage requirements.
ONS11	G	Lot 598 Third Street (Leasehold H326902), Lot 696 Third Street (CR 39339), Lot 697 Third Street (CR 40418), Lot 437 Payne Way (CR 26667), Lot 572 Watson Drive	State of WA (UCL - lot 572)	Residential	Public Purposes – Telecommunications	Yes (not initiated)		3.04	1	30 (@ R20)	0	0	0		0	30	0	0			L, NT, P, Pw, S, W, Z		Potential infill opportunity. Site contains key telecommunications infrastructure - liaison with telecommunications providers required (and identification of alternative site). Site is elevated and presents topographical challenges. Development requires lifting of reserve, clearance of Native Title, relocation of infrastructure, local planning scheme amendment, further planning (development plan, subdivision). Site identified as a landmark site, emphasis should be on quality of built form and access to views. Provision of open space may mitigate topographical constraints. Yield based on concept plans. Site considered a medium term priority.
ONS13	G	Lot 899 Watson Drive (CR 42094)	State of WA	Residential	Residential R12.5/30	No		0.21	1	6 (@ R30)	0	0	0		6	0	0	0	Z		L, P, Pw, S, W		Potential infill opportunity. Site is reserve for drainage (reserve is not vested). Reserve status for drainage requires resolution. Development requires lifting of reserve, further planning (subdivision/development approval). Development possible in short-term, project is a medium term priority.
ONS14	P	Lot 447 Third Street	Mackerel Islands Pty Ltd	Tourism	Commercial and Civic	No		0.85	1	58	0	0	0		28	Stage 3 (30 units) - to be determined			Z		P, Pw, S, W		Ashburton Resort Motel (redevelopment of Onslow Mackerel Motel). Stage 1 (20 units) completed late 2010. Stage 2 to consist of 28 units - construction commenced, completion anticipated late 2011. Timing for stage 3 (30 units) to be determined. Project also includes development of bar/restaurant. Local government planning approval is for stages 1 and 2 only. Water connections available for stage 2. Power supply is an issue for stage 2.
ONS15	P	Lot 666 Anketell Court	Mangione J M	Residential	Residential R12.5/30	No		0.13	1	3	0	0	0		3	0	0	0	Z		P, Pw, S, W		Lot sold by LandCorp registration of interest process. Landowner required to build maximum number of dwellings within 30 months of sale. Site has development potential for 3 dwelling (triplex). No subdivision application lodged as at February 2011.
ONS16	P	Lot 926 Otway Court	Hayes G	Residential	Residential R12.5/30	No		0.09	1	2	0	0	0		2	0	0	0	Z		P, Pw, S, W		Lot sold by LandCorp registration of interest process. Landowner required to build maximum number of dwellings within 30 months of sale. Site has development potential for 2 dwellings (duplex).
ONS17	P	Lot 907 McGrath Avenue	Smith K	Residential	Residential R12.5/30	No		0.10	1	3	0	0	0		3	0	0	0	P, Z		Pw, S, W		Lot sold by LandCorp registration of interest process. Landowner required to build maximum number of dwellings within 30 months of sale. Site has development potential for 3 dwellings (triplex). Planning/development approval granted June 2010 (3 dwellings).
ONS18	P	Lot 308 First Avenue	Bartle C R, D K, J R, Cheron Investment Pty Ltd	Tourism	Commercial and Civic	No		0.09	1	9	0	0	0		9	0	0	0	P, Z		Pw, S, W		Planning approval for 9 holiday accommodation units granted September 2010. Development comprises 9 single bed tourist units (5 two storey and 4 single storey). Approval includes condition that development shall not commence (issue of building licence) until a water supply to the requirements of the Water Corporation is available. Development within two years subject to water supply being available.
ONS19	P	Lot 309 Second Avenue	Elberton Developments Pty Ltd, Taplan Pty Ltd	Tourism	Commercial and Civic	No		0.10	1	9	0	0	0		9	0	0	0	P, Z		Pw, S, W		Planning approval for 9 holiday accommodation units granted October 2009. Development comprises 9 single bed tourist units (5 two storey and 4 single storey) (as per lot 308 - ONS18). Unknown if reticulated water service is available to these units. Facilities on lot 308 and 309 to be managed by single manager (manager's unit on lot 309).
ONS20	P	Lot 311 Second Avenue	Rowe B J	Mixed use	Commercial and Civic	No		0.10	1	3 offices (110 m <sup>2</sup> ) + 3 caretaker residences (3 x 3)	0	0	0		3 offices (110 m <sup>2</sup> ) + 3 caretaker residences (3 x 3)	0	0	0	P, Z		Pw, S, W		Planning approval for 3 x 2 storey units (office with residential above) issued September 2010. Offices are approximately 110 m <sup>2</sup> , and dwellings are 3 x 3. Site currently for sale.
ONS21	P	Lot 322 Second Avenue	Boldcity Investments Pty Ltd	Tourism	Commercial and Civic	No		0.10	1	12	0	0	0		12	0	0	0	P, Z		Pw, S, W		Planning approval for 11 holiday accommodation units (2 storey) plus a caretaker's dwelling granted September 2010.
ONS23	P	Lot 381 Third Street	Butler L D, M J, Herbert Mining & Earthmoving Pty Ltd	Residential/ tourism	Tourism	Yes, if project includes residential development (not initiated)		2.37	1	30-40	0	0	0		0	30-40	0	0			P, Pw, S, W, Z		Proposal for residential/tourism uses. Onslow Townsite Strategy states that "in preparing the structure plan, alternate access to Lot 381 and the Water Corporation site be considered. In relation to Lot 381, Council would be prepared to consider a mixed zoning that provided for residential use in the context of an overall tourist/residential development." In-principle support given to initiate scheme amendment (for a mixed zoning that provides for residential use in the context of an overall tourist/residential development) at February 2011 council meeting. Potential yield of 30-40 units. Requires further planning - local planning scheme amendment, subdivision/development approval.

Continued next page



Table 27: Project summaries - Onslow (continued)

Identifier	Land ownership <sup>1</sup>	Location <sup>2</sup>	Existing tenure <sup>3</sup>	Purpose	Zoning / planning			Area / yield <sup>4</sup>			Subdivision approvals <sup>5</sup>				Anticipated release <sup>7</sup> (commencing mid 2011)				Constraints <sup>8</sup>				Comments
					Current zoning	Amendment required / initiated	Other planning under way	Area (ha)	Yield (lots)	Yield (units)	Approvals pending	Current approvals	Lots on non cleared agreements <sup>6</sup>		Short term (0-2 yrs)	Medium term (2-5 yrs)	Medium term (5-10 yrs)	Long term (10+ yrs)	Resolved	Concern but resolution anticipated	Critical but resolution anticipated	Critical and resolution not definite	
ONS24	G	Lot 649 Hope Court	State of WA (UCL)	Residential	Parks, Recreation & Drainage	Yes (not initiated)		0.60		20 (@ R30)	0	0	0		5	15	0	0			L, NT, P, Pw, S, W, Z		Potential infill opportunity. Site is unallocated Crown land. Development requires clearance of Native Title, local planning scheme amendment, preparation of development plan (for broader area). Site has difficult topography. Development will need to consider interface with existing residential uses. Portion of site could be developed in short term.
ONS26	G	Lot 974 & 975 Simpson Street	State of WA (UCL)	Residential	Urban Development	No		0.81	1	19	0	0	0		0	19	0	0	Z		NT, P, Pw, S, W		Potential infill opportunity. Site is unallocated Crown land. Development requires clearance of Native Title and further planning (preparation of development plan (for broader area), subdivision). Clarification of width of Simpson Street road reserve required (these lot front portions of road reserve which is very wide). Road linkages, drainage and interface with existing residential uses to be considered in this area. Area should be considered as part of broader greenfield planning. Site may have potential contamination from historical uses. Site is medium term priority.
ONS27	G	Lot 570 Forrest Court	State of WA (UCL)	Residential	Parks, Recreation & Drainage	Yes (not initiated)		0.31	1	16	0	0	0		5	11	0	0			NT, P, Pw, S, W, Z		Potential infill opportunity. Site is unallocated Crown land. Development requires clearance of Native Title, further planning (subdivision), closure of road and local planning scheme amendment. Clarification of width of Simpson Street road reserve required (this lot adjacent to portion of road reserve which is very wide). Development will also need to consider alignment of possible new entry road (all weather access road). Potential to connect existing culs-de-sac with Simpson Street. Development should consider surrounding land parcels to achieve improved development outcomes. Boundaries of development sites in this area may need to be rationalised. Portion of site could be developed in short term.
ONS28	G	Crown land Hooley Avenue	State of WA (UCL)	Residential	Urban Development	No		0.12		3 (@ R30)	0	0	0		3	0	0	0	Z		NT, P, Pw, S, W, Z		Potential infill opportunity. This are could be developed in short-term. Requires clearance of Native Title.
ONS30	P	Lot 915 & 916 McGrath Avenue, Lot 917 & 918 Payne Way	Onslow Salt Pty Ltd	Residential	Residential R12.5/30	9/7/20119/7/2011		0.32	4	8	0	0	0		8	0	0	0	Z		P, Pw, S, W		Onslow Salt lots. Potential for 8 dwellings.
ONS31	P	Lot 561 Beadon Creek Road (CR 30711)	State of WA	Marine support/ service industrial	Public Purposes - Port Facilities	No		8.04	8 ha - number of lease areas unknown		0	0	0		8 ha	Stage 2 (~100 ha) - subject to demand			Z		Pw, W		Proposals sought by DoT for lease of unimproved land at Beadon Creek in mid 2010. Sites to be leased for uses related to the provision of marine and harbour related services. Proposed lessees responsible for service upgrades etc. Stage 2 (~100 ha east of Beadon Creek) may be released subject to demand.
ONS32	P	Lot 865 Maunsell Corner	Elberton Developments Pty Ltd	Residential	Residential R12.5/30	No		0.11	1	3	0	3	3		3	0	0	0	P, Z		Pw, S, W		Development approval for 3 grouped dwellings (May 2011). Conditional approval to create 3 survey strata lots granted July 2011.
ONS33	G	Lot 318 Second Avenue	Shire of West Pilbara	Residential	Commercial and Civic	No		0.10	1	3	0	0	0		3	0	0	0	P, Z		Pw, S, W		Construction of three residential dwellings (3x2) for purposes of staff housing. Tenderer appointed in April 2011.

<sup>1</sup> G = government, P = private  
<sup>2</sup> CR = Crown reserve  
<sup>3</sup> UCL = unallocated Crown land  
<sup>4</sup> In some cases the yield for the project is indicative only. Final lot/dwellings yields will be determined by further detailed planning.  
<sup>5</sup> Refers to the number of lots/units with current subdivision or strata approval, and the number of lots/units for which a subdivision/strata application has been lodged but which is yet to be determined (pending). Does not include local government development approvals. As at 31 July 2011.  
<sup>6</sup> Refers to conditionally approved lots where a servicing agreement (agreement to construct) has been signed between the Water Corporation and the developer. This gives further indication of lots likely to become available to the market in the short-term. As at 31 July 2011.  
<sup>7</sup> In some cases the anticipated release of lots is yet to be determined. This could be for reasons such as market conditions, demand/supply of services or a requirement to resolve issues and constraints.  
<sup>8</sup> Constraints and issues codes: Environmental (E), heritage (H), land assembly (L), native title (NT), planning (P), power (Pw), sewer (S), water (W) and zoning (Z).

## 7 Infrastructure

### Key points

- Power, water and wastewater infrastructure are currently operating above capacity or will soon reach capacity. Significant infrastructure investment is required to meet current land and housing demand pressures. Even with business as usual, there is a restriction on development and building activity due to limitations of utility infrastructure capacity that needs immediate attention.
- Much of the required funding has not yet been secured by the responsible service agencies.
- Improving the liveability of regional centres through investment in community infrastructure is a key feature of the Pilbara Cities blueprint. Development of the Ashburton North Strategic Industrial Area (ANSIA) will place higher demands on already limited social and related infrastructure.
- Shared infrastructure provides the means to encourage economic development beyond the initial proponents and enables the use of scale and redundancy to maintain a level of security of supply to all participants that isolated systems cannot provide.
- It is a well established principle that development should contribute to funding towards the provision of infrastructure that is generated by that development. In the case of the ANSIA, the main impacts in terms of demands for additional services and facilities are remote from the ANSIA site in the Onslow townsite. A State Development Agreement between the State and foundation proponents to develop hydrocarbon processing industries in the ANSIA will, among other things, bind all proponents to a plan to properly manage the equitable funding and orderly delivery of community services and facilities.
- Provision of infrastructure to service the anticipated development growth will require significant funding and improved coordination from government, major foundation proponents, agencies and service providers.

- The extent of physical and social infrastructure demand requirements for the Onslow townsite greatly depends on the certainty of major projects, the residential nature of operational workforces (that is FIFO or residential based), the family status of operational workforces and associated key service workers and contractors, directly or indirectly resulting from the operation of the major projects.

### Actions and priorities

- Upgrades to power, water and wastewater services are critical for land development and are required in the short term.

This publication identifies existing and planned physical and social infrastructure in Onslow, together with current use and capacity where possible. Some attempt has been made to inform of current and possible future infrastructure shortfalls at a high strategic level only and in no way intends to usurp the responsibility of individual agencies and providers in their service and facility forward planning.

A collaborative approach based on common agreed employment and population forecast scenarios is required to arrive at a detailed infrastructure needs analysis followed by a coordinated implementation plan.

Table 31 in section 7.13 – Infrastructure summary provides a summary of infrastructure needs for Onslow together with indicative costs.

The cost estimates detailed in this section reflect the best available estimates at the time of writing. Note that in many cases, these are initial estimates only which will likely change as further detailed planning and design is progressed.

While the *Onslow Townsite Strategy* provides an investigation of future options, the key issue of infrastructure provision to service population growth needs to be addressed. At present, the Onslow townsite does not have sufficient service capacity (particularly water, power, and wastewater) to permit development of new lots to meet potential demand scenarios outlined in the *Onslow Townsite Strategy* and in some instances is unable to meet service demands of existing development and zoning.

DSD is leading the process of identifying infrastructure requirements, in consultation with the Shire of Ashburton and key State agencies. As well as significant proponent contributions to infrastructure, it is anticipated that State and federal funding will also be required to prepare Onslow for the growth scenarios presented in this document.

Much of the following information relating to infrastructure needs and estimated costs is sourced from Chevron Australia's *Wheatstone Project Ashburton North Strategic Industrial Area Social Impact Statement* and the Department of State Development's draft *Ashburton North Strategic Industrial Area Analysis of Infrastructure and Key Issues and Infrastructure Requirements* – Onslow reports.

Various infrastructure needs have been identified using a range of different population and employment scenarios and, therefore, some level of caution must be exercised when using this information in some instances. In addition, a number of cost estimates are preliminary as projects may not have been established yet.

The DSD is; however, currently working with other agencies to develop an infrastructure needs analysis based on agreed common population and employment growth scenarios.

Information reported in this document is sourced from latest available data; however, infrastructure needs may change with the outcome of further interagency work.

### Wheatstone infrastructure package

On 26 September 2011, Premier Colin Barnett announced details of an infrastructure package negotiated as part of an agreement between the State Government and Chevron Australia to enable the development of the Wheatstone project, which will result in new community and public infrastructure and services potentially worth more than \$250 m.

Chevron Australia will build a new gas fired power station and desalination plant to meet Onslow's power and water supply needs and will give \$20 m towards a community development fund (CDF) that will include a \$10 m Royalties for Regions contribution.

In addition, Chevron Australia will spend \$66 m towards community infrastructure including:

- upgrading the airport and a new ring road;
- visitors' centre, library, customer service centre and council chambers;

- community swimming pool;
- town planning beautification; and
- heritage conservation, tourism development and a new picnic spot.

A further \$120 m will be provided by Chevron Australia for:

- upgrades to Onslow Road;
- waste and wastewater management;
- upgraded health, school and emergency services facilities;
- additional houses for government employees; and
- contribution to new land development costs.

## 7.1 Water

The existing water supply network is shown on Map 7.

Onslow is supplied with potable water by the Water Corporation, sourced from the Cane River alluvial aquifer located approximately 30 km east of Onslow. It comprises 15 production bores and is licensed to draw 0.35 gigalitres per annum (GL/a) of water.

The source has been proclaimed as a water reserve under the *Country Areas Water Supply Act 1947* and a water source protection plan has been prepared to reduce the risk of contamination from diesel, fuel, herbicides and cattle. Special control areas exist over the Cane River Water Reserve and the borefield within the Shire of Ashburton's *Town Planning Scheme No. 7*. Water is treated at the borefield and conveyed to the Onslow townsite via a 200 mm diameter distribution main (that runs through the airport). Water is stored in three water tanks of varying capacity within the town, including two pressure tanks (0.25 megalitres (ML) ground tank and 0.1 ML elevated tank) and a ground storage tank (2.3 ML). Long term planning by the Water Corporation to support the growth of Onslow is based on a more robust water distribution concept which should improve water pressures in existing low pressure areas and improve security of supply.

The Onslow Water Supply Scheme is currently operating close to full capacity, drawing 0.31 GL (and supplying 370 services) from the source in 2009/10. While meeting all current service obligations, the Water Corporation at this stage cannot guarantee the availability of water and wastewater services for additional connections.

Lack of availability of water connections has impeded land and housing development, even on land that is suitably zoned and otherwise development ready. In December 2010, a number of additional water service connections was made available in Onslow; however, this will only assist with a minimal amount of immediate short-term residential development.

Drilling investigations to expand the Cane River borefield to support additional growth in Onslow commenced in August 2010 and the first stage of investigations are now complete. Four additional production bores have been identified as part of the investigations for connection to the water supply scheme, potentially supplying an additional 0.2 GL per year. A booster pump station and upgrading of the transfer pipeline is also

required to transfer the water into town. Additional pipelines, storage tanks and a booster pump station will need to be constructed in the town by 2015 to meet increased demand. Some further expansion of the Cane River source may also be possible.

Although the infrastructure program is expected to allow for an approximately 50 per cent increase in residential and small business connections, the Cane River source will need to be further expanded or a new water source identified and developed to service townsite growth beyond this capacity. Further drilling investigation will be required to confirm the viability of further expansion of the Cane River source (ultimate capacity estimated to be around 0.9 GL/a) and any requirement above this is likely to require a new source. Planning for this level of source expansion is yet to be undertaken.

The Water Corporation is also currently undertaking an \$11.2 m water efficiency program in the Pilbara, (with support from the Australian Government under the National Water Security Plan for Cities and Towns) for all residential, industrial and commercial customers to reduce water use and ease immediate water supply pressures. Water efficiency work has already commenced in Onslow with leak detection work completed in August 2010. Repair of leaks will be completed shortly, with the total water savings estimated at 7000 kilolitres (kL). The Shire of Ashburton has also signed up to become a Waterwise Council to improve effective use of potable water within the townsite.

Investigations are underway to explore the treated wastewater reuse and water efficient opportunities including use of grey water for the Shire's open spaces which will return around 0.1 GL/a in potable water savings. Currently the oval in Onslow requires approximately 20,000 kL of reticulated water annually to retain acceptable grass coverage for sport use. Additionally, approximately 7000 kL of reticulated and hand watering is used to maintain street trees annually throughout the townsite. The Shire of Ashburton is investigating the potential of sourcing ground water in the town area as an alternative to potable water for maintaining the oval, public reserves and trees.

### Future requirements and planning

Future water demand in the Onslow area will be predominantly shaped by the employment and population impacts associated with the development of the ANSIA.

The Department of Water has undertaken analysis of population projections and identified future resource projects to calculate low and high water demand scenarios for Onslow. Under a low growth scenario (that is 30 permanent residents in Onslow by 2013 – Macedon project only), water demand could be met by the Water Corporation's expansion of the current scheme. Under a high growth scenario (that is residential population growth being located in the townsite as a result of the Macedon and Wheatstone projects, operational workers camps being established for 75 per cent of the projects' workforces, additional indirect/consequential workers and families, 5 per cent industry growth in the town), it is likely that by 2015 demand for town water supply would be in excess of what can be met by expansion of the current source and would need to be supplemented via an alternative source, such as desalination at an appropriate location.

The commencement of LNG processing activity at the ANSIA will also have significant implications for water demand. Water to service workers and industry locating in the ANSIA cannot be met from the Onslow Water Supply Scheme so identification of alternative sources is required. It is currently expected that the main proponents (BHP Billiton Petroleum and Chevron Australia) will be self sufficient at the ANSIA. Water supply for industrial and support industries is yet to be determined.

The Department of Water has assessed that there is some limited yield potential for the existing Cane River borefield to supply additional scheme water; however, the borefield is currently considered to have an ultimate capacity that may not satisfy a high demand growth scenario. The Water Corporation is finalising its aquifer assessment, application for additional water (increase in the water allocation from 0.35 GL/a to 0.55 GL/a) and planning for additional infrastructure. Along with efficiency upgrades, the scheme expansion is expected to service the water supply needs of an approximately 50 per cent increase in population (or number of standard water service connections).

The *Pilbara Planning and Infrastructure Framework* includes identification of a new water source to service Onslow as one of its 2015 utility infrastructure priorities. The Water Corporation is investigating various longer term water supply options, including development of a seawater desalination plant, further expansion of the Cane River borefield (through further investigative drilling) and potentially the Lower Robe River alluvial aquifer.

Seawater for a desalination plant could be acquired via a pipeline extending into the ocean. Discharge options require investigation. The plant could also be accommodated on a site adjacent to the new water supply tank close to the airport. An additional benefit of this proposed site is the servicing of proposed industrial land near the airport, which would not otherwise be able to be serviced by the Water Corporation.

Other longer term options include the sourcing of water from third parties, including the resources sector, which will likely source and fund their own water supply needs. The State is continuing to liaise with proponents of prospective resource projects to address the issue of water supply to meet expected industry and the town site demand. Access to water to service industrial activity and residential growth in the townsite is a key issue that will require significant negotiation and coordination between the State, local government and the proponents if an appropriate outcome is to be achieved. Significant cost savings and a reduced environmental impact could be achieved if a single desalination plant was established to service both occupiers of the ANSIA and Water Corporation customers. If multiple plants are established however, there may be opportunities to share some of the infrastructure, including inlet and outlet pipes.

Identification of a new water source is critical to support proposed urban development in Onslow for 2015 and beyond. The Water Corporation is currently planning a staged water supply upgrade to meet anticipated future demand. The expansion of the Cane River borefield (stage one) has commenced (including a booster pump station and upgrading of the transfer pipeline), and is expected to be completed in 2013. These works are funded under the Water Corporation's capital works program. Further stages may include construction of a desalination plant and associated infrastructure, further expansion of the Cane River borefield, or a combination of both of these sources.

Planning is under way for construction of a 2 ML/d desalination plant and additional storage tanks. A desalination plant would also involve significant operating costs. Development of this

infrastructure has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project.

Further detailed planning and design work for these projects would need to commence in the short term in order to meet anticipated increased demand by 2016/2017. Land will need to be identified with appropriate tenure and approvals to site any significant new infrastructure. Environmental approvals would also need to be obtained.

## 7.2 Drainage and flooding

The Onslow townsite's geographical position and landform characteristics pose some natural drainage and storm-surge problems which are exacerbated by regular cyclone activity.

Drainage is primarily the responsibility of the Shire of Ashburton. *Town Planning Scheme No. 7* notionally identifies the flood-risk areas by a special control area known as the Onslow Coastal Hazard Area. This applies to all land up to four metres AHD in the coastal zone and five metres AHD in the frontal dune area of the townsite, between Four Mile Creek and Beadon Creek whereby building floor levels and uses are controlled to mitigate against flood risk and to protect natural systems.

In the process of rationalisation of land parcels in seeking additional land for development, it is important to ensure that drainage reserves are not inadvertently removed or impacted without other arrangements being in place to address drainage needs.

Two significant storm-surge studies and investigations have been undertaken for the Onslow district. These are *Onslow Storm Surge Study* (Halpern Glick and Maunsell, 2000) and *Onslow Foreshore Investigations* (MP Rogers, 2002). During the review of the *Onslow Structure Plan* consultants GHD reviewed these studies together with two independent sources dealing with flood risk in the region. It was found that flood levels significantly varied between the different modelling and that the earlier modelling did not take into account the impact of global climate change.

Furthermore, Geoscience Australia and FESA conducted tsunami impact modelling for Onslow as part of providing *Professional Opinion 2007/07: Tsunami Impact Scenarios for the North West shelf, Western Australia*. This report supported the emerging need to conduct more detailed modelling of the coastal processes impacting the Onslow coastline.

The *Onslow Townsite Strategy Background Report* also identifies the need to undertake an additional coastal vulnerability assessment work for Onslow.

## 7.3 Wastewater

The existing wastewater network is shown on Map 8.

The Onslow wastewater treatment plant (WWTP) has a treatment capacity for 1000 equivalent population, estimated at 460 kL/d. The plant is licensed to treat 200 kL/d which was previously considered sufficient to cater for natural growth in the town. The plant's disposal capacity is estimated at 290 kL/d by way of two infiltration areas. There is capacity to support some population growth, with the wastewater flow currently at 180 kL/d.

The plant is located two kilometers south of the town centre, south of Macedon Road. To protect the facility from encroaching land uses, the facility has a nominal 500 m odour buffer.

The current location of the facility has considerable impact on the potential for residential expansion, constraining westwards development in this area. Additional development in Onslow may require expansion of the treatment ponds and would be subject to an odour-risk impact assessment. If the town experiences significant growth in the longer term, the treatment plant may require relocation.

The Water Corporation currently operates one wastewater pump station, located on McGrath Avenue. There is also an existing private pump station at the Bindi Bindi community.



### Bindi Bindi wastewater treatment plant

The Bindi Bindi Community is serviced by its own effluent treatment ponds which are separate to the main town wastewater treatment facility operated by the Water Corporation. The Bindi Bindi facility is located on Reserve 39155 (for the purpose of sewage treatment plant), some distance from the community in an area identified for future urban development. A management order for this reserve was issued in 1990 in favour of the Bindibindi Community Aboriginal Corporation. This corporation was deregistered in October 2009 according to the Office of the Register of Indigenous Corporations records, presenting some difficulties in establishing the body responsible and its intended future. The care and maintenance of the Bindi Bindi wastewater facility is currently subcontracted to the Port Hedland based Pilbara Meta Maya Aboriginal Corporation through Parsons Brinkerhoff (under contract with the DoH).

A strategy action of the *Onslow Townsite Strategy* is to decommission the Bindi Bindi wastewater treatment plant. In the interests of efficiency of land and infrastructure, the community could then be connected to the Water Corporation facility which would allow for urban expansion in this area. Any additional flow into the Water Corporation facility as a result of decommissioning the Bindi Bindi plant is likely to involve expansion.

The Water Corporation is aware of the proposed decommissioning of the Bindi Bindi WWTP and that flow is being considered in its planning.

### Future requirements and planning

Current flow forecasts indicate that the current treatment capacity will be exceeded in 2016/17, and the disposal capacity exceeded in 2013/14. An upgrade is required to meet increased demand associated with population growth and possibly additional flows from the Bindi Bindi community, following the decommissioning of the Bindi Bindi treatment plant.

The Water Corporation indicate that an expansion to the pond system will be required, which will need to be operational by 2016. This will increase treatment capacity to 920 kL/d. Two additional infiltration basins are also required and will need to be operational by 2013, with a further basin required by 2016. This will increase disposal capacity to 740 kL/d.

Further expansion of the pond system and infiltration basins will be required by 2022 should anticipated population growth be realised.

Decommissioning of the Bindi Bindi WWTP will involve rerouting the pumping station and 550 m of sewer line. The site will also need to be remediated.

Consideration needs to be given to the possibility of additional land requirements and extension of odour buffers when planning for expansion and/or relocation of wastewater treatment facilities. In the case of the Water Corporation WWTP, it is not anticipated that an increase in the size of the odour buffer will be required.

In terms of wastewater conveyance, seven additional pump stations are proposed to serve the proposed urban expansion. An upgrade to the existing Water Corporation pump station is also required. Timing for the construction of the pump stations (pre-funded by developers) will depend on the rate of land development, but it is anticipated that two pump stations will be required by 2016.

A wastewater reuse system could also potentially be established, which would assist with disposal capacity. Treated wastewater could initially be used to irrigate the town oval, with additional opportunities potentially arising as further development occurs. A reuse system will include a filter, chlorination facility, conveyance infrastructure, pump stations and a storage tank.

Upgrading of the existing wastewater treatment plant to a capacity of 920 kL/d and connecting infrastructure from the town to the plant has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project.

## 7.4 Power

Existing power network is shown on Map 9.

### North West Integrated System

The North West Integrated System (NWIS) provides power to a number of towns and settlements within the Pilbara region. The four parties involved with owning and operating the NWIS are Horizon Power, Pilbara Iron, Alinta and BHP Billiton Iron Ore. The NWIS has grown, since the early 1970s, when iron ore mining companies installed generation and transmission systems to meet the needs for electricity for their own purposes. These stand-alone, or island systems were finally interconnected, in 1985, by Western Power infrastructure to serve residential communities and commercial customer requirements.

There is currently a significant amount of underutilised generation capacity in the Pilbara due to the number of self generation facilities that are not articulated to interconnected networks. If these assets could be accessed to make more efficient use of existing capacity, it is likely that that less new generation investment would be required to transport the electricity to load centres. Realisation of an integrated electricity system would require significant investment and cooperation between multiple stakeholders, which would rely on the development of strong commercial rationale.

The NWIS now serves the Pilbara communities of Dampier, Wickham, Pannawonica, Paraburdoo and Tom Price through the Pilbara Iron Network and Port Hedland, South Hedland, Karratha, Roebourne and Point Samson through the Horizon Power Network.

### Onslow power supply

The Onslow power supply is independent of the NWIS and there are no proposals to include it in the system at this time.

Electricity is provided for Onslow by a 3.6 megawatt (MW) (installed capacity) gas engine turbine power plant operated by Onslow Electric Power (OEP), a privately owned independent power producer. This is located on the Onslow Salt mining lease area southwest of the townsite and west of the wastewater treatment plant. A 2000 m buffer extends around the power station to provide for a noise level exclusion zone. The plant is connected to Dampier to Bunbury Natural Gas Pipeline through BHP Billiton

Petroleum's gas lateral to the Tubridgi facilities and then via a Horizon Power pipeline to the power station. The plant's capacity is augmented by Horizon Power's 3 MW emergency diesel generators provided with 15 days of fuel supply.

The total reliable generation capacity available to Horizon Power is approximately 4.2 MW (combining gas and diesel). The current Horizon Power load at Onslow is in the order of 2 MW.

The OEP plant used to supply 60 per cent of its output to Onslow Salt, however this is now reduced to 50 per cent. The remaining 50 per cent is supplied to Horizon Power, which distributes this power to the Onslow township via an 11 kilovolt (kV) overhead network. This reduction has occurred over the past 12 months due to increased demand for power in the townsite. The contracts between OEP and Horizon Power are due to expire in November 2014.

The peak load capacity available to Onslow Salt is insufficient for its requirements during very hot conditions when the OEP plant generation capacity is reduced by up to 50 per cent. This has caused occasional Onslow Salt operations shut downs when ship loading and prompted Onslow Salt to install its own 1.5 MW backup generator in addition to Horizon Power's emergency generators. Anecdotal evidence suggests that power interruptions occur within the town on a fairly regular basis, mostly occurring in the wet season during poor weather conditions.

Funding has been allocated under the Pilbara Revitalisation Plan (Royalties for Regions) to install underground power in Onslow. This will enhance amenity, improve system reliability and network performance through cyclone proofing and reduced maintenance costs. The project is anticipated to commence in early 2012 and be completed within that same year. It is understood that the project will include all developed areas within the townsite, including the Bindi Bindi community and the Beadon Creek industrial area. It is not clear as to the possibility of also undergrounding the main power distribution line from the power station. Some consideration/contingency may be required for underground power within the town centre to dovetail in with the town revitalisation project currently underway.

### Future requirements and planning

Horizon Power's contracted capacity to supply the Onslow community will require augmentation to support both current and future demand in Onslow. The *Pilbara Planning and Infrastructure Framework* also identifies expansion of power generation in Onslow as one of its 2015 utility infrastructure priorities.

For the ANSIA, it is the foundation proponents' preference for power not to be imported from the local grid, rather that each proponent be responsible for their own power requirements with independent power generation and distribution systems. Primary power supply is likely to be provided by a series of gas turbine driven generators, with separate diesel generator units for outages and emergencies. Diesel generators will be used until gas fired power generators are ready for operation. The proponents would be responsible for the supply of gas for their own operations from a co-located domestic gas plant within the common user coastal area, fed from natural gas supplies from offshore fields. This plant will also connect to the Dampier to Bunbury Natural Gas Pipeline by an onshore pipeline.

Shared infrastructure provides the means to encourage economic development beyond the initial proponents and enables the use of scale and redundancy to maintain a level of security of supply to all participants that isolated systems cannot provide.

Horizon Power has held discussions with BHP Billiton Petroleum (Macedon) and Chevron Australia (Wheatstone) regarding provision of power to their construction camps and facilities. Although their intention is to provide for their own needs for these activities, Horizon Power remains prepared to discuss supply options with the proponents for these loads.

An Onslow power planning study is due for completion at the end of May 2012 and forms part of the annual asset management planning cycle. The strategy to be developed for Onslow will depend on the outcomes of this study. At present, the following additional future power requirements (to 2025) have been identified:

- Onslow townsite – to cater for anticipated population growth an additional 6 MW of power will be required to 2016. A further 7 MW will be required prior to 2022. A further 0.5 MW of demand is anticipated for the

recreation centre upgrade and an additional 1.5 MW to cater for natural load growth to 2025.

- Onslow Salt – a proposed new washing plant will increase power requirements by approximately 0.8 MW.
- General industrial lots – 60 additional industrial lots may require in the order of an additional 17 MW of power.
- Desalination plant – it is estimated that a plant may require 2.5 MW of power (depending on type and capacity).

Therefore, an additional 35 MW may be required in Onslow by 2025. Horizon Power is currently considering options, including replacement of existing generation units at the existing site; however, capacity of the existing gas pipeline and land availability at the existing site will need to be considered. Investment in additional distribution network infrastructure will also be required to ensure the provision of an adequate electricity supply to proposed urban expansion areas.

Planning is under way for a new 9 MW capacity (capable of being expanded) power station and gas lateral, to be owned and operated by Horizon Power. This will also include the provision of adequate water and gas infrastructure to the power station site, construction of a suitable zone substation at the townsite and circuit transmission to deliver electricity from the power station to the perimeter of a designated zone substation at the townsite. Development of this infrastructure has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project.

## 7.5 Transport

Existing transport networks are shown on Map 10.

### Onslow Road

Vehicular access to Onslow is via Onslow Road, an 80 km branch off the North West Coastal Highway (NWCH). Onslow Road was built in the 1980s to service the Onslow community and Onslow Salt, and is managed by Main Roads Western Australia (to Beadon Creek Road intersection).

Onslow Road traverses a number of low level floodways and is prone to flooding in cyclonic and storm related events, severing the Onslow townsite from evacuation or emergency support by road in an extreme event. This also affects access to the airport, making evacuation/support by air uncertain.

As resource developments proceed within the ANSIA, large sections of Onslow Road will need to be improved between the town area and the NWCH, in particular the section between the proposed ANSIA access road intersection and NWCH. While the road is considered adequate for current uses, it will not be the case when rapid expansion of industry occurs. An increase in heavy vehicles is predicted for this link, which is likely to include additional traffic servicing the ANSIA from Beadon Creek Harbour and from the natural resource tenements in that vicinity, as well as traffic between the ANSIA and NWCH.

There are some substandard curves and a narrow seal width (8.6 m pavement with 6.2 m seal), which is an issue for wide heavy loads. The road pavement was built with a 20-year design life and is now showing signs of deterioration on some sections indicating a need to upgrade major sections of Onslow Road in the short to medium term.

Access to the ANSIA will be via a 20 km access road off Onslow Road. This will service the accommodation village and plant sites before continuing through to the port. The draft ANSIA structure plan identifies both western and eastern multi-user access and infrastructure corridors, which have been designed to accommodate the various requirements for transport and transmission of utilities/products within the ANSIA. The alignment of these corridors is still being negotiated. Secondary access roads have also been identified in the draft structure plan.

Cost estimates have been prepared for the upgrade of Onslow Road. These include widening of the existing pavement by 3.3 m with 2.8 m of additional seal and 0.5 m of unsealed shoulder on the left hand side heading west (67 km). In February 2011, the State Government announced a \$755,000 contract to design and document the widening of Onslow Road and a 14 km section of NWCH. Design work is expected to be completed around September 2011. This work will provide a more accurate estimate of the cost to upgrade the road. Subject to funding, commencement of road upgrade works could commence in early 2012.

Contribution towards the upgrade of Onslow Road has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project.

### North West Coastal Highway (NWCH)

The NWCH and Brand Highway form a major freight route between Perth and the northwest of the State, providing a link between the regional centres of Geraldton, Carnarvon, Karratha and Port Hedland. The highway is managed by Main Roads Western Australia.

In addition to proposed industry expansion and resource project development in the northern Gascoyne and western Pilbara, it is anticipated that the development of the ANSIA will generate a spike in heavy vehicle movements on the NWCH, especially during the construction phase.

Main Roads Western Australia have identified a number of projects to upgrade the NWCH, with total costs estimated at \$290.5 m. These works include:

- seal shoulders between Yannaria River and RA3 boundary (\$8.4 m)
- seal shoulders between Overlander and Wooramel roadhouses (\$5.8 m)
- Peedamulla Creek bridge, Peedamulla East Creek bridge and Toolunga Creek bridge (\$45.8 m)
- widen and seal Minilya to Barradale (\$191.5 m)
- Cave Creek bridge and Goodeman Creek bridge (\$39 m)

Design work to widen and seal the highway between the Minilya Exmouth Road-intersection to Barradale was included as part of a \$755,000 contract announced in February 2011. Funding for these projects has not been allocated and is subject to a submission to Infrastructure Australia.

### Ring road

The need to create an all-weather sealed link between the townsite and the airport has been identified since the preparation of a structure plan by the Department of Land Administration in 1985. This requirement has been supported by the Shire of Ashburton since this time and is considered essential in future planning for any expansion of Onslow. The road may also act as a levee, further protecting the townsite from flooding.

To address this, the Shire of Ashburton is investigating the realignment of Onslow Road to provide an alternative entry approach to the townsite, approximately three kilometers south of the current intersection with Beadon Creek Road. The road is proposed to deviate northwards from near the airport, sweeping around behind the town and terminating at the Beadon Point end of the town centre. In addition to providing all-weather access, the new road will also act as a physical buffer between Onslow Salt activity and future urban development (noise, light and storm-surge mitigation) and provide improved access to the existing and future urban expansion area. The road will also act as a bypass to the existing industrial area.

The new road alignment concept has been identified within the *Onslow Townsite Strategy* and some initial survey work has been undertaken by the Shire; however, this project is still in early stages of design. Further progress will be influenced by more detailed investigations such as coastal vulnerability data and incorporation of a levee, route identification and access points, buffer requirements for Onslow Salt and the wastewater treatment plant.

The estimated cost for this road deviation is in the order of \$5 - 7 m, and the Shire of Ashburton is currently investigating various funding options for the remainder. As part of a social infrastructure package negotiated with the Shire of Ashburton for the Wheatstone project, Chevron Australia will contribute funds (estimated by the Shire at \$3 m) towards the Onslow Ring Road. It is anticipated that construction will commence in the second half of 2012.

### Peedamulla Road

Peedamulla Road provides an alternative unsealed access to the NWCH in order to travel northwards. The sealing of this road would reduce travel time to Karratha by approximately 30 minutes (reduced distance of 50 km), allowing for more reasonable access to higher order services and facilities (including essential health services) in the more major centres to the north. The road would also improve access to the Cane River borefield and Cape Preston. Peedamulla Road is a local road under the responsibility of the Shire of Ashburton. The works cost estimate for this road is \$42 m (59 km road with 10 m pavement) and funding has not been allocated.

Twitchen Road is a local road, which provides an alternative, but unsealed link from Onslow Road to the highway although this is not accessible at all times of the year. The road also provides access to local cultural and recreational areas at the Ashburton River and Old Onslow townsite, as well as access to the now defunct onshore gas facilities at Tubridgi (on Urala Station).

### Onslow airport

The Onslow airport is located approximately 5 km from town. The 529 ha site comprises of two 30 m wide runways of 1600 m and 990 m in length, the levels of which were raised in 2002/03 to reduce the risk of flooding. A further upgrade was completed in 2007 when the airstrip was sealed and reinforced. The airport is currently a fully certified airport under the Civil Aviation Safety Authority standards.

Due to its length and strength, the use of the main runway is restricted to code 3 aircraft (Fokker 50), meaning that it is not suitable for large passenger aircraft. Further strengthening, sealing and extension of the runway to at least 2000 m would be required to accommodate large aircraft such as Boeing 717s or 737s.

For regular passenger services, Onslow is currently served by Karratha airport located some 335 km by road to the north east. Karratha provides 73 scheduled regular passenger services per week mostly to Perth with some interstate scheduled services also operating weekly to Brisbane, Sydney and Melbourne and twice weekly to Darwin (as at August 2010).

Development of the ANSIA will increase demand for higher volume air traffic for transport of equipment and workforces and will be highest during construction phases of the LNG projects (estimated 3300 - 5300 construction workers for Wheatstone and Macedon projects between 2011 and 2017). It is also anticipated that approximately 75 per cent of operational workforces directly related to those projects alone will be employed on a FIFO basis (estimated 250 persons from 2013).

The Shire of Ashburton owns the Onslow airport site in fee simple and is responsible for any upgrading, with possible funding contributions from proponents. The Shire of Ashburton previously considered relocation of the airport as an alternative to upgrading (cost estimated at \$35 - 50 m); however, in mid 2010 it resolved not to pursue this option.

The extent of any upgrade and timing is yet to be finalised; however, the Shire of Ashburton has endorsed the *Onslow Airport Master Plan* as a guide for the expansion and development of the Onslow airport land and has allocated funds of \$100,000 towards the airport upgrade and associated planning/consultant fees. The master plan shows one lengthened and widened runway, a new terminal and car park, nine new lots for airport use only, 23 lots for general aviation and 86 lots for light industry.

As part of a social infrastructure package negotiated with the Shire of Ashburton for the Wheatstone project, Chevron Australia will contribute funds towards the upgrade of the airport to accommodate larger passenger aircraft (estimated by the Shire at \$30 m).

The Shire of Ashburton called for expressions of interest in the Onslow Airport Enterprise Centre in March 2011 and also resolved to initiate amendments to the Shire of Ashburton *Town Planning Scheme No. 7* to rezone portion of the airport land from Public Purposes Reserve (Airport) to Mixed Business to allow for future development (*Amendment No. 15 and No. 16*).

In December 2010, the Shire of Ashburton resolved to request the DoT to include Onslow as a deregulated Regular Passenger Transport Service route (RPT) on the proviso that the airport is upgraded to sustain the service.

The southwest corner of the airport site is affected by a number of Onslow Salt tenements and a water pipeline easement (for a 200 mm diameter distribution main) traverses the site, crossing one of the runways and through a number of freight/logistics and light industrial lots proposed in the master plan.

Under the Shire of Ashburton local planning scheme, the Onslow Airport Height Restrictions Area Special Control Area extends outwards from the runways to restrict building heights within flight path areas. These may need to be increased and changed in the event of any airport upgrading and may further impact on land within the proposed future urban expansion area.

The Shire of Ashburton local planning scheme also shows the Onslow Strategic Industrial Buffer Special Control Area affecting approximately two thirds of the airport site. This is proposed to be removed under an amendment to the local planning scheme (*Amendment No. 11*, advertised for public comment August 2011) as the existing strategic industrial area is to be rezoned to Rural.

## Beadon Creek Maritime Facility

The Beadon Creek Maritime Facility is located within Reserve 30711 which is designated for "Harbour Purposes" and is managed by the DoT. The Beadon Creek area is currently not particularly developed; however, the facility includes:

- 88 m of public wharf
- 12 tenanted (marine industry associated) lease sites
- cyclone moorings
- fuelling facilities located on the public service wharf
- public boat ramp (responsibility of the Shire of Ashburton)
- public carpark for boat ramp users (responsibility of the Shire of Ashburton)
- fish cleaning facility
- toilets (harbour users only)
- sealed roads with limited access/turning circles
- unsealed road forming part of town surge wall
- limited power and water supply.



Beadon Creek Road is the primary transport route to the harbour facility. The harbour requires regular annual dredging and current depths may restrict some vessel access. Public berths currently available within the facility are limited and lessees and their contractors are not automatically guaranteed berth space. In mid 2009 the navigation markers at the harbour were upgraded to make it safer for vessels entering or leaving the facility at night.

The main use of the facility at Onslow has traditionally included recreational, fishing and charter vessel operations. In addition, some service delivery to the offshore islands and facilities (for tourism and resource capture uses) has occurred at various times from this facility. A number of boats currently use the facilities to draw fuel and water. These include boats undertaking survey work for the ANSIA and those undertaking work on offshore oil and gas projects.

There is a single-lane concrete boat ramp toward the north of the facility with a catwalk for which the Shire of Ashburton is responsible. The ramp was upgraded in 2010 through the Recreational Boating Facilities Scheme (administered by the DoT). In the longer term, further development of the harbour area may see the need to relocate the boat ramp and the Shire may soon need to consider planning for a new site.

The DoT has indicated that with the extensive growth in large scale projects taking place in the Pilbara region, other maritime support/service industries are now seeking access to the Beadon Creek facility for vessel berths and moorings as well as lease/laydown facilities. Development of various offshore oil and gas projects, together with the establishment of the ANSIA are expected to further increase the access demands on the Beadon Creek Boat Harbour.

Following the DoT receiving numerous and conflicting demands from marine service providers for land at Beadon Creek, the opportunity to lease and develop unimproved land at the facility was advertised in July 2010. The draft development concept plan for the harbour identifies a two stage development, with stage one including additional lease sites on the western side of Beadon Creek. Stage two involves possible development on the eastern side of the creek; however, concepts are yet to be developed for this. Development of stage two would require resolution of access and servicing issues.

The expression of interest process was successful with a number of the stage one lots soon to be leased. Development of these lots could potentially commence in the second half 2011. Lessees will be responsible for the provision of their own site services (or upgrade of existing services) and the timing of any development is dependent on the extent of the works required. The allocation of additional lease sites within the harbour will assist in providing much needed land for industry to support the offshore oil and gas industry in the region, while maintaining access for recreational and other vessels.

### Port and shipping facilities

Onslow Solar Salt operates a 3.5 km conveyor belt to transport salt within its lease area west of Beadon Creek and along its 1.3 km long jetty for loading on ships for export. A 10 km dredged channel is maintained to a depth of 10.8 m to facilitate access and berthing of ship. It is not anticipated that third party access to these facilities would be permitted.

The development of the ANSIA project will require the investment in port facilities with construction needing to commence in 2012. The port will be established for the commercialisation of natural gas discoveries in the Carnarvon basin, the export of LNG and other hydrocarbon related products and will cater for future industrial activities and the import/export of general cargo. The port and wharf area will be a greenfields development and will be managed and operated by the Dampier Port Authority. Loading and administration facilities will need to be completed prior to project operations commencing (anticipated 2016/2017).

### Public transport

Two local taxi services (Onslow Taxis and Nifty's) provide the only form of public transport in Onslow. These operators are licensed by the DoT.

A Greyhound bus service offers the "Onslow turn off" as a regional destination point. Passengers disembark on the North West Coastal Highway near Onslow Road and a subsidised taxi service completes the journey to Onslow. Passengers pay a nominal taxi fee with the balance being subsidised by Greyhound. This is a return service and costs are based on contract rates and fuel costs.

The commercial viability of providing the bus service route from Perth to Broome has been uncertain in recent years due to a number of factors including increased air travel opportunities. As a result, the service has been reduced to two days per week and currently operates with a State Government one-off funding injection. The future continued provision of this service is undetermined.

As well as general access and tourism, this bus service is particularly important to Onslow residents who rely on this for transport to regional health facilities and specialists. The discontinuation of this service has social implications such as reduced access to health services and to higher order centres.

There is no local bus service within the town.

## 7.6 Education

The Onslow Primary School (refer map 11) was replaced with a new state-of-the-art school facility in 2005, which caters for kindergarten to year 12 students. The school is located on the corner of Clarke Place and Simpson Street, situated on a site of significance to the Thalanyji people. The school site is relatively small at

3.2 ha, and is restricted from expansion due to the Onslow Coastal Hazard Area Special Control Area which covers part of the land. Classrooms are located on the upper level (outside of the special control area) with playing fields located on the lower level within the special control area. The school is part of the Department of Education's Remote Teaching Service.

Onslow Primary School currently has a culturally diverse student population with more than 50 per cent of the students being Indigenous. The three main Indigenous groups are the Thalanyji, Yindjibarndi and Banyjima.

Enrolments have remained relatively stable over the last five years (Table 28). A majority of the year 7 primary school students go on to lower secondary school within the town. A small number of students attending the school continue on to upper secondary.

**Table 28: Onslow school enrolment trends: 2007 to 2011 (semester one)**

Education level	2007	2008	2009	2010	2011
Pre-compulsory	12	5	19	15	16
Primary	71	77	73	86	85
Lower secondary	20	18	26	23	25
Upper secondary	9	10	10	9	2
<b>Total</b>	<b>112</b>	<b>110</b>	<b>128</b>	<b>133</b>	<b>128</b>

Source: Schools Online, Department of Education (2011)  
Note: Only includes full time students

Chevron Australia and Onslow Primary School have partnered to improve the retention and attendance of the school's secondary students. The Onslow Working on Employment, Learning and Development program aims to provide an engaging curriculum to help improve student retention and enhance their employability post-schooling. Students undertake a range of projects to learn applied skills and will complete their Certificate I in Engineering over the three year program, through a partnership with TAFE. Students will also undertake workplace learning, attend careers camps and complete safety awareness and Senior First Aid training.

Students will make an annual visit to Thevenard Island to learn about careers in both the energy and hospitality industries by visiting Chevron Australia's operations and the Mackerel Island Resort. They will also participate in the Bush Rangers volunteer cadets program to learn life skills. The David Wirrpanda Foundation and Ricky Grace's Role Models WA programs also assist with supporting the school's attendance strategy.

In 2009, the Onslow Primary School together with Leaping Lizards (a program funded through the Shire and Building Healthy Communities), the local community and the Shire Ashburton signed off on a licensing agreement to develop a community garden adjacent to the school's organic garden, which was officially opened in 2010.

### Future requirements and planning

Anticipated resource development will increase the demand for school places. The capacity of the existing school could be increased with the use of transportable classrooms; however, significant additional development in Onslow will require the construction of an additional primary school.

A strategy action of the *Onslow Townsite Strategy* includes determining the location of a future additional school site within the urban expansion area to the south of the existing built up area.

Chevron Australia's *Ashburton North Strategic Industrial Area Social Impact Statement* investigated indicative and likely industries being developed and the possible resulting population scenarios. The report indicates that the additional impact of population growth on schools would be an additional 68 students aged 5 - 12 years and 32 additional students aged 13 - 17 years (based on an additional population of 677). It is thought that primary and secondary facilities will be able to provide greater capacity for the increase in demand, provided adequate planning time and funding is made available. It is expected that upgrades will be required by 2015.

The Department of Education has investigated two demand scenarios for Onslow and the potential impact on education facilities in the town. The first scenario, based on 100 additional workers residing in Onslow by 2016, would potentially result in 36 additional students (based on 60 households using 0.35 primary students per household and 0.15 secondary students per household). These additional students could potentially be accommodated using two additional transportable classrooms located on the school site's upper level, with costs estimated at \$550,000. Two additional staff houses would also be required.

The second scenario, based on the employment forecasts presented in section 4.1 of this document (seven major projects over the period 2011 to 2022) would potentially result in 145 additional students by 2016 (285 students in total), and a further 196 students to 2022 (481 students in total). This scenario would result in the requirement for additional transportable classrooms and staff housing prior to 2016, with the school reaching capacity at this time.

Given there is little room for expansion at the current site, a new public school may need to be established, with costs estimated

at \$25 m. Another option is to develop an off-site annex, however this requires further investigation.

A 7 ha site adjacent to the new sporting and multi-purpose centre and SES building (generally bound by Third, McGrath, Hooley and Cameron Avenues) is currently reserved for the purpose of a school site (Reserve 42090). Development of future urban land; however, is likely to require development of a new school site closer to its catchment than Reserve 42090. Reserve 42090 has been earmarked by the Shire of Ashburton as a recreation and sports precinct and a draft concept plan has been developed for further consideration. Negotiation over land tenure/management arrangements of the reserve will be required. The Department of Education may require that a new school site be factored into structure plans for the urban expansion area.

Contribution towards expansion of school facilities has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project.

The *Pilbara Planning and Infrastructure Framework* also recognises that staffing schools in the Pilbara remains one of the most difficult issues facing education. Attracting and retaining high-quality educators and support staff is vital in building an outstanding education system which is sustainable. Providing high-quality housing is essential in attracting quality educators and support staff to live and work in the Pilbara. Housing demands will increase as population numbers and service demands grow under the Pilbara Cities vision.

### Tertiary education

With low student numbers in high school, it follows that tertiary education facilities in Onslow are limited. Currently, some technical training is provided using facilities of the Onslow Primary School. This includes the Working on Employment, Learning and Development program for Indigenous people run in partnership with Chevron Australia.

In 2011 the following courses are available face to face in the classroom:

- Introductory Course in Gaining Access to Training and Employment.

- Certificate I in Gaining Access to Training and Employment.
- Certificate II in Resource and Infrastructure (Work Preparation).

Pilbara TAFE offers external study options in clerical studies, management, occupational health and safety, community services, children's services, education support, information technology, art and media.

Any alternative tertiary education would involve remote learning, commuting large distances or moving from the town altogether. The nearest alternative Pilbara TAFE campuses are located 335 km away in Karratha.

Although there is no such service in Onslow, the Pilbara Australian Technical College commenced operation in 2007 in Karratha and Port Hedland offering courses to Year 11 and 12 students. Now known as Pindan College, students enter into an Australian school based apprenticeship in various trades, providing incentives for more students to stay on at school and encouraging students to pursue trade qualifications. Courses in the area of engineering, construction, automotive mechanics and commercial cookery are offered. The college has a strong focus on Indigenous training programs and is supported by the Department of Training and Workforce Development.

There are no university campuses within the Pilbara. Notre Dame University operates a campus in Broome (more than 1000 km from Onslow).

### Future requirements and planning

Consideration needs to be given to encouraging expanded access to university education in the Pilbara, particularly courses tailored to industry needs in the region. Options may include establishing or relocating a satellite campus (such as Curtin University's School of Mines based in Kalgoorlie); co-locating a campus within existing TAFE infrastructure; partnering with industry to fund a greenfield campus; and investigating new remote learning modalities and accrediting completion of industry safety programs towards formal degree qualifications. A satellite campus could play a catalytic role in fostering economic diversification

opportunities in the region by providing skills and training technology and technical expertise to support the development of new industries and economic opportunities.

According to the *Ashburton North Strategic Industrial Area Social Impact Statement*, an additional impact of population growth on the Onslow TAFE would be another 46 students aged 18 - 24 years (based on additional population of 677). It is expected that upgrades will be required by 2015. Investigation of a site for a new TAFE facility was also identified as a strategy action in the *Onslow Townsite Strategy*.

Due to the inadequacies of the existing Onslow Primary School facilities for future technical training requirements, the Department of Training and Workforce Development propose that a new training campus be established separate from the Onslow Primary School.

The requirements would be for:

- A new trade training workshop and trade training equipment for introductory trade and industrial skills training, including some apprenticeships such as metal fabrication (depending upon the requirements of local industry).
- Four classrooms, including one IT specialist classroom, one multipurpose classroom and two general purpose classrooms.
- A student services and administration centre, including toilets, reception and student information centre, staff and student meeting rooms and consultation areas, and a shared kitchen/breakout area.

The facility would require a minimum site area of 2 ha and would cost approximately \$15 m to establish (including site acquisition costs).

## 7.7 Health

The Onslow Hospital is an old northwest style veranda clad (asbestos) building located on a 4 ha site close to the town centre between Second, McGrath and Otway Avenues on Reserve 26255 (Map 11).

The hospital was opened in 1965 and while operational, it has not received any significant capital investment since commissioning, and is no longer considered fit for purpose. The Onslow Community Health Centre was also built in 1965 and was originally the nurses' quarters adjacent to the hospital. This facility is also well past its functional use and not fit for purpose.

Under the *Western Australia Clinical Services Framework 2010 - 2020*, Onslow Hospital is designated as a "small hospital" and forms part of the WA Country Health Service (WACHS) Pilbara integrated network of services. Onslow is supported by the Nickol Bay Hospital (NBH) in Karratha, as the hub for hospitals in the West Pilbara, and the Hedland Health Campus, the regional resource centre for the Pilbara region. Hospital facilities (existing and future options) provided across the Pilbara are detailed in Table 29.

There are no local resident general practitioners in Onslow. Medical cover for inpatients and emergency presentations are provided through telephone support and planned visits from District Medical Officers based at NBH.

Onslow Hospital provides a six bed inpatient service, along with a 24 hour nurse led emergency service. A review of historical activity reveals that:

- in 2009/10 approximately six to seven patients per day presented to the Onslow hospital emergency service; and
- recent inpatient occupancy rates have been approximately 18-25 per cent (that is, on average one to two of the six inpatient beds are occupied at any one time).

Beds are mainly utilised for non subspecialty medical patients and the majority of patients requiring specialised acute care are transferred to NBH or elsewhere.

Access to specialist services is through referral to NBH and Hedland Health Campus or to Perth with financial assistance provided through the Patient Assisted Transport Scheme (PATS). The Royal Flying Doctor Service (RFDS) provides transport for high priority emergency retrieval and transfer of clinically eligible patients.

The Onslow Community Health Centre (adjacent to the hospital) accommodates a community health nurse and Aboriginal health worker who provide a range of population health services for the local community. In addition, a number of ambulatory (non-inpatient) care and mental health services are provided through visiting medical specialists and allied health practitioners, many of whom are based out of Karratha.

**Table 29: Hospital facilities in the Pilbara**

Service hub	Current hub service population	Future hub resident population	Current facility options	Future facility options
South Hedland	19,000	50,000	New regional health campus (opened 2010)	Expanded Hedland health campus
Nickol Bay (Karratha)	18,700	50,000	Business case underway for new facility	Major redevelopment for new health campus proposed
Newman	6000	15,000	Business case underway for new facility	Major redevelopment proposed
Tom Price and Paraburdoo	2720	3000	Service plan completed	Major redevelopment proposed
Onslow	570	2500	Service plan completed	Major redevelopment proposed

Source: Department of Health 2011

In the absence of locally based specialist services, it is important to ensure access to visiting specialists and support from NBH and Hedland Health Campus with rapid emergency capacity and retrieval.

### Future requirements and planning

The Department of Health has recently finalised the *Western Australia Clinical Services Framework 2010 - 2020*, which will guide the delivery of public health services across the State for the next 10 years (available at [www.health.wa.gov.au](http://www.health.wa.gov.au)). This framework; however, did not account for large industry projects in Onslow and may need to be reviewed in response to updated population projections. The Department of Health is also currently preparing a State Health Infrastructure Plan, which will outline the management and development of capital assets over the next 10 years.

The forecast population growth driven by LNG plant workers and their families will place an increased demand on primary healthcare and emergency services. The high proportion of Aboriginal residents in the area and identified issues around remoteness, lack of public transport and environmental conditions further enforces the need for a population based approach focusing on the determinants of health and the causes of ill-health, as well as a concern with the promotion of health and the prevention of disease, injury and premature death rather than treatment alone.

Health workforce data and modelling has indicated there will be an imbalance between the supply and demand for clinical staff across Western Australia now and for the foreseeable future. It is widely acknowledged that as the anticipated shortages increase they will disproportionately affect the more rural and remote communities such as Onslow. However, these limitations can be mitigated, in particular, by providing appropriate access to a range of primary health care and emergency services and appropriate transport systems.

Following is a list of considerations to be taken into consideration in the planning for healthcare services in Onslow:

- Thirty three per cent of the Onslow population identify as being of Aboriginal or Torres Strait Islander descent.
- Onslow has a higher proportion of people aged 0 - 4 years and 25 - 54 years; and lower proportion of people aged 55 years and over when compared with WA.
- Based on future industry plans for Onslow it is anticipated that the number of working aged males and young families will continue to grow at a faster rate than the elderly age groups.
- There a significant seasonal influx of visitors between April and September.
- Despite the level of wealth in the community there are pockets of disadvantage whereby residents have difficulty accessing mainstream services, either due to living in remote areas, lack of transport or financial difficulties.
- There are considerable environmental health challenges in the region as a result of the extreme geographical remoteness and climatic conditions, including regular cyclones.
- Onslow is geographically isolated on the coast, 80 km from the highway and a four hour drive from Karratha.
- There are no commercial flights into or out of Onslow.

As a result, the WA Country Health Services Pilbara will be focusing on the development of the following key service delivery strategies:

- increase and enhance access to a range of primary health services;
- ensure culturally appropriate services are provided for the community with a particular focus on Aboriginal people's needs;
- developing partnerships with external stakeholders to address the social determinants of health;
- focus on ensuring workforce sustainability; and
- utilise information and communication technology and Telehealth strategies to better link service providers working across large geographical distances.



The *Pilbara Planning and Infrastructure Framework* also suggests that a new district hospital or future facility upgrades would be required for Onslow to accommodate a future town population of 2500.

In addition to facilities, other considerations to meet growing demand for health services in Onslow and across the Pilbara include greater use and investment in information technology to help provide telehealth services to overcome distance and workforce constraints, careful planning to locate health services to match settlement patterns in the Pilbara, building the capacity of Aboriginal health services by increasing the recruitment and retention of Aboriginal people as health service providers, and increasing the provision of and collaboration with the Aboriginal Medical Service, private health care providers and other non-government agencies.

Further key needs to consider include adequate supply of quality housing to attract and retain staff and provision for additional health services such as general practitioners, public health, dentists, allied health and pharmacists. Future services may also need to consider some of the recognised health issues more prevalently associated with large industrial workforces (including alcohol/substance abuse and sexually transmitted infections).

Contribution towards upgrade of health services (including dental) has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project

### Dental services

Dental services in Onslow are provided by a dentist from the Exmouth Dental Clinic who visits Onslow one week in every six weeks. Services are provided using facilities at the Onslow Hospital, and are no longer considered fit for purpose.

Based on a forecast population of 2200 by 2016, it is anticipated that a purpose built facility will be required, with capacity for expansion beyond this time. The facility could either be within the hospital or in a separate building on the hospital site.

### Aged care

In comparison to other Pilbara towns, Onslow has a relatively high ageing population, with a significant proportion being Indigenous.

There are no residential aged care beds in Onslow. Pilbara Community Aged Care Services provide a range of programs including Aged Care Assessment team (ACAT), Respite and Carelink services that provide assessment, information and resources to the ageing population.

The ACAT is based in South Hedland and provides comprehensive assessments to determine the eligibility and level of care for residents above 65 years of age and Aboriginal and Torres Strait Islander residents above 45 years of age to access Australian Government community programs and/or admission to residential aged care facility for respite or permanent care.

The Home and Community Care Centre is located at Burt Close, Onslow, and provides such services as:

- assessment, centre-based day care, client care coordination;
- counselling/support information and advocacy (care recipient);
- domestic assistance, home maintenance, meals at home; and
- personal care, respite care, social support, transport, transport – centre based day care.

There is a need to plan for improved health support services in Onslow such as culturally appropriate aged care facilities, respite care and other healthy ageing programs. In indigenous communities the need for care services begins earlier due to a range of factors; however, primarily around issues of health, substance misuse and family functionality.

Additional land at the hospital site could also be used for expanded aged care and/or other health related services or serviced could be co-located with a health precinct model.

There is an undeveloped reserve for aged persons accommodation located near the Onslow primary school that

could be also be developed in the future. Development of the site for this purpose is subject to further structure planning work currently being undertaken by LandCorp in consultation with the Shire of Ashburton.

The Shire of Ashburton has set up an Onslow Advisory Committee to assist in the development of a seniors aged care strategy. This will include looking at long term housing and accommodation needs for the aged.

## 7.8 Police, justice and emergency services

Existing facilities are shown on map 11. Onslow is serviced by a dedicated police station located near the corner of Second Avenue and First Street, closer to the Beadon Point end of town. The custodial facility was recently upgraded and there are no short term plans for expansion; however, the Western Australia Police service's long term planning supports redevelopment of the site around 2020 or thereafter. In the interim, the site permits the installation of transportable buildings should an earlier extended service delivery platform be required.

The police station is under the command of the Pilbara District Office. Special operations and task forces within this sub-district are approved through a District Tasking and Coordinating Group which can approve the use of local, district or external resources.

Reporting on the number of existing and planned operational police staff in Onslow has not been authorised for this publication.

### Justice

The court is identified as a type two category, meaning that dedicated courtrooms operate under the same roof as the local police station. A stipendiary magistrate convenes a court at least 12 times annually at this site.

There are three justices of the peace in town according to the Department of the Attorney General's website.

### Emergency services

The Onslow Multi-Purpose Centre was officially opened in January 2011. As well as catering for a number of sports and community functions it doubles as a community emergency evacuation centre and can accommodate up to 250 people for a period of five days during extreme weather conditions, such as cyclones.

The Onslow volunteer emergency services unit is located on McGrath Avenue in Onslow, adjacent to the new multi-purpose centre. The facility houses the State Emergency Services unit, Fire and Rescue Service and Bush Fire Service.

The town is also serviced by a St Johns Ambulance substation, currently located on Third Avenue and the Onslow Volunteer Marine Rescue Group Inc operates out of Beadon Creek.

### Future requirements and planning

Onslow Police Station plays an important role in the ongoing provision of policing services to the Pilbara Police District. Subject to statewide priorities and available funding, work to address the station's service performance is being undertaken.

There are no short term plans to replace the police station. The level and timing of any future investment will be influenced by evolving statewide service delivery priorities and available funding.

Should the major developments occur, ambulance and emergency services to Onslow would need to be significantly increased (including a new substation and additional ambulances) with the addition of paid career paramedics. The town would also need to consider general practitioner services, which are currently unavailable.

Increased demands on the RFDS are likely and consideration needs to be given to ensure that the Onslow airport can support the landing of appropriate medical aircraft.

Contribution towards expansion of emergency services within Onslow has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project.

## 7.9 Communications

Communications available in the Onslow township include Telstra telephone landlines, ADSL, wireless and satellite Internet access and Telstra's Next G mobile phone network. There is only one known mobile infrastructure tower located at the telephone exchange in Onslow. Telstra is the only mobile service provider for Onslow.

Wired ADSL2+ broadband services are currently known to be available to residents within Onslow from five internet providers (namely SpinTel, EscapeNet, Comcen, Primus and Telstra) from the telephone exchange, while mobile broadband services are only available from Telstra.

Other towers exist in the town for private radio communications for emergency services (Department of Environment and Conservation, Fire and Emergency Services of Western Australia and the Western Australia Police), the Shire of Ashburton, the Dampier Port Authority, utility companies and television rebroadcast.

A telecentre is located in the town and shares a site with Centrelink on the corner of Third and Simpson Avenues (map 11). The telecentre has nine computers. Six of these are for general use (fees apply), one is for free access to government websites and two are for use by senior citizens. This facility is well utilised during the tourist season and is also particularly useful for the Indigenous population managing their banking.

There is no mail delivery service in Onslow. Mail is delivered to the post office agency at 47 Second Avenue and distributed into private post office boxes.

### Future requirements and planning

Optus is planning to extend its network to provide coverage in Onslow. Under the *Telecommunications Act 1997*, carriers have access to install their equipment on the mobile phone towers belonging to other providers.

In September 2010, a \$120 m plan to deliver improved mobile telephone and emergency service coverage to regional Western Australia was announced, with the Pilbara being one of the priority areas under consideration. Project funds of \$40 m will go towards eliminating phone black spots and the remaining \$80 m is to be spent on improving communications for police and emergency services.

The Department of Commerce has carriage of State telecommunications and will implement the \$40 m component of the project, under a funding agreement with the Department of Regional Development and Lands. Funding is currently allocated for 2010/11 to 2012/13. The project objectives include:

- increasing the number of mobile telephone bases stations in regional Western Australia to provide main highway coverage and reduce coverage gaps in towns; and
- increasing the availability of high speed mobile broadband in regional areas of WA.

The Department of Commerce's business case for addressing mobile telephone coverage was based on the State's *Telecommunications Needs Assessment* (2008).

The Department of Commerce completed consultation for the project with regional stakeholders in late 2010. The Department is working with some local governments who may provide additional assistance to extend the benefits for their areas, pending the final outcome of the tender. The tender period has closed and the tenders are now being assessed. A number of approvals will need to be gained prior to the commencement of the project. Investigations under way involve production of a map showing current mobile phone coverage in the Pilbara to enable identification of service gaps in areas where it is not economic for other carriers to provide services.

A 2015 utility infrastructure priority of the *Pilbara Planning Infrastructure Framework* for telecommunications includes the augmentation of mobile phone coverage by carriers and the roll out of the National Broadband Network (NBN) in the Pilbara. Current plans for the NBN; however, show Onslow as receiving satellite coverage rather than fibre-to-the-premises or fixed wireless coverage. As a result, the maximum connection speed will be 12/1 megabits per second.

Proponents within the ANSIA will be responsible to negotiate with the NBN company to provide for their specific telecommunications requirements. This infrastructure is likely to be located within the utilities services corridor within the common road corridor.

## 7.10 Other community infrastructure

Provision of community infrastructure is essential for maintaining health and wellbeing of communities. At present, this type of infrastructure is often planned, funded and delivered in an uncoordinated manner through federal, State, local and private sector mechanisms, and is, in some cases not adequately aligned with population growth and urban expansion. There is now significant pressure to ensure that social infrastructure is delivered in line with population growth, and a need to better define the roles and responsibilities of federal, State, and local governments and the private sector in the delivery of this type of infrastructure and services. More effective outcomes may also be realised as a result of more integrated land use and infrastructure planning.

In recent times, local government has increasingly experienced an expanding role in the provision of community infrastructure, which may not necessarily be aligned with their revenue raising capacity. Limited funding, coupled with evolving community demands, increased expectations and lifestyle changes has put pressure on the State Government and local governments to both maintain existing infrastructure and develop new infrastructure.

The location of some of the community facilities in Onslow is shown on Map 11.

Chevron Australia and the State Government will contribute to a \$30 m Community Development Fund (CDF), with \$20 m to be contributed by Chevron Australia and the State contributing \$10 m of Royalties for Regions funding. Spend from the CDF is subject to approval via governance mechanisms in the SDA and allocation is yet to be determined. Other social infrastructure contributions associated with the Wheatstone project as negotiated with the Shire of Ashburton and outlined in the SDA, are also noted in the applicable infrastructure sections of this report.

### Open space and recreation

As with other Pilbara towns, the arid climate of Onslow imposes a significant constraint on use patterns and the provision of open space and recreation facilities. For a town with a relatively low population, Onslow has quite a significant range of recreational options. Recreation facilities and their utilisation are shown in Table 30.

The main outdoor recreation facility in Onslow is the Thalanyji Oval located on Reserve 30686 on the corner of Third and Cameron Avenues. It is a full sized and fully lit oval enabling evening use. The oval has Australian Rules football goalposts and a cricket pitch and adjoins an undercover children's playground, water park, toilet facilities and a barbeque area. The Onslow Sports Club (including a bowling green and two tennis courts) is located to the north of the oval.

**Table 30: Recreation facilities – Onslow**

Facility	Number	Usage (high/medium/low)
Oval (lit) (AFL and cricket)	1	medium
Tennis courts outdoor (lit)	2	high
Basketball/ netball courts outdoor (lit)	2	high
Public boat ramp	1 constructed 2 informal	high 116 registered boats (2010) Also high tourist use
Fish cleaning facilities	2	high
Bowling green	1	low
Horse racing track	1	low
Rodeo facilities	1	low
Water playground	1	high
Other playgrounds	1	high
Community garden	1	high
Onslow Multi-purpose Centre (including multi-use indoor courts for basketball, netball, tennis, badminton, indoor soccer; indoor rock climbing; and a gym)	1	high
Lookouts	3	high
Boardwalk	1	high
Sheltered picnic areas	3	high

Source: Shire of Ashburton

The water park is a new \$697,000 construction made possible by collaborative funding from the Shire of Ashburton, Royalties for Regions program and the Department of Sport and Recreation. It is a zero-depth play area where water is sprayed from colourful upright structures or ground sprays and then drained before it can accumulate. A water recycling strategy has been adopted for the park whereby water is drained into a catchment area then placed in storage tanks for treatment prior to being recycled through the park. The water park is complete with shade sails, lights, fencing and artwork.

A short distance to the south of Thalanyji Oval is the Onslow Multi-Purpose Centre. The complex is situated on Reserve 45561 on the corner of McGrath and Hooley Avenues. Construction commenced in February 2010 and the complex was officially opened in January 2011. Of the \$10.9 m total project cost, \$7 m in funding was allocated from the Pilbara Revitalisation Plan (Royalties for Regions). The new complex includes a multi-purpose indoor sports court with spectator seating, gymnasium, day care facility, kitchen and change room facilities. The centre is also to be used as an emergency evacuation centre for events such as cyclones, flooding and fires. Existing sporting facilities are also being upgraded as part of the project.

As mentioned in the education section of this report, a community garden was opened in 2010 adjacent to the school which provides a healthy community recreation focus.

A horse racing track is located approximately 12 km from the Onslow townsite which is home to the Ashburton Race Club. In addition to regular race meetings, a rodeo is usually held each year at the Onslow Rodeo Club premises which is located closer to town at Reserve 39070 (for the purpose of Go Kart Racing and Equestrian). This site is between the town landfill facility and the wastewater treatment plant. A go kart club previously operated from the site, but no longer does so. There are some moves within the community to establish a motocross club in Onslow; however, this is still in early stages of development.

### Marine and beach recreation

There is a public boat ramp (Shire of Ashburton) located at Beadon Creek and two informal boat ramps at Four Mile Creek and Sunrise Beach. In 2010 there were 116 boats registered in Onslow, which represents a doubling of registrations since 1996. Recent interest shown in development of DoT leaseholds at the Beadon Creek maritime facility indicates an increase in marine activity that may cause some conflicts in the vicinity of the public boat ramp. Future relocation of the Beadon Creek boat ramp may need to be considered.

Marine based recreation such as swimming, boating, fishing, crabbing and diving takes place at Sunrise and Sunset Beaches, Four Mile Creek, Thevenard and Direction Islands and Ashburton River. Beadon Creek jetty is also used for recreational fishing or fishing charters can be taken from this point.

Facilities associated with these recreational areas are generally low key and basic. A grassed area with some palm trees and picnic shelters are provided along the First Avenue foreshore strip (Sunrise Beach) and a similar grassed area and picnic shelter are found at Sunset Beach together with an unsealed parking area and fish cleaning facility. A fish cleaning facility and toilets are also provided at Beadon Creek. A shaded barbeque area is provided at Four Mile Creek, while camping is permitted along the Ashburton River near Three and Five Mile pools. Amenity improvements (construction of playground and picnic area) at Four Mile Creek have been proposed by the Shire of Ashburton.

A strategy action of the *Onslow Townsite Strategy* includes encouraging a potential marina development to include tourist accommodation and facilities (near the entrance to Beadon Creek). Further investigations including community support, environmental and feasibility studies would be required.

The *Ashburton North Strategic Industrial Area Social Impact Statement* (SIS) recognises that high value is placed on recreational fishing by community stakeholders and tourists and their concerns about the potential impact of large scale industrial development on fishing. The SIS states that there will be permanent exclusion zones around the ANSIA and there is likely to be permanent loss of access to Hooley Creek. In addition, recreational fishing in Onslow and the nearby islands is likely to be impacted by future operational workforces and their families.

## Lookouts, walks and trails

The ANZAC memorial and lookout at Beadon Point overlooks the Indian Ocean and includes a small grassed area and gazebo structure. The Ian Blair Memorial Boardwalk (approximately 1 km) with interpretive signage leads from the ANZAC memorial look out through natural vegetation to the Sunset Beach recreational area. Another lookout is located on Four Mile Creek road giving views to the Onslow Salt operations. An historic Onslow Heritage Trail walk is also provided within the townsite.

## Future requirements and planning

A 7 ha area of land adjacent to the multi-purpose centre and State Emergency Services building (generally bounded by Third, McGrath, Hooley and Cameron Avenues) is currently reserved for the purpose of a school site (Reserve 42090). However, this land has been earmarked by the Shire of Ashburton as a recreation and sports precinct and a draft concept plan has been developed for further consideration and land tenure/management arrangements.

A draft recreation precinct concept is in early stages of development and links the Reserve 42090 site with the Thalanyji Oval and Onslow Sports Club site. It currently depicts netball/basketball courts, tennis courts, skateboard park, a stage and amphitheatre, 25 m lap pool and additional leisure pool with associated kiosk and change room facilities, community centre, family barbeque area and various interpretive walking area and artwork. Development of squash courts and a youth centre are also proposed as part of development of the aquatic and recreation centre.

Development will be dependent on future tenure and management arrangements and shire approval of a more detailed master plan, which is likely to involve further community consultation. The *Onslow Townsite Strategy* has acknowledged the preferred location of a town swimming pool on Reserve 42090. The cost for a new aquatic centre has been estimated at approximately \$11.5 m, and the squash courts/youth centre at \$5.5 m. An upgrade of the Onslow Sports Club has also been proposed, at an estimated cost of \$3 m. Subject to funding and resolution of land tenure issues, construction of the aquatic and recreation centre could commence in late 2012. As part of a social infrastructure package negotiated with the Shire of Ashburton for the Wheatstone project, Chevron Australia will contribute funds

(estimated by the Shire at \$7 m) towards the Onslow aquatic and recreation centre.

A 475 ha area of land to the southwest of Onslow is currently the subject of an amendment to the local planning scheme to be rezoned from Strategic Industrial Area to Rural, and to delete the special control area (Onslow strategic industrial buffer) that surrounds it. This land was originally zoned to accommodate strategic industry associated with the oil, gas and salt resource development and downstream processing; however, a larger area has since been identified at the Ashburton North Strategic Industrial Area. *Amendment No. 11* was initiated in December 2010 and advertised for public comment in August 2011. Future use of this site requires further investigation and the Shire of Ashburton intends to draft a local planning policy to address the need for an overall structure plan for the site, together with preferred uses. The shire intends to request input from the Onslow Recreational Clubs Association in the preparation of the policy.

Use of the town foreshore area (including possible marina facilities) will need to consider the outcomes of the Shire's foreshore study and the coastal vulnerability study. As part of a social infrastructure package negotiated with the Shire of Ashburton for the Wheatstone project, Chevron Australia will contribute funds (estimated by the Shire at \$0.245 m) towards the Four Mile Creek picnic area and playground.

## Youth services

There is no purpose-built youth centre within Onslow. The Shire's community development team run a wide range of youth programs and these are held either in the shire hall or the new multi-purpose centre.

A full time staff member from the V Swans Active Youth Development Program (part of Swan Districts Football Club) has recently been based at Onslow. The program is sponsored by Chevron Australia and is run with close association with the Shire.

The V Swans Active program aims to build capacity through community engagement and support of Indigenous and non Indigenous people in and around the town of Onslow using sport, education and leadership programs to deliver pathways and community engagement. It will deliver a sustainable series



of community programs, set up sporting clubs and support other community organisations in Onslow in delivery of positive healthy lifestyle and youth engagement to ensure growth and opportunity for both young and older community members.

The 2010/11 State Budget includes \$44 m to be spent over the next four years to expand youth justice services program to the Kimberley and Pilbara regions, to help tackle youth offending in the early stages and provide an extended hours family support service for at risk youth and their families.

### Future requirements and planning

The *Ashburton North Strategic Industrial Area Social Impact Statement* suggests that additional population impacts will lead to 32 more children aged 13 - 17 years and 46 aged 18 - 24 years.

A coordinated partnership approach involving the Shire, resource companies, the school and police to work together to establish programs would lead to a desirable outcome.

### Childcare

There are no childcare services currently operating in Onslow. An older style building on Second Avenue previously provided occasional day care services for up to 14 places, however; this unexpectedly ceased operations mid 2011.

A new child care centre has been built within the multi-purpose centre on Hooley Avenue which was funded by the Royalties for Regions program. The new centre is licensed for long day care for up to 25 children, complete with a new undercover play area. The day care centre was expected to commence operation in May 2011, however; this did not occur. As of September 2011, the Shire of Ashburton was negotiating a private lease and child care services are expected to commence before the end of 2011.

### Future requirements and planning

There are no child care services operating in Onslow; however, opening of the new day care centre is anticipated prior to the end of 2011.

According to the *Ashburton North Strategic Industrial Area Social Impact Statement*, impact of population growth on child care

would be an additional 52 children aged 0 - 4 years indicating that additional facilities will be required prior to 2015.

Closure of the childcare facility on Second Avenue enables consideration of that site for an alternative use, which may present a welcome opportunity to the town at a time where established land parcels are in limited supply.

Contribution towards expansion of childcare facilities has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project.

### Arts, civic and cultural facilities

The Shire of Ashburton administration offices including council chambers and public library are located in the town centre area on Second Avenue, adjacent to the memorial hall. The development of resource projects and associated population growth will require the Shire to provide an increased level of service and administrative tasks, which cannot be accommodated within the existing shire offices.

The Goods Shed Museum is a historic building listed by the National Trust and is located on Second Avenue. The building was moved from Old Onslow in 1925 and contains historic artefacts and outdoor displays from the Onslow area.

The historical Old Onslow townsite is located some 18 km southwest of the existing Onslow townsite near the mouth of the Ashburton River. It comprises of about 1270 ha, accessed from Old Onslow Road via a turn off from Twitchen Road.

The area is comprised of Reserve 35118 plus sites 1 - 4 and site 6 of Heritage Council of Western Australia (HCWA) survey, being Old Onslow Sea Jetty, part of telegraph line between town and sea, section of tram track, timber bridge, and section of bridge across marshland. The area contains the earliest known structures in the town: James Clark's house; the Rob Roy Hotel; the original shed built by pastoralists; and the first licensed house. It also contains all the government buildings in the town. Some building ruins still stand.

The *Ashburton North Strategic Industrial Area Social Impact Statement* identifies that no direct impacts are expected as a result of operations within the ANSIA. However, during the construction

phase the Old Onslow townsite may experience temporary impacts from noise, dust and light. There will also be permanent change to the view from the Old Onslow cemetery due to the ANSIA development in general. It is possible that more people will visit the Old Onslow townsite due to increases in local population and additional tourists attracted by the ANSIA development.

The Old Onslow townsite is on the HCWA's Register of Heritage Places and is being considered for inclusion on the Register of the National Estate. The Shire of Ashburton adopted a conservation plan for Old Onslow in 1998 to provide guidance for the preservation and enhancement of an important historical feature in the region. The conservation plan details a series of projects that could be undertaken to secure the history of the region and ensure that visiting tourists gain a greater appreciation of the townsite. The objectives of the conservation plan have been adopted by the Shire of Ashburton as policy. An important focus of this is to manage tourist and development facilities (camping, toilets, barbecues) along the Ashburton River approach, which are to be kept a minimum distance of 500 m from the townsite. The Shire of Ashburton is proposing to review and update the conservation plan in the short term.

The Thalanyji people are the Traditional Owners in the Onslow area (determined September 2008). The Thalanyji cultural tradition is associated with the rainbow serpent Burra Balanyji that created underground tunnels linking the rivers, creeks and freshwater soaks. The inland freshwater areas and the hunting grounds around the river and creeks are considered sacred. There are a number of sites of Aboriginal cultural heritage significance in and around Onslow.

### Future requirements and planning

Costs for a new shire customer service centre, offices, meeting rooms, council chamber and local library are estimated to be around \$6 m (initial costing based on recent development in Onslow on a per m<sup>2</sup> basis).

Chevron Australia will build a new office in Onslow and will look at incorporating the Shire's aspirations for a Wheatstone project public visitors centre, customer service centre, meeting rooms and local library. As part of a social infrastructure package negotiated with the Shire of Ashburton for the Wheatstone project, Chevron Australia will contribute funds (estimated by the Shire at \$2 m) towards this.

Costs for an Old Onslow visitor centre and further conservation strategies are estimated to be \$10 m. This includes a review of the Old Onslow Conservation Plan, and conservation and development of various heritage sites. As part of a social infrastructure package negotiated with the Shire of Ashburton for the Wheatstone project, Chevron Australia will contribute funds (estimated by the Shire at \$1 m) towards conservation and tourism opportunities in Old Onslow.

It is important that Onslow's Aboriginal community be consulted to ensure respect of their valued heritage places in and around the townsite.

## 7.11 Waste management

Onslow has a landfill site (map 11) located to the south of the proposed urban extension area at Reserve 38336 (for the purpose of Gravel and Rubbish Disposal Site). The facility is licensed by the Department of Environment and Conservation as a Class II site, meaning that it can only cater for putrescible waste and low-level hazardous material.

The operation comprises of excavation and fill. Some materials are separated for recycling including metal, batteries, motor oil, tyres and green waste.

Class II landfills cannot accept controlled waste (including quarantined wastes) which must be managed by either transport to Perth for recycling, treatment or disposal; or disposal to private third party waste management service providers.

A 500 m environmental buffer exists around the site; however, the landfill facility is within 200 m of the edge of the future urban expansion area under investigation.

### Future requirements and planning

This site is in close proximity to residential areas and is nearing the end of its operational life. Additional future town growth will further exacerbate this problem. Potential landfill sites were investigated by the Shire in 2007; however, the preferred site (south of the townsite) has since become unavailable.

The Shire of Ashburton is now considering the possibility of establishing a Class IV regional facility on the North West Coastal Highway, near Peedamulla Station. Waste disposal site issues need to be resolved with some urgency.

A transfer station may be constructed on part of the existing site, or another appropriate site, to provide a convenient and more hygienic service to the community. The future location of the transfer station, while currently proposed within the existing site, could be negotiated to best respond to the proposed town expansion. The transfer station would require a 200 m buffer. The Shire of Ashburton supports establishment of a transfer station on an agreed site at the airport.

Development of waste management facilities has been negotiated as part of the infrastructure package agreed to by the State Government and Chevron Australia for the Wheatstone project.

The Pilbara local governments, through the Pilbara Regional Council, have developed a *Regional Waste Management Plan* to improve the management and use of landfills, extend the life of existing landfills and if possible replace the smaller landfills with transfer stations equipped to meet the needs of the people and the environment. One of the *Pilbara Planning and Infrastructure Framework's* utility infrastructure priorities is for waste management to include a series of townsite transfer stations and service hub recycling plants.

## 7.12 Basic raw materials

Basic raw materials is a generic term used to describe materials used in construction and land development including sand (including silica sand), clay, hard rock, limestone, (including metallurgical limestone) and gravel and other construction and road building materials. These materials are produced relatively cheaply, with the major cost being the transport to the construction site. A ready supply of basic raw materials close to towns and locations for industry in the Pilbara is, therefore, essential for future development of industry in the region, and in keeping down the costs of land development and contributing to affordable housing.

It is anticipated that the planned expansion in Karratha and Port Hedland will consume large quantities of basic raw materials

in the Pilbara Region. Development of proposed industry and residential sites in Onslow will require quantities of fill to raise development heights above flood levels; the actual amount dependent on scale, location and design. Smaller quantities of other basic raw materials will also be required, including sand for concrete making, limestone, hard rock and gravel.

To date, there has been no comprehensive regional assessment of basic raw materials undertaken, nor has the utilisation of potential substitutes been fully explored. While some site specific studies have previously been undertaken, notably for Karratha (Gozzard 1989, and Martinick 1997), information is limited and for some resource extraction areas, may be out of date. The reports undertaken so far identify a shortage of materials that are suitable for fill, with much of the limited local sand supplies constrained by environmental and/or the locations of significant heritage sites. Limited consideration has been given to the use of alternative materials that can be substituted for basic raw materials, or to alternative sources of supply. This has become a critical issue to be addressed in the Pilbara, to ensure that the necessary quantities of basic raw materials are available for construction and development to proceed. An essential requirement is a program to determine the availability of supplies and consider the cost effectiveness of using alternative sources where supplies are limited.

Each year the State Government's Royalties for Regions initiative will see the equivalent of 25 per cent of the State's annual revenue from mining and resources royalties reinvested in regional communities. The initiative will provide additional investment to help regional communities plan for their longer term sustainable development. Funds will be available for regional infrastructure, services and capacity building projects. Funds will be invested in rural and regional Western Australia based around six policy objectives, these being:

- building capacity in communities;
- retaining benefits in local communities;
- improving services to achieve equality with metropolitan communities;
- attaining sustainability;
- expanding employment and growth opportunities; and
- growing prosperity.

## 7.13 Infrastructure summary

A summary of the infrastructure needs for Onslow together with an estimate of indicative costs are shown in the following table (Table 31).

It should be noted that infrastructure provision within the ANSIA, has not been reflected in Table 31 unless otherwise stated. Some costs are unknown or preliminary only and will require further detailed investigation.

**Table 31: Infrastructure summary – Onslow**

Category / item	Current allocation / capacity	Current use	Comments	Forward investment – estimated total project cost (\$ m)
<b>Onslow Water Supply Scheme</b>	Licensed to extract 0.35 GL/yr	0.31 GL extracted 2009-2010	Sourced from Cane River borefield and treated there. Limited capacity to accommodate growth. Current upgrades include a booster pump station and upgrade of transfer main. Water Corporation currently investigating various longer term water source options including desalination plant and further expansion of Cane River borefield. Additional infrastructure upgrades include additional pipelines and booster pump station. Chevron Australia to develop a 2 ML/d desalination plant, pump station, associated power supply infrastructure and a pipeline from the plant to town as part of the infrastructure package negotiated for the Wheatstone project.	<b>yet to be determined</b>
<b>Water storage</b>	3 tanks storing 2.6 ML	All used to capacity	Two additional storage tanks required to improve water pressure (one ground storage and one elevated). Two existing tanks to be decommissioned. Chevron Australia to provide a 5 ML storage tank and a 900 kL elevated head tank and fill pump as part of the infrastructure package negotiated for the Wheatstone project.	<b>yet to be determined</b>
<b>Onslow WWTP</b>	Treatment capacity 460 kL/d Disposal capacity 290 kL/d	Current flow to the plant 180 kL/d	Some capacity to accommodate growth. Treatment capacity expected to be reached in 2013/14 and disposal capacity in 2016/17. Expansion to pond system required by 2016, and further expansion by 2022. Additional infiltration basins required by 2013, 2016 and 2022. Upgrade to existing pump station required by 2015 and construction of seven additional pump stations (two by 2016) to service proposed urban expansion. Treated wastewater reuse system also proposed. Chevron Australia to upgrade WWTP to 920 kL/d (and capable of further expansion) plus connecting infrastructure from the town to the plant as part of the infrastructure package negotiated for the Wheatstone project.	<b>yet to be determined</b>
<b>Bindi Bindi WWTP</b>	Information unavailable	Information unavailable	Serves Bindi Bindi Aboriginal community. Decommissioning will include re-route pumping station and 550 m of sewer line and site remediation.	<b>yet to be determined</b>

Table 31: Infrastructure summary – Onslow (continued)

Category / item	Current allocation / capacity	Current use	Comments	Forward investment – estimated total project cost (\$ m)
<b>Power</b>	3.6 MW (installed capacity) 5.6 MW (reliable generating capacity) 11 kVA overhead network	Operating in excess of capacity	Gas turbine plant augmented by emergency diesel generators, supplying both Onslow Salt and townsite customers.  Currently operating in excess of capacity. Reliable generating capacity reduce by up to 50 per cent in hot summer conditions. Significant upgrade required (power station and distribution network) to meet existing and future demand (up to an additional 35 MW by 2025).  New site may be required.  Horizon Power planning and funding yet to be confirmed.  Chevron Australia to develop a 9 MW power station and associated infrastructure as part of the infrastructure package negotiated for the Wheatstone project.	<b>yet to be determined</b>
<b>Onslow underground power</b>	n/a	n/a	Project funded through Royalties for Regions and Shire of Ashburton. Project will provide townsite and industrial area with underground power. Anticipated to commence in early 2012.	<b>funded</b>
<b>Roads</b>	Access via Onslow Road		Onslow Road – large sections of Onslow Road will require upgrading if resource developments proceed at the ANSIA (widening of road to accommodate increased heavy vehicle traffic). Road is nearing end of its 20-year design life. Contract awarded for design work (under way).  Chevron Australia to contribute to Onslow Road works as part of the infrastructure package negotiated for the Wheatstone project.  North West Coastal Highway (NWCH) – number of projects identified to upgrade road in response to development of ANSIA and other industry expansion in the area (increased heavy vehicle traffic).  Ring road – realignment of Onslow Road to provide an all-weather sealed link required between town centre and airport. Responsibility of Shire of Ashburton (estimated cost \$5-7 m unallocated).  Chevron Australia to contribute funds to the ring road as negotiated with the Shire of Ashburton for the social infrastructure package associated with the Wheatstone project (Shire estimate \$3 m).  Peedamulla Road – alternative access to North West Coastal Highway for reduced travel time to higher order facilities at Karratha. Responsibility of Shire of Ashburton.	<b>yet to be determined</b>    <b>290</b> (NWCH)  <b>5-7</b> (Ring road)    <b>25</b> (Peedamulla Road)
<b>Onslow airport</b>	2 runways (1600 m and 990 m)  Unsuitable for large passenger aircraft	Code 3 aircraft (Fokker 50)	Existing runways not suitable for larger passenger aircraft. Runway susceptible to flooding in extreme weather events.  Owned freehold by Shire of Ashburton. Preference for an upgrade of existing site, rather than relocation of facility.  Upgrades will be required by 2012 if resource development proceeds (min 2000 m runway).  Chevron Australia to contribute funds as negotiated with the Shire of Ashburton for the social infrastructure package associated with the Wheatstone project (Shire estimate \$30 m).  Shire of Ashburton is also actively pursuing development of enterprise centre (mixed business and light industrial development) on airport land.	<b>yet to be determined</b>

Table 30 continued on page 116

**Table 31: Infrastructure summary – Onslow** (continued)

Category / item	Current allocation / capacity	Current use	Comments	Forward investment – estimated total project cost (\$ m)
<b>Beadon Creek Maritime Facility</b>	88 m jetty cyclone moorings public boat ramp lease sites	Increased use to support offshore oil and gas industry	Facility managed by Department of Transport.  Currently utilised by fishing and charter vessels and vessels servicing oil and gas/tourism activities at nearby islands.  Opportunity to lease and develop unimproved land released in July 2010. Potential lessees will be responsible for provision of their own services to lease sites.	n/a
<b>Other port and shipping facilities</b>	Onslow Salt 1.3 km jetty and 10 km dredged channel	Private shiploading facility and berth	No third party access to Onslow Salt jetty. No plans for expansion or change.  New port facility (managed by Dampier Port Authority) is planned to service the ANSIA. Facilities to be operational prior to project operations commencing in 2016/2017.	unknown  unknown
<b>Public transport</b>	Two taxi services	Local private transport and community access role.	No bus services within the town.  Taxi services are subsidised to transport travellers to/from Greyhound bus stop on North West Coastal Highway as well as transport some residents to health services in Karratha.	unknown (bus and taxi subsidy costs and funding)
<b>Onslow Primary School (also caters for secondary students)</b>	1 (8 classrooms)	128 full time students enrolled (at Semester 1, 2011)	Multi functional school built 2005 to accommodate kindergarten to year 12 students.  School is on small site (3.2 ha) with limited room for expansion (partially affected by flood risk area). Some capacity to expand with use of transportable classrooms.  Various demand scenarios investigated – Department of Education may require an additional school site with further significant urban expansion.  Chevron Australia to contribute to expansion of school facilities as part of the infrastructure package negotiated for the Wheatstone project.	<b>2</b> (based on 36 additional students – 2 additional classrooms and staff housing)  <b>25</b> (if new school required)
<b>Tertiary schools</b>	1	unknown	Limited technical training provided using facilities at Onslow Primary School. Nearest alternative TAFE facility is in Karratha. Expanded services will be required if resource development proceeds.  A new training campus is proposed including trade training workshop, classrooms and student services and administration centre.	<b>15</b> (including site acquisition costs)



**Table 31: Infrastructure summary – Onslow** (continued)

Category / item	Current allocation / capacity	Current use	Comments	Forward investment – estimated total project cost (\$ m)
<b>Onslow Hospital</b>	1 (6 bed emergency nursing post)	6-7 patients per day (2009/10).  Average 1-2 inpatient beds occupied at any one time.	Sole health facility in the town. No local GPs resident. Inpatients and emergency medical care via telephone support and planned visits from officers based at Nickol Bay Hospital, Karratha. Onslow supported by Nickol Bay hospital ('hub' for hospitals in West Pilbara) and Port Hedland Health Campus (regional resource centre for the Pilbara).  Onslow hospital and community health centre buildings constructed in 1960s and no longer considered fit for purpose.  Hospital site partly affected by flood risk area.  Capacity would need to greatly increase if resource development proceeds.	<b>yet to be determined</b>
<b>Dental services</b>	nil (part time use of hospital facility)	unknown	No dedicated dental facilities available. Visiting dentist from Exmouth Dental Clinic currently uses facilities at Onslow Hospital one in every six weeks.  A dedicated dental facility with capacity for expansion needed by 2016 (2200 population).  Chevron Australia to contribute to health services upgrade, including dental clinic as part of the infrastructure package negotiated for the Wheatstone project.	<b>yet to be determined</b>
<b>Aged care</b>	nil	Pilbara Community Aged Care Services (PCACS) programs	There are no aged care-specific facilities within Onslow.  PCACS programs include Aged Care Assessment (based in Port Hedland), Respite and Carelink services that provide assessment, information and resources to ageing population.  Shire of Ashburton developing seniors aged care strategy (with community advisory group) to investigate long term housing and accommodation needs for the aged.  Generally, there is a need for early care services for Indigenous communities due to a range of factors.	<b>unknown</b>
<b>Police</b>	1 police station	unknown	Onslow District Police Station – facility was recently upgraded. There are no short term plans for expansion. Long term redevelopment plans around 2020 or thereafter. Transportable buildings could meet earlier extended service needs in the interim.	<b>unknown</b>
<b>Justice</b>	1 court	unknown	Courtrooms operate under the main roof of the police station. Stipendiary magistrate convenes a court at least 12 times per year.  Future requirements unknown.	<b>unknown</b>
<b>Emergency services</b>	1 (volunteer emergency services unit)  1 (ambulance sub station)		Onslow Volunteer Emergency Services building houses the State Emergency Services unit, Fire and Rescue Service and Bush Fire Service. Located adjacent to new multi-purpose centre which is also used as emergency evacuation centre.  Ambulance is based at a sub station closer to town (Third Avenue).  Additional funding and volunteers will be required if resource development proceeds.  Chevron Australia to contribute to emergency services expansion as part of the infrastructure package negotiated for the Wheatstone project.	<b>yet to be determined</b>

Table 30 continued on page 118

Table 31: Infrastructure summary – Onslow (continued)

Category / item	Current allocation / capacity	Current use	Comments	Forward investment – estimated total project cost (\$ m)
<b>Communications</b>	limited	unknown	<p>Telstra telephone landlines, ADSL, wireless and satellite internet access. Wired ADSL2+ broadband.</p> <p>Only one mobile service provider in Onslow (Telstra Next G).</p> <p>Project under way to eliminate phone black spots and improve communications for police and emergency services in the Pilbara.</p> <p>Telecentre provides community access to nine computers</p>	<b>unknown</b>
<b>Swimming pool</b>	nil		<p>Proposal to construct new 25 m pool and leisure pool adjacent to multi-purpose centre.</p> <p>Chevron Australia to contribute funds towards the pool and recreational centre as negotiated with the Shire of Ashburton for the social infrastructure package associated with the Wheatstone project (Shire estimate \$7 m).</p>	<b>11.5</b>
<b>Sporting ovals and other outdoor facilities</b>	see Table 30	see Table 30	<p>Onslow Multi-Purpose Centre and water park recently completed.</p> <p>Draft recreation precinct master plan prepared proposing netball/basketball courts, skate park, 25 m pool, community centre, barbeque area and stage/amphitheatre.</p> <p>(As previously stated under "Swimming pool") Chevron Australia to contribute funds towards the pool and recreation centre as negotiated with the Shire of Ashburton (Shire estimate \$7 m).</p> <p>Shire of Ashburton plan to upgrade the Four Mile Creek picnic area and playground.</p> <p>Chevron Australia to contribute funds for this as negotiated with the Shire of Ashburton for the social infrastructure package associated with the Wheatstone project (Shire estimate \$0.245 m).</p>	<p><b>5.5</b> (squash courts/ youth centre)</p> <p><b>3</b> (upgrade Onslow Sports Club)</p> <p><b>unknown</b> (other recreation facilities)</p> <p><b>unknown</b> (Four Mile Creek picnic and playground)</p>
<b>Boat ramp</b>	3	high	<p>One constructed at Beadon Creek harbour, two other informal ramps at Sunrise Beach and Four Mile Creek.</p> <p>Relocation of Beadon Creek boat ramp may be required with increased harbour activity.</p>	<b>unknown</b>
<b>Youth services</b>			No purpose built youth centre in Onslow. The Shire of Ashburton runs programs held in shire hall or multi-purpose centre.	<b>unknown</b>
<b>Childcare</b>	1 (25 places)	expected to commence end 2011	<p>Previous 14 places occasional day care facility closed unexpectedly mid 2011.</p> <p>New day care facility provided at multi-purpose centre (25 places), however; Shire of Ashburton currently negotiating lease to commence prior to end 2011.</p> <p>Additional services will be required if urban development proceeds.</p> <p>Chevron Australia to contribute to expansion of day care facilities as part of the infrastructure package associated with the Wheatstone project.</p>	<b>5</b> (40 places)
<b>Civic Centre (council offices, chambers, library, hall)</b>	1	high	<p>Existing facilities inadequate. New shire customer service centre, offices, meeting rooms, library and council chambers proposed to provide increased level of service.</p> <p>Chevron Australia to contribute funds as negotiated with the Shire of Ashburton for the social infrastructure package associated with the Wheatstone project (Shire estimate \$2 m).</p>	<b>6</b>

**Table 31: Infrastructure summary – Onslow** (continued)

Category / item	Current allocation / capacity	Current use	Comments	Forward investment – estimated total project cost (\$ m)
<b>Museum and heritage</b>	1	unknown	Onslow Goods Shed museum and visitors centre. Listed by National Trust. Old Onslow Townsite and ruins (18 km south west of Onslow) on the WA Register of Heritage Places and considered for Register of National Estate. Shire of Ashburton has flagged need for new visitor centre and further conservation strategies for this area.  Chevron Australia to contribute funds towards conservation and tourism opportunities at Old Onslow as negotiated with the Shire of Ashburton for the social infrastructure package associated with the Wheatstone project (Shire estimate \$1 m).	<b>10</b> (Old Onslow visitor centre, review of conservation plan and conservation of various heritage sites)
<b>Waste management</b>	Class II site	high	Site accepts putrescible waste and low level hazardous material only. Existing site located south of proposed urban expansion area. Nearing end of operational life.  Future site previously identified is no longer available.  Shire considering establishment of Class IV regional waste facility near Peedamulla Station on North West Coastal Highway.  Chevron Australia to contribute funds towards waste management facilities as part of the infrastructure package associated with the Wheatstone project.	<b>10</b>

### Infrastructure - for more information see the following links:

Department of Education: [www.det.wa.edu.au](http://www.det.wa.edu.au) see Schools Online

Department of Health: [www.health.wa.gov.au](http://www.health.wa.gov.au) see WA Public Hospital Activity

Department of Treasury and Finance: [www.dtf.wa.gov.au](http://www.dtf.wa.gov.au) see Western Australian State Budget 2011-12: [www.ourstatebudget.wa.gov.au](http://www.ourstatebudget.wa.gov.au)

Horizon Power: [www.horizonpower.com.au](http://www.horizonpower.com.au) see Pilbara Underground Power Project

Infrastructure Australia: [www.infrastructureaustralia.gov.au](http://www.infrastructureaustralia.gov.au) see Government Infrastructure Plans - Western Australia

Shire of Ashburton: [www.ashburton.wa.gov.au](http://www.ashburton.wa.gov.au)

Water Corporation: [www.watercorporation.com.au](http://www.watercorporation.com.au) see Pilbara Water and Wastewater Services - Onslow Water Supply Scheme

## 8 Royalties for Regions

Each year the State Government's Royalties for Regions initiative will see the equivalent of 25 per cent of the State's annual revenue from mining and resources royalties reinvested in regional communities. The initiative will provide additional investment to help regional communities plan for their longer term sustainable development. Funds will be available for regional infrastructure, services and capacity building projects.

Funds will be invested in rural and regional Western Australia based around six policy objectives, these being:

- building capacity in communities;
- retaining benefits in local communities;
- improving services to achieve equality with metropolitan communities;
- attaining sustainability;
- expanding employment and growth opportunities; and
- growing prosperity.

### 8.1 Delivery mechanisms

Royalties for Regions distributes benefits to regional communities through three funds as follows:

#### Country Local Government Fund

The fund aims to address infrastructure backlogs across the country local government sector and promote strategic infrastructure development and asset prevention and renewal. In 2010/11, \$101.7 m has been allocated between three components, these being:

- Country local governments – allocation to individual local governments.
- Regional groups of country local governments – allocation to fund larger scale infrastructure projects providing wider community benefits across a region.
- Department of Local Government – to support those local governments moving towards voluntary amalgamation along with support for strategic and asset management planning within the local government sector.

Local governments in the nine Regional Development Regions, as defined by the *Regional Development Commissions Act 1993* are eligible for funding.

#### Regional Community Services Fund

The fund is designed to improve the access to services in the regions. Some of the projects supported by the fund include the Patient Assisted Travel Scheme, Boarding Away From Home Allowance, Royal Flying Doctor Service, Community Resource Centres and Country Age Pension Fuel Card.

#### Regional Infrastructure and Headworks Fund

The fund supports large scale, strategic regional infrastructure and headworks projects. The fund also includes an annual allocation for the Regional Grants Scheme which offers contestable funds for private and public organisations to improve and develop infrastructure and services in the regions. Funding allocated to the Pilbara in 2009/10 under this fund is shown in Table 32.

### 8.2 Decision making criteria

#### Western Australian Regional Development Trust

The Western Australian Regional Development Trust was established in June 2010 to provide high-level, independent advice and recommendations to the Minister for Regional Development; Lands on the Royalties for Regions fund. The Regional Development Trust will provide advice on the allocations of money from the funds and on the allocation of money between the funds subsidiary accounts. The trust is required to report to parliament each year.

#### Country Local Government Fund

Funding in 2010/11 will be provided to individual country local governments and regional groups of country local governments to promote strategic infrastructure development and asset preservation and renewal. Individual local government allocations must be spent on individual local government infrastructure

asset renewal and/or infrastructure asset creation (capital works component). Allocations to regional groups of local governments' are to be spent on larger scale infrastructure projects which clearly demonstrate wider community benefits across a region (infrastructure such as roads, railways, communications, ports, energy related initiatives or any other infrastructure projects considered to provide regional benefits). Funding allocated to the Shire of Ashburton in 2010/11 under this fund is shown in Table 33.

### Regional Community Services Fund

Allocations will be provided to programs that:

- assist regional communities achieve improved access to a range of community services;
- assist regional communities overcome disadvantages caused by remoteness; and
- attract and retain essential regional government employees.

### Regional Infrastructure and Headworks Fund

Funds will be allocated to projects that:

- are acknowledged as being of strategic importance to Western Australia;
- apply broadly to a region; and
- do not fall neatly into the responsibilities of one State Government department or local government for implementation.

The Regional Grants Scheme will be administered by the nine Regional Development Commissions, including assessing applications and determining grants.

**Table 32: Pilbara – Regional Infrastructure and Headworks Fund 2009/10**

Project	2009/10 funding (\$ million excluding GST)
Exploration Incentive Scheme	\$0.14
Pilbara Revitalisation Unit	\$4.23
Regional Airport Development Scheme	\$1.38
Housing for Workers	\$63.35
Pilbara Underground Power	\$11.87
Regional Grants Scheme	\$2.30
Pilbara Water Opportunities	\$2.90
Pilbara Health Partnership	\$7.99
Ngarluma Aboriginal Sustainable Housing	\$0.50
Pilbara Revitalisation Scheme 2	\$4.96
Pilbara Health Equipment	\$2.50
Pre-Feasibility Pilbara Gascoyne	\$0.18

Source: Royalties for Regions progress report 2009/10, Department of Regional Development and Lands (2011)

**Table 33: Shire of Ashburton – Country Local Government Fund 2010/11**

Local Government	Allocation	2010-11 (\$ excluding GST)
Ashburton	Direct to local government	\$1,137,111
Ashburton	Regional groups of local government	\$612,290

Source: Country Local Government Fund Allocations 2010/11, Department of Regional Development and Lands (2010)

Royalties for regions – for more information see the following links:

Department of Regional Development and Lands:  
[www.rdl.wa.gov.au](http://www.rdl.wa.gov.au)

Royalties for Regions:  
[www.royaltiesforregions.wa.gov.au](http://www.royaltiesforregions.wa.gov.au)

## 9 Glossary

**Australian Height Datum (AHD)** is the reference for defining levels adopted by the National Mapping Council of Australia. The level of 0.0 m AHD is approximately mean sea level.

### Crown land

**Alienated land** is land held in freehold.

**Crown land** is defined as all land, not being alienated land, within the limits of the State of Western Australia that form the airspace, seabed and subsoil of marine waters and coastal waters as defined under the Australian Government's *Coastal Waters (State Powers) Act 1980*. Crown land is referred to as State land in Western Australia.

**Freehold land** is land held in fee simple, whether absolute, conditional or otherwise, of that land.

**Notice of intention to take** is a notice issued under section 170 of the *Land Administration Act 1997* and served on a landowner and any person affected by land the subject of a proposed public work. The notice provides interest holders with the opportunity to formally object to the taking of the land for the public work.

**Tenure** means the manner of possessing or holding Crown land for a specific purpose or purposes, for example: reserve tenure, road tenure.

**Unallocated Crown land** (formerly known as vacant Crown land) is Crown land that is not subject to any interest (other than Native Title interests under the *Native Title Act 1993*) and which is not reserved or declared or otherwise dedicated under the *Land Administration Act 1997* or any other Act.

### Employment

**Consequential population** – The number of persons following the application of consequential workforce multipliers and family/singles ratio.

**Consequential workers** – Workers who locate in an area because of flow-on economic opportunities generated by the commencement of resource projects (for example health, education, service industry).

**Family multiplier** – The number of additional dependents associated with a locally-based resident worker.

**Family/singles ratio** – The ratio of resident workers who bring families (dependents) to singles (those who are not arranged in families).

**FIFO** – Workers that are employed on a fly-in, fly-out basis.

**Indirect population** – The number of persons following the application of indirect workforce multipliers and family/singles ratio.

**Indirect workers** – Workers who locate in an area due to opportunities generated by the commencement of resource projects (for example equipment suppliers, fitters and turners, welders).

**Natural/organic growth** – The number of persons moving to an area due to non-project related factors (assumed to be a total increase and is therefore deemed to include singles and families). This increase may include retirees or those moving for a lifestyle change.

**Non-specific (construction) contract workers** – Workers who permanently move to an area to provide services to one or many proponents during the construction phase of projects. This component of the workforce is not directly affiliated to one proponent.

**Operational workers** – Workers associated with the operations phase of a particular project. Operational workers are either FIFO or resident in close proximity to the project.

**Project workforce** – The number of FIFO and resident workers.



## Population

**Estimated resident population (ERP)** – Available for local government areas only, this figure represents the number of people counted in an area on 30 June. It is calculated by:

- adding the people who were temporarily absent from the area on census night;
- subtracting the overseas visitors counted in the area on census night;
- augmenting the figure for estimated net undercount in the census;
- adjusting for difference between census night and 30 June; and
- updating each year using administrative data from a variety of sources.

ERPs are the official population figures for Australia. They are widely used as a basis for Government decision-making, including the allocation of seats in federal parliament and distribution of Commonwealth grants.

**Net undercount** – Immediately following the Census, the Australian Bureau of Statistics (ABS) conducts a post-enumeration survey in randomly selected households to get a picture of the net undercount. This factors-in the human error associated with collection of Census data. Factors contributing to undercount include geographic location, ethnicity, people travelling, errors with the Census form, confidentiality. People may also be counted more than once if they were away from home on Census night, but were included on the Census form at their usual residence. In the 2006 Census the estimated net undercount in WA was 3.2 per cent. This figure was 4.4 per cent for the balance of WA, and 2.7 per cent for Perth.

**Place of enumeration** – This count includes every person who spent Census night in Australia based on where they were on Census night. The figure includes residents, tourists, visitors and service populations. These data are available for towns, localities and postcode areas.

**Place of usual residence** – The number of people who state an area on the basis of where they usually live, rather than where they were on Census night. This can be a subjective measure as it depends where people consider their home to be. These data are available for towns, localities and postcode areas.

**Service populations** – People who demand goods or services from providers of such commodities. Such persons may be permanent or temporary residents of the area from which the service is sought, or they may be daytime visitors (including commuters), overnight or short-term visitors to the area or FIFO workers. Service populations are not counted separately at the Census but may represent up to 25 per cent (in the Pilbara) of the number of people enumerated in a town or locality on census night.

## Subdivision approvals

**Conditional approval** is granted by the Western Australian Planning Commission (WAPC) for subdivision to begin subject to certain conditions being met. The approval is preceded by an assessment of the proposed subdivision plan by statutory referral agencies, including servicing authorities. On receipt of conditional approval, the proponent may commence subdivision development in accordance with the conditions of approval. A conditional approval remains valid for three years where five lots or less are approved and for four years where six lots or more are approved.

**Current valid conditional approvals** refer to those conditional approvals that are still valid but have not yet been issued with final approval. In general, these are approvals for which construction/servicing has not yet commenced or is currently underway (see **active conditional approvals**).

**Active conditional approvals** refer to conditionally approved lots where a servicing agreement (agreement to construct) has been signed between the Water Corporation and the developer. These are termed lots on non-cleared agreements.

**Inactive conditional approvals** are where conditional approval has been granted and the approval is still valid, but where a servicing agreement (agreement to construct) has not been signed between the Water Corporation and the developer.

**Final approval** is the WAPC endorsement of the proponent's submitted plan/diagram(s) of survey describing the now complete subdivision; constructed in accordance with the conditions set down in the conditional approval. Final approvals are then registered with the Office of Titles where certificates of titles for the newly created lots can be issued.

## Planning

**Local planning schemes** are detailed planning schemes developed by local governments to identify the range of permitted land uses within specified locations. Within the Metropolitan Region Scheme and Peel Region Scheme areas, local planning schemes must be consistent with the provisions identified within the relevant region scheme.

**A scheme amendment** is the process of changing zones or reservations from one use to another. The amendment process requires proposed amendments to be advertised for wider community and government comment. The amendment process is regulated by the *Planning and Development Act 2005*, allowing for extensive community consultation to review the proposal before a final decision is made.

**Local planning strategy** contains the strategic plan and policy context of a local planning scheme. The strategy sets out the general aims, intentions and desired outcomes for long-term growth and change, having regard to social, economic and environmental factors. An assessment of the capacity of infrastructure such as water, sewerage, electricity and roads is also usually considered in a local planning strategy. Residential densities and commercial centres may also be identified.

**Structure plan** refers to a document including spatial plans that details the proposed layout of a future development area. The preparation of a structure plan is one of the first steps in progressing proposals for the development of new areas. In addition to illustrating details such as road configuration and the location of retail and community facilities such as shops, schools and public open space, a structure plan can also show details such as housing density, land use classifications and buffer zones. Structure plans highlight opportunities and constraints in an area, and can provide the basis for amendments to local planning schemes. Structure plans can generally be categorised as either region, district or local structure plans.

## Building approvals

A **house** is a detached building primarily used for long-term residential purposes. It consists of one dwelling unit. For instance, detached granny flats and detached dwelling units (for example, caretaker's residences) associated with a non-residential building are defined as houses. Also includes cottages, bungalows and rectories.

**Other dwellings** include all dwellings other than houses. They can be created by: the creation of new other residential buildings (for example, flats); additions/alteration work to an existing residential building; either new or alteration/addition work on a non-residential building; conversion of a non-residential building to a residential building and creating more than one dwelling unit.

**Dwelling commencements** – a dwelling unit is a self-contained suite of rooms, including cooking and bathing facilities and intended for long-term residential use. Units (whether self-contained or not) within buildings offering institutional care, such as hospitals, or temporary accommodation, such as motels, hostels and holiday apartments, are not defined as dwelling units. A building is commenced when the first physical building activity has been performed on site in the form of materials fixed in place and/or labour expended (this includes site preparation but excludes delivery of building materials, the drawing of plans and specifications and the construction of non-building infrastructures, such as roads).

## Other

**Vacant lots** refer to those lots that are undeveloped (that is have no premises constructed on the lot) and that are located on residential or special zones as designated under the various local planning schemes in Western Australia. The base information is provided by the Valuer General's Office.

## 10 References

Access Economics (2010) *Investment Monitor*, Access Economics, Canberra.

Australian Bureau of Agricultural and Resource Economics (2010) Minerals and energy – Major development projects – April 2010 listing, Australian Bureau of Agricultural and Resource Economics, Canberra.

Australian Bureau of Statistics (2008) *Catalogue 4102.0 Australian Social Trends, Article : Towns of the mineral boom*, Australian Bureau of Statistics, Canberra. Available at URL: [www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4102.02008?OpenDocument](http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4102.02008?OpenDocument)

Australian Bureau of Agricultural and Resource Economics and Sciences (2011) *Australian commodities - March quarter 2011*, Australian Bureau of Agricultural and Resource Economics, Canberra.

Australian Bureau of Agricultural and Resource Economics and Sciences (2011) *Australian mineral statistics December quarter 2010*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

Australian Bureau of Statistics 2008, *Spotlight on the Pilbara*, Australian Bureau of Statistics and Pilbara Development Commission, 16/03/2010. Available at URL: [www.regionalspotlights.com.au](http://www.regionalspotlights.com.au)

Australian Bureau of Statistics (2011), Australian Bureau of Statistics, Canberra. Available at URL: [www.abs.gov.au/](http://www.abs.gov.au/)

Chevron Australia (2010) *Draft Ashburton North Strategic Industrial Area Structure Plan*, prepared by Taylor Burrell Barnett Town Planning and Design for Chevron, Perth.

Chevron Australia (2010) *Draft Wheatstone Project Ashburton North Strategic Industrial Area Social Impact Assessment*, Chevron, Perth.

Chevron Australia (2010) *North Ashburton Strategic Industrial Area Structure Plan Report*, prepared by Serling Consulting for Chevron, Perth.

Chevron Australia (2011) *Ashburton North Strategic Industrial Area Structure Plan*, prepared by Taylor Burrell Barnett Town Planning and Design for Chevron Australia, Perth.

Department for Planning and Infrastructure (2008) *Onslow Structure Plan Review*, prepared by GHD, Government of Western Australia, Perth.

Department of Regional Development and Lands (2009) *Crown Land Administration and Registration Practice Manual*, Government of Western Australia, Perth.

Department of Fisheries (2010) *State of the fisheries and aquatic resources report 2009/10*, [Online], 31/05/2011. Available at URL: [www.fish.wa.gov.au/docs/sof/2009/state-of-the-fisheries-2009-10-full.pdf](http://www.fish.wa.gov.au/docs/sof/2009/state-of-the-fisheries-2009-10-full.pdf)

Department of Fisheries (2011) *Commercial fisheries of WA - Prawns*, [Online], 09/03/2011. Available at URL: [www.fish.wa.gov.au/docs/cf/Prawns/index.php?0206](http://www.fish.wa.gov.au/docs/cf/Prawns/index.php?0206)

Department of Housing and Pilbara Development Commission (2010) *Pilbara Towns Housing Study*, prepared by SGS Economics and Planning for the Department of Housing and Pilbara Development Commission, Perth.

Department of Mines and Petroleum (2010) *Prospect magazine*, Government of Western Australia, Perth.

Department of Mines and Petroleum (2010) *Western Australian Mineral and Petroleum Statistics Digest 2009-10*, Government of Western Australia, Perth.

Department of Regional Development and Lands (2010) *Country Local Government Fund Allocations 2010-11 - Direct to Local Government*, [Online], 28/07/2010. Available at URL: [www.royaltiesforregions.wa.gov.au/App/OpenFile.ashx?Mode=446E37686749376A356D684D2B6E6D6D4D6E555273773D3D&ContentID=37777A794E3570583055303D](http://www.royaltiesforregions.wa.gov.au/App/OpenFile.ashx?Mode=446E37686749376A356D684D2B6E6D6D4D6E555273773D3D&ContentID=37777A794E3570583055303D)

Department of Regional Development and Lands (2011) *Royalties for Regions progress report 2009-2010*, [Online], 15/03/2011. Available at URL: [www.royaltiesforregions.wa.gov.au/Content/Publications.aspx](http://www.royaltiesforregions.wa.gov.au/Content/Publications.aspx)

Department of State Development (2010) *Draft Ashburton North Strategic Industrial Area – Analysis of Infrastructure and Key Issues*, Government of Western Australia, Perth.

Department of Transport (2010) *Onslow (Beadon Creek) maritime facility Opportunity to lease*, [Online], 19/01/2011. Available at URL: [www.transport.wa.gov.au/imate/20680.asp](http://www.transport.wa.gov.au/imate/20680.asp)

Department of Transport (2010) *Onslow (Beadon Creek) maritime facility cyclone contingency plan*, [Online], 19/01/2011. Available at URL: [www.transport.wa.gov.au/imate/20680.asp](http://www.transport.wa.gov.au/imate/20680.asp)

Department of Water (2008) *Pilbara regional water plan Supporting detail*, Government of Western Australia, Perth.

Government of Western Australia (2009) *10-year blueprint for WA Health Services*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132878&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132878&search=)

Government of Western Australia (2009) *2009–10 Budget projects and secures Pilbara*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=131876&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=131876&search=)

Government of Western Australia (2009) *Building starts on 100th home for government workers in the region*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132695&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132695&search=)

Government of Western Australia (2009) *Major new gas agreement a boost for WA*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132895&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132895&search=)

Government of Western Australia (2009) *Minister gives Wheatstone project a fillip with offer to renew retention leases*, media release, [Online], 31/05/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132979](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132979)

Government of Western Australia (2009) *New partnership adds more funds for Pilbara health*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132353&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132353&search=)

Government of Western Australia (2009) *New Pilbara Regional Planning Committee meets for the first time*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132868&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132868&search=)

Government of Western Australia (2009) *Pilbara revitalisation created opportunities for traditional owners*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132743&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132743&search=)

Government of Western Australia (2009) *Planning activities abound in the Pilbara*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132495&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132495&search=)

Government of Western Australia (2010) *Private sector joins Government in delivering 'Pilbara Cities' vision*, media release, [Online], 28/01/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=133063](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=133063)

Government of Western Australia (2009) *Royalties for Regions plan to revitalise Pilbara towns*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=131812&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=131812&search=)

Government of Western Australia (2009) *Spotlight on the Pilbara*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132520](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132520)

Government of Western Australia (2009) *State Budget 2009–10: Royalties for Regions helps secure State's future* [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=131841&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=131841&search=)

Government of Western Australia (2009) *State Government launches blueprint for Pilbara Cities*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132847](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=132847)

Government of Western Australia (2009) *Transcript – Speech – Port Hedland Pilbara Cities Launch*, media release, [Online], 19/01/2010. Available at URL: [www.mediastatements.wa.gov.au/Lists/Statements/DispForm.aspx?ID=132907](http://www.mediastatements.wa.gov.au/Lists/Statements/DispForm.aspx?ID=132907)

Government of Western Australia (2010) *\$65million to secure power supply for Pilbara communities*, media release, [Online], 31/05/2011. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=133058](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=133058)

Government of Western Australia (2010) *High tech equipment arrives in the Pilbara*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Lists/Statements/DispForm.aspx?ID=133056](http://www.mediastatements.wa.gov.au/Lists/Statements/DispForm.aspx?ID=133056)

Government of Western Australia (2010) *Macedon project adds further excitement to West Pilbara*, media release, [Online], 31/05/2011. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=134049](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=134049)

Government of Western Australia (2010) *Media Response - Pilbara Cities*, media release, [Online], 4/02/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/default.aspx?ItemID=133012&search=](http://www.mediastatements.wa.gov.au/Pages/default.aspx?ItemID=133012&search=)

Government of Western Australia (2010) *Pilbara water servicing applications approved*, media release, [Online], 31/05/2011. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=134816](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=134816)

Government of Western Australia (2010) *Work starts on Onslow complex*, media release, [Online], 16/03/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=133080&search=](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=133080&search=)

Government of Western Australia (2011). *Design contract awarded for widening of North West Coastal Highway and Onslow Road*, media release, [Online], 31/05/2011. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=136259](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=136259)

Government of Western Australia (2011) *Economic and Fiscal Outlook Budget Paper No. 3*, [Online], 20/05/2011. Available at URL: [www.dtf.wa.gov.au/cms/uploadedFiles/State\\_Budget/Budget\\_2011\\_12/2011-12\\_bp3.pdf](http://www.dtf.wa.gov.au/cms/uploadedFiles/State_Budget/Budget_2011_12/2011-12_bp3.pdf)

Government of Western Australia (2011) *Government welcomes \$29 billion investment*, media release, [Online], 26/09/2011. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=144498](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=144498)

Government of Western Australia (2011) *Onslow gets cyclone shelter*, media release, [Online], 31/05/2011. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=135416](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=135416)

Government of Western Australia (2011) *More than \$250m for Onslow from Wheatstone deal*, media release, [Online], 26/09/2011. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=144499](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=144499)

Government of Western Australia (2011) *Strong business confidence to drive demand for regional industrial land*, media release, [Online], 31/05/2010. Available at URL: [www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=140077](http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=140077)

Haslam McKenzie, F., Phillips, R., Rowley, S., Brereton, D. & Birdsall-Jones, C. (2009) *Housing market dynamics in resource boom towns*, Australian Housing and Urban Research Institute, AHURI Western Australia Research Centre, Perth.

LandCorp and Department for Planning and Infrastructure (2008) *Industrial Land Needs Study*, Prepared by Syme Marmion & Co for LandCorp and Department for Planning and Infrastructure, Perth.

Macromonitor (2010) *Australian construction cost trends 2010*, Macromonitor, Sydney.

Mercer, D (2010) *Onslow faces boom*, Pilbara News, 20 January, p. 1.

National Housing Supply Council (2008) *State of Supply Report*, Government of Australia, Canberra.

Pilbara Area Consultative Committee (2008) *The Pilbara Plan: An urgent call to action to rescue Pilbara Communities*, prepared by CCS Strategic Management in association with Geografia for the Pilbara Area Consultative Committee, Karratha.

Select Senate Committee on Housing Affordability in Australia (2008) *A good house in hard to find: Housing affordability in Australia*, Select Senate Committee on Housing Affordability in Australia, Canberra.



Shire of Ashburton (2009) *Onslow recreational precinct overall Master Plan*, prepared by MCG Architects for the Shire of Ashburton, Tom Price.

Shire of Ashburton (2010) *Municipal heritage interview*, prepared by O'Brien Planning Consultants for the Shire of Ashburton, Tom Price.

Shire of Ashburton (2010) *Onslow Townsite Strategy*, Shire of Ashburton, Tom Price.

Shire of Ashburton (2010) *Onslow Townsite Strategy Background Report*, Shire of Ashburton, Tom Price.

Shire of Ashburton (2010) *Tourism Destination Development Strategy*, prepared by RBA consulting for the Shire of Ashburton, Tom Price.

Shire of Ashburton (2011) *Onslow Airport Master Plan*, prepared by Whelans Town Planning for the Shire of Ashburton, Tom Price.

Shire of Ashburton (2011) *Expression of Interest Future Development of the Onslow Airport Enterprise Centre*, Shire of Ashburton, Tom Price.

Shire of Ashburton (2011) *Onslow Social Infrastructure Investment Strategy*, Shire of Ashburton, Tom Price.

The Chamber of Minerals & Energy Western Australia (2008) *Planning for resources growth in the Pilbara: employment & population projections to 2020*, prepared by Heuris Partners Ltd for CMEWA, Perth.

The Chamber of Minerals & Energy Western Australia (2010) *Planning for resources growth in the Pilbara: revised employment & population projections to 2020*, prepared by Heuris Partners Ltd for CMEWA, Perth.

Tourism Forecasting Committee (2010) *Forecast 2010 Issue 1*, Tourism Research Australia, Canberra.

Tourism Western Australia (2009) *Tourism Accommodation Development Register Western Australia*, Government of Western Australia, Perth.

Tourism Western Australia (2010) *Register of Significant Tourist Accommodation Development*, Government of Western Australia, Perth.

Tourism Western Australia (2011) *Australia's North West Overnight Visitor Fact Sheet – Years ending December 2008/09/10*, Government of Western Australia, Perth.

Tourism Western Australia (2011) *Shire of Ashburton Overnight Visitor Fact Sheet – Years Ending December 2008/09/10*, Government of Western Australia, Perth.

Water Corporation (2010) *Onslow water supply information sheet August 2010*, [Online], 09/05/2011. Available at URL: [www.watercorporation.com.au/files/InfrastructureProjects/Onslow\\_Info\\_Sheet\\_Aug2010.pdf](http://www.watercorporation.com.au/files/InfrastructureProjects/Onslow_Info_Sheet_Aug2010.pdf)

Water Corporation (2011) *Onslow information sheet March 2011*, [Online], 09/05/2011. Available at URL: [www.watercorporation.com.au/files/InfrastructureProjects/Onslow\\_Info\\_Sheet\\_March\\_2011.pdf](http://www.watercorporation.com.au/files/InfrastructureProjects/Onslow_Info_Sheet_March_2011.pdf)

Water Corporation (2011) *Onslow water supply scheme review*, [Online], 09/05/2011. Available at URL: [www.watercorporation.com.au/O/onslow\\_water\\_supply\\_scheme\\_review.cfm](http://www.watercorporation.com.au/O/onslow_water_supply_scheme_review.cfm)

Western Australian Planning Commission (2003) *Onslow Structure Plan*, Government of Western Australia, Perth.

Western Australian Planning Commission (2009) *Pilbara Framework: Regional Profile*, Government of Western Australia, Perth.

Western Australian Planning Commission (2011) *Pilbara Planning and Infrastructure Framework*, Government of Western Australia, Perth.



## 11 Websites and resources

Access Economics

[www.accesseconomics.com.au/](http://www.accesseconomics.com.au/)

Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)

[www.abares.gov.au/](http://www.abares.gov.au/)

Australian Bureau of Statistics

[www.abs.gov.au/](http://www.abs.gov.au/)

Australian Housing and Urban Research Institute

[www.ahuri.edu.au/](http://www.ahuri.edu.au/)

Chamber of Commerce and Industry Western Australia

[www.cciwa.com/](http://www.cciwa.com/)

Chamber of Minerals and Energy Western Australia

[www.cmewa.com/](http://www.cmewa.com/)

Dampier Port Authority

[www.dpa.wa.gov.au/](http://www.dpa.wa.gov.au/)

Department of Education

[www.det.wa.gov.au/](http://www.det.wa.gov.au/)

Department of Education, Employment and Workplace Relations

[www.deewr.gov.au/](http://www.deewr.gov.au/)

Department of Fisheries

[www.fish.wa.gov.au/](http://www.fish.wa.gov.au/)

Department of Health

[www.health.wa.gov.au/home/](http://www.health.wa.gov.au/home/)

Department of Housing

[www.housing.wa.gov.au/](http://www.housing.wa.gov.au/)

Department of Local Government

[www.dlg.wa.gov.au/](http://www.dlg.wa.gov.au/)

Department of Mines and Petroleum

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

Department of Planning, Western Australian Planning Commission

[www.planning.wa.gov.au/](http://www.planning.wa.gov.au/)

Department of Regional Development and Lands

[www.rdl.wa.gov.au/](http://www.rdl.wa.gov.au/)

Department of State Development

[www.dsd.wa.gov.au/](http://www.dsd.wa.gov.au/)

Department of Treasury and Finance

[www.dtf.wa.gov.au/](http://www.dtf.wa.gov.au/)

Department of Water

[www.water.wa.gov.au/](http://www.water.wa.gov.au/)

Horizon Power

[www.horizonpower.com.au/](http://www.horizonpower.com.au/)

Infrastructure Australia

[www.infrastructureaustralia.gov.au/](http://www.infrastructureaustralia.gov.au/)

LandCorp

[www.landcorp.com.au/](http://www.landcorp.com.au/)

Main Roads Western Australia

[www.mainroads.wa.gov.au/](http://www.mainroads.wa.gov.au/)

Pilbara Cities

[www.pilbaracities.com/](http://www.pilbaracities.com/)

Pilbara Development Commission

[www.pdc.wa.gov.au/](http://www.pdc.wa.gov.au/)

Real Estate Institute of Western Australia

[www.reiwa.com.au/](http://www.reiwa.com.au/)

Royalties for Regions

[www.royaltiesforregions.wa.gov.au/](http://www.royaltiesforregions.wa.gov.au/)

Shire of Ashburton

[www.ashburton.wa.gov.au/](http://www.ashburton.wa.gov.au/)

State Government media statements

[www.mediastatements.wa.gov.au/](http://www.mediastatements.wa.gov.au/)

Tourism Western Australia

[www.tourism.wa.gov.au/](http://www.tourism.wa.gov.au/)

Water Corporation

[www.watercorporation.com.au/](http://www.watercorporation.com.au/)

## 12 Acronyms and abbreviations

ABARES	- Australian Bureau of Agricultural and Resource Economics and Sciences	ML	- megalitre
ABS	- Australian Bureau of Statistics	Mt	- million tonnes or mega tonnes ( $10^6$ tonnes)
ACAT	- Aged Care Assessment Team	Mt/a	- million tonnes or mega tonnes per annum
ANSIA	- Ashburton North Strategic Industrial Area	MW	- megawatt
CDF	- Community Development Fund	NBH	- Nickol Bay Hospital
DEC	- Department of Environment and Conservation	NBN	- National Broadband Network
DoH	- Department of Housing	NWCH	- North West Coastal Highway
DoP	- Department of Planning	OEP	- Onslow Electric Power
DoT	- Department of Transport	PATS	- Patient Assisted Transport Scheme
DSD	- Department of State Development	RFDS	- Royal Flying Doctor Service
ERP	- estimated resident population	RPT	- regular passenger transport service route
FIFO	- fly-in, fly-out	SDA	- State Development Agreement
GL	- gigalitre	SIS	- social impact statement
GROH	- Government Regional Officers' Housing	t	- tonne
ha	- hectare	TAFE	- Training and Further Education
kL	- kilolitre	Tcf	- trillion cubic feet
km	- kilometre	TJ	- terajoules ( $10^{12}$ joules)
kV	- kilovolt	TJ/d	- terajoules per day
kW	- kilowatt	WACHS	- WA Country Health Service
LNG	- liquefied natural gas	WAPC	- Western Australian Planning Commission
		WWTP	- wastewater treatment plant

## 13 Acknowledgements

The following agencies/organisations were invited to contribute to this report:

BHP Billiton Petroleum	Department of Treasury and Finance
Chamber of Minerals and Energy	Department of Water
Chevron Australia	Horizon Power
Dampier Port Authority	LandCorp
Department of Education	Main Roads Western Australia
Department of Education Services	Office of Energy
Department of Environment and Conservation	Onslow Salt
Department of Health	Pilbara Development Commission
Department of Housing	Shire of Ashburton
Department of Mines and Petroleum	Tourism WA
Department of Regional Development and Lands	Water Corporation
Department of State Development	Western Australia Police
Department of Transport	