

Wickham Townsite Structure Plan

January 2011

Prepared for
Rio Tinto



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APPENDIX B	Wickham Structure Plan Workshops Outcome Report – CCS Strategic



1 SITE OVERVIEW

1.1 SITE DESCRIPTION

The Wickham Townsite is located immediately inland from the Pilbara coast and is sited on gently undulating Spinifex plains. The developed part of town is relatively flat, with the hills to the west and north, in particular, forming a spectacular backdrop to the town.

1.2 LOCATION

Wickham is located 11 km from Roebourne and 1,573 km north of Perth. The town has access by sealed road to North West Coastal Highway to the south, and to Point Samson and Cape Lambert on the coast. It is also near the historic port of Cossack. It is 53 km from Karratha and approximately 63 km from Karratha Airport (refer **Figure 1 – District Context**).

Wickham is located in the Shire of Roebourne which covers an area of 15,197 sq km. According to the Accessibility/Remoteness Index (ARIA) developed by the National Centre for Social Applications of Geographic Information Systems, the towns within the Shire of Roebourne are all categorised as ‘Very Remote.’

1.3 EXISTING LANDUSE

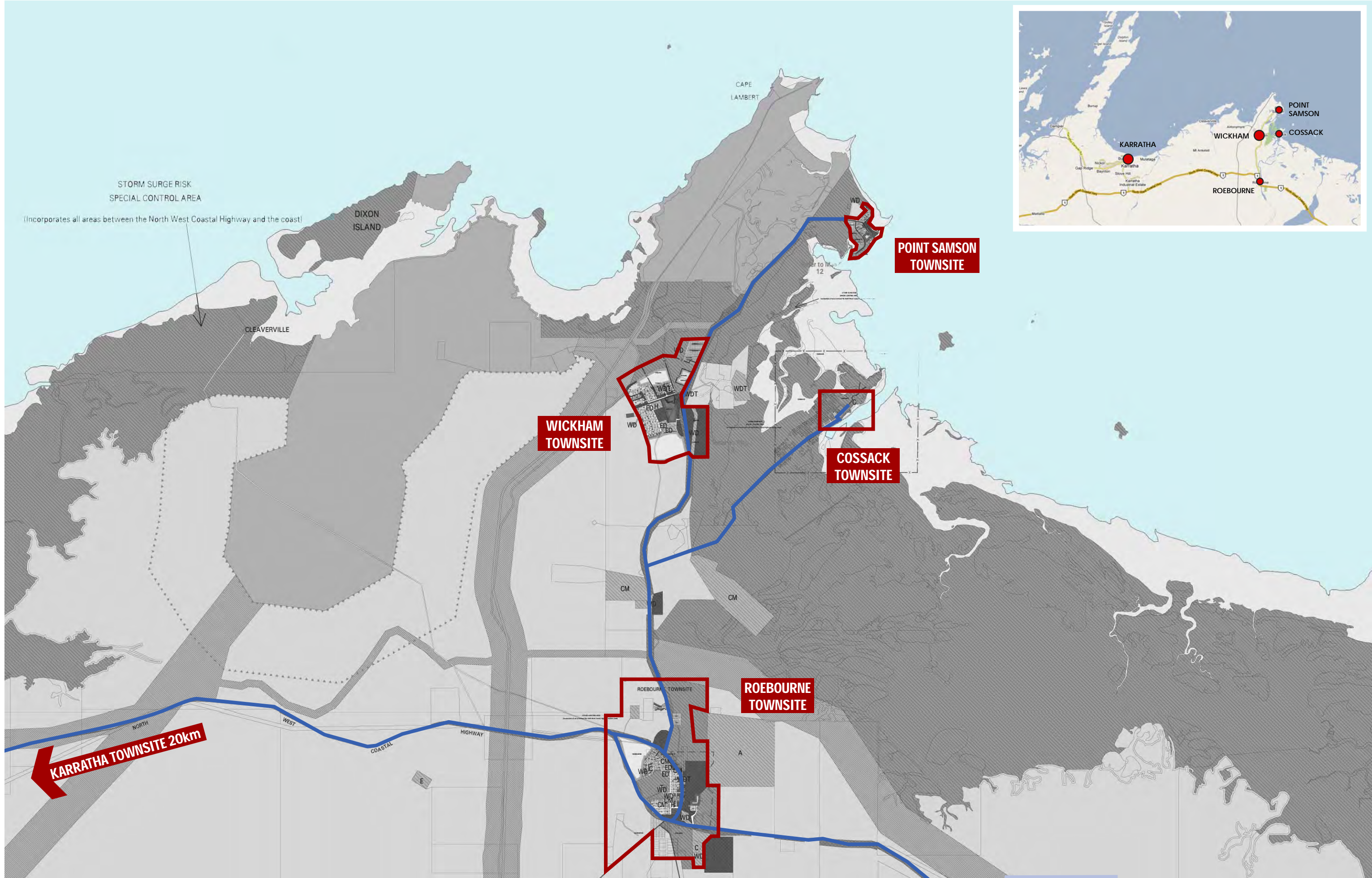
Wickham Drive is the main entry to the town from Roebourne-Point Samson Road (refer **Figure 2 – Local Context**). Another minor access from the main road is via Spinifex Drive to the south.

The town’s design and layout is characterised by an absence of interconnected streets, with all vehicular traffic directed to Wickham Drive via three north-south roads, including Frizell Road, Rivergum Road and Walcott Drive. It is these three roads which funnel vehicles to the two northern residential cells and the single southern residential cell.

The Town Centre, on either side of Mulga Way, comprises retail, commercial, civic and community uses, including a supermarket, coffee shop/café, newsagency, medical centre, police station, infant health clinic, St John’s Ambulance Post and post office. Immediately adjacent to, and supporting these Town Centre uses, is the town’s sporting and recreational precinct, a Catholic church and community hall on Carse Street (refer **Figure 3 – Land Use Plan**).

Although the Town Centre comprises a variety of land uses, it is not clearly identifiable. The land uses are scattered and buildings are set well back from the street, lacking a street presence and are uninviting.

The general ad-hoc nature of land use location and allocation within Wickham has been a consequence of an absence of a coordinated approach to land use and town centre planning. Wickham is consistent with the development of other mining towns where, at the time, expediency was given higher priority than town planning.

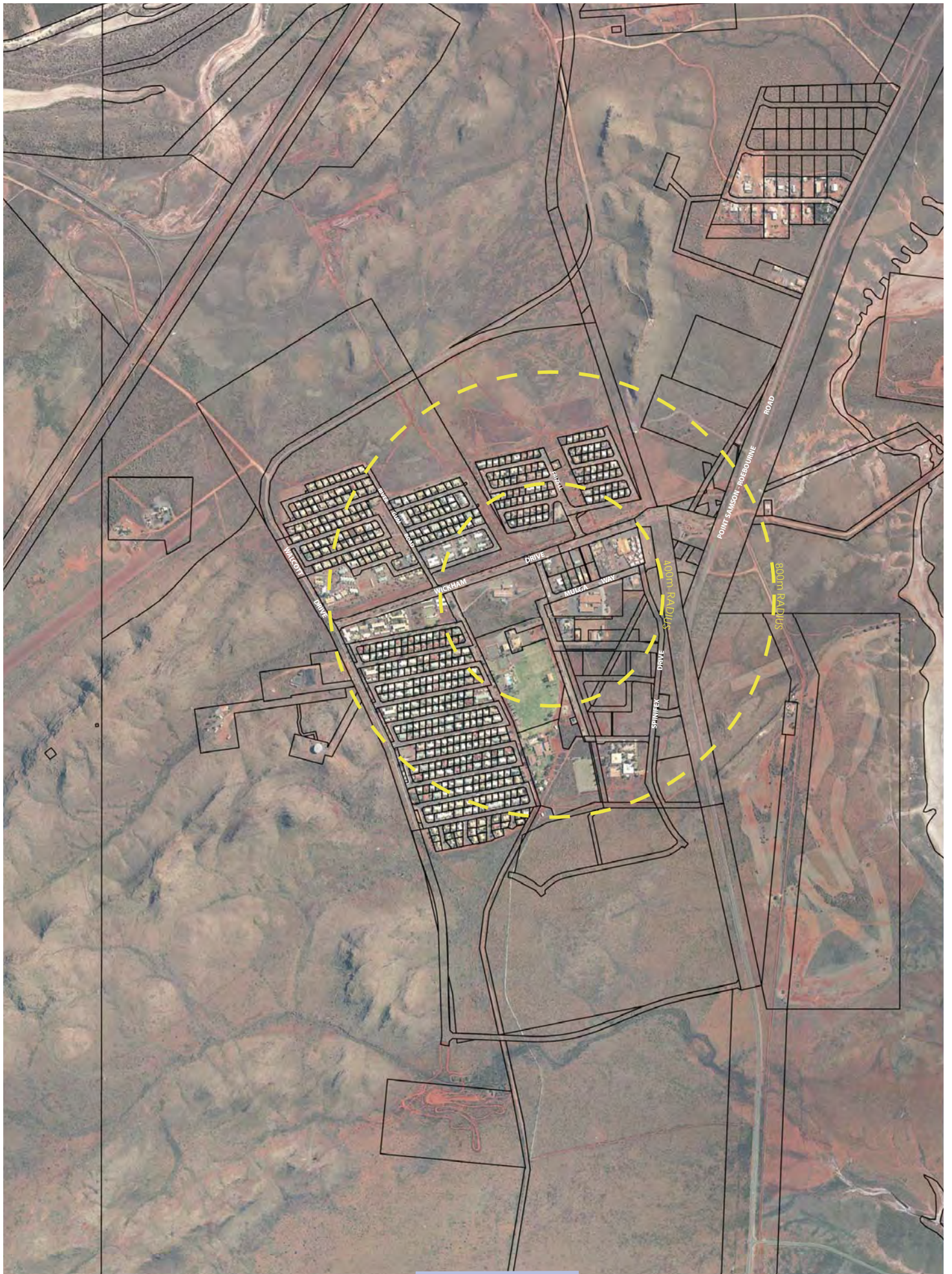


DISTRICT CONTEXT
Wickham Townsite Structure Plan

0km 2.5km
s: NTS@A3
d: Nov. 2010
j: 08/073

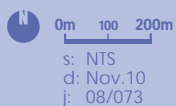


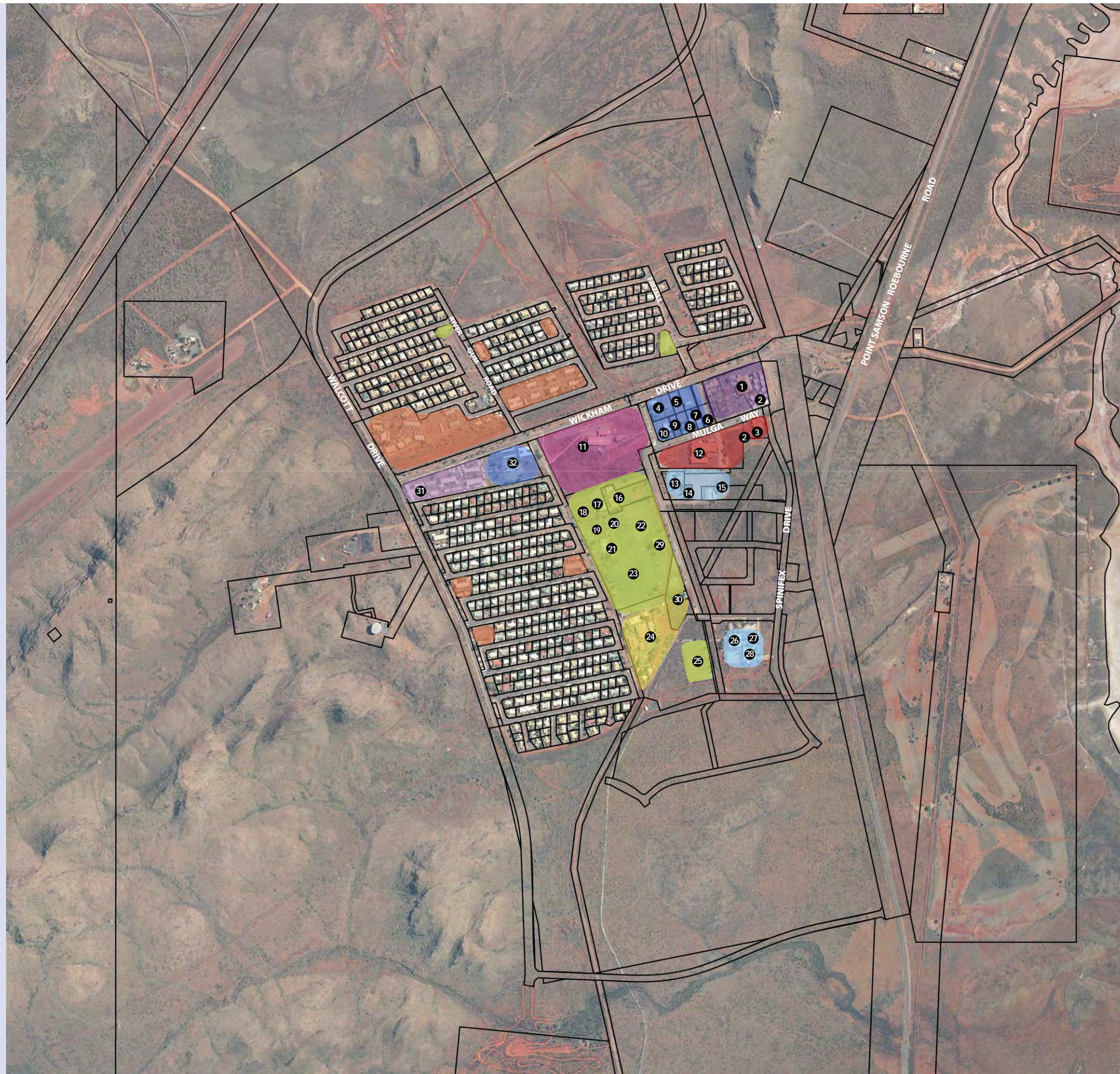
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LOCAL CONTEXT

Wickham Townsite Structure Plan





LANDUSE PRECINCTS

- RETAIL/COMMERCIAL
- CIVIC/OFFICE
- FORMAL RECREATION
- COMMUNITY/CULTURAL
- EDUCATIONAL
- MEDICAL
- SHORT STAY/COMMERCIAL
- SHORT STAY
- MEDIUM DENSITY RESIDENTIAL

LANDUSES

- 1** MESS
- 2** DONGAS
- 3** SERVICE STATION
- 4** FIRE STATION
- 5** TELECOM
- 6** POST OFFICE
- 7** ST. JOHNS AMBULANCE
- 8** INFANT HEALTH CENTRE
- 9** POLICE RESIDENCE
- 10** POLICE STATION
- 11** MEDICAL CENTRE
- 12** SHOPPING CENTRE (DVD/PIZZA SHOP, 2 RESTAURANTS, WORKSAFE, NEWSAGENT, WOOLWORTHS, LIQUOR, DELI)
- 13** CHURCH
- 14** CHILDCARE
- 15** TORRES STRAIT ISLANDER CORPORATION
- 16** OLD CLUBHOUSE
- 17** SQUASH COURTS
- 18** NETBALL
- 19** TENNIS
- 20** BASKETBALL
- 21** SWIMMING POOL
- 22** RUGBY PITCH
- 23** FOOTBALL OVAL
- 24** PRIMARY SCHOOL
- 25** OVAL
- 26** WIRRPANDA LIFESTYLE CENTRE
- 27** LIBRARY
- 28** PLAYGROUND
- 29** CLUBHOUSE (MEETING/ABSOLUTION/CHANGEROOMS)
- 30** SKATE PARK
- 31** WICKHAM LODGE (SHORT STAY ACCOM / FLY IN FLY OUT)
- 32** PILBARA IRON ADMINISTRATION OFFICES

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Other land uses in town include the primary school, owned and operated by the State's Department of Education and Training, in the southern part of town and the now disused high school building which accommodates a variety of community uses, including a library, playgroup and the Wirrapanda Lifestyle Centre.

In addition to providing permanent housing services and facilities for Rio Tinto's Cape Lambert workforce, Wickham also accommodates some of the Port's fly-in/fly-out (FIFO) operational workforce.

1.4 TENURE ARRANGEMENTS AND HISTORY

Wickham was constructed as a company town in 1972 to support operations at Robe River Iron Associates' (RRIA) Cape Lambert port facility. RRIA initially constructed all facilities and infrastructure in the town and the company provided the resources and management necessary to operate the town. Rio Tinto, which took over management and operational control of the extensive company assets of RRIA in 2000, now operates the Cape Lambert iron ore processing and shipping operation and has taken over RRIA's management role within the town.

Historically, the town was created on Crown land under Special Lease granted pursuant to the rights and obligations under the *Iron Ore (Robe River) Agreement Act, 1964*. Portions of the Special Lease area have been excised over time to enable freehold land grants, the creation of Crown Reserves and the dedication of roads (refer **Figure 4 – Land Tenure**). As depicted in **Figure 4**, the subject site falls within the Special Lease area.

The original Special Lease agreement between the Crown and the Robe River Joint Venture (RRJV) was executed 24 December 1970. This agreement specifically identified the RRJV Special Lease area for the establishment of the port town, which today is referred to as the town of Wickham.

In 1998, RRIA negotiated with the State Government for the normalisation of specified assets (including the school, hospital, roads and drains) and the transfer of these assets to the relevant State or Local Government entity. Since this time further progress on the transfer of assets and normalisation has not progressed.

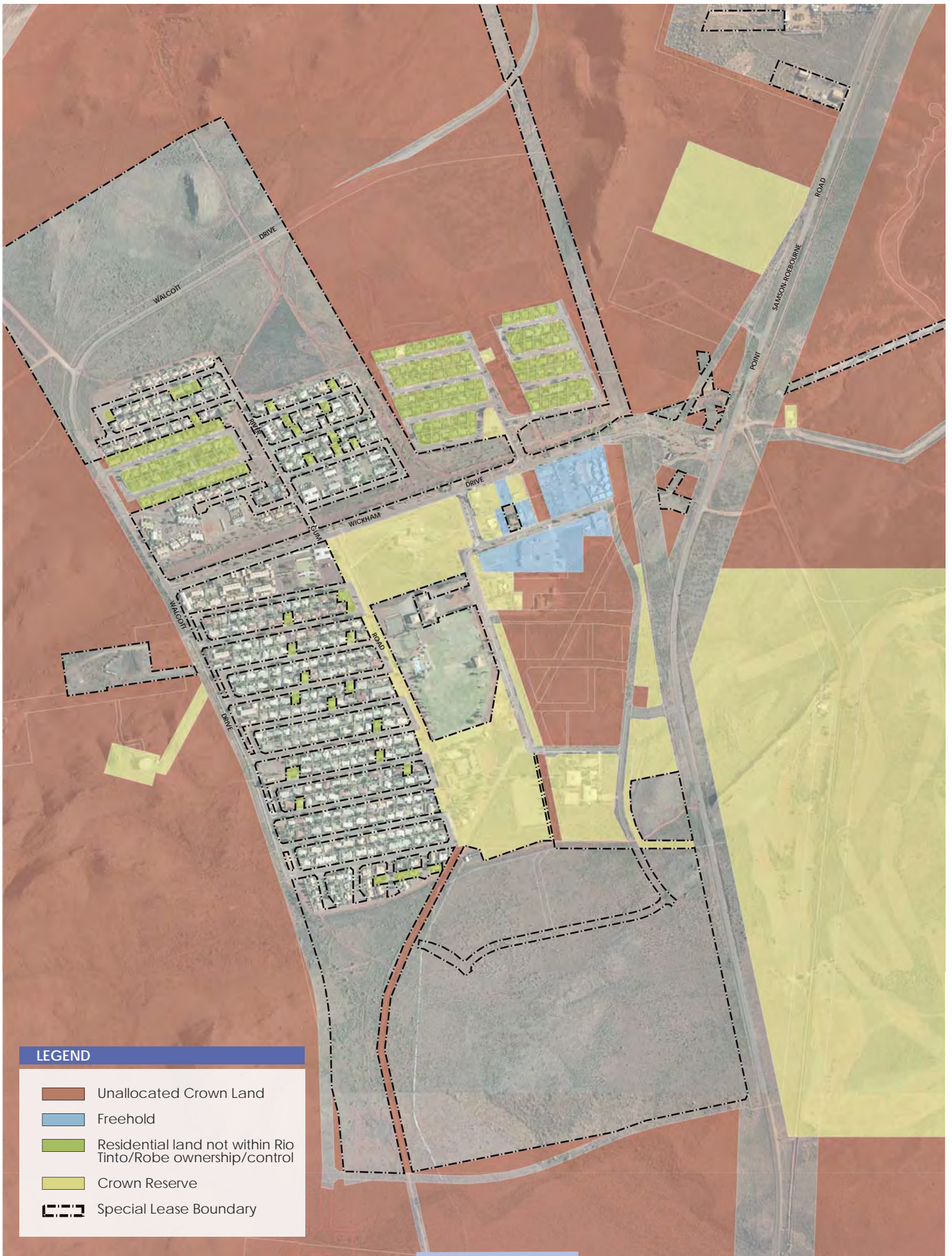
1.5 NATIVE TITLE AND INDIGENOUS HERITAGE

Wickham is located within the lands belonging to the Ngarluma and Yindjibarndi language groups. The Ngarluma and Yindjibarndi (or Injibandi) people were the first in the Pilbara to be recognised by the Federal Court as continuing to have a traditional connection to their land. This determination occurred on 2 May 2005.

"The court found that the Ngarluma/Injibandi held non-exclusive native title rights over parts of their claim area. The rights relate to access to some areas, the right to conduct rituals and ceremonies, the right to hunt, fish, forage, collect bush tucker, bush medicine, ochre, flora, fauna and water. The native title holders also have the right to protect and care for sites and objects...." (National Native Title Tribunal Press Release 2 May 2005).

Attached as **Appendix A** is an extract of the Register of Native Title Claims, a summary of the Federal Court determination and relevant maps, as they relate to Wickham. The rights and interests comprised in, and conferred under or in accordance with, the *Iron Ore (Robe River) Agreement Act, 1964* are recognised in the determination. This includes the grant of the Special Leases to the RRJV.

A review of the Aboriginal Site's Register has revealed no known sites. Heritage surveys have been scheduled to commence soon.



LEGEND

- Unallocated Crown Land
- Freehold
- Residential land not within Rio Tinto/Robe ownership/control
- Crown Reserve
- Special Lease Boundary

LAND TENURE
Wickham Townsite Structure Plan

0m 100 200m
 s: 1:12500@A4
 d: Nov. 2010
 j: 08/073

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1.6 EXISTING POPULATION AND HOUSING STOCK

According to 2006 ABS Census data, the current population of Wickham is 1,873 persons (refer **Table 1**), although information provided by Rio Tinto indicates a higher population, being 2,014 persons, assuming 575 Rio Tinto employees and a multiplier of 3.55. The 2006 Census population represents a 20% increase from the 2001 Census, although this difference may be due to the 2001 data being based on 'Place of Enumeration' and 2006 data being based on 'Place of Usual Residence'. The notable increase in population is indigenous people, which has increased by 71%, which may be a result of indigenous people moving to town to occupy State Government housing.

TABLE 1: EXISTING POPULATION IN WICKHAM - SUMMARY OF CENSUS DATA (2001 AND 2006)

Item	2001	2006	%age change
Count on Census night			
Indigenous people counted on Census	169	286	+69.2%
Non-Indigenous people counted on Census	1,562	1,587	+1.6%
Total people counted	1,731	1,873	+8.2%
Usual Residence			
Indigenous people – usual residence*	169	289	+71.0%
Non-Indigenous people – usual residence*	1,352	1,534	+13.5%
Total people at usual residence*	1,521	1,823	+19.8%
Visitors to the town	203 (11.7%)	142 (7.6%)	

* estimated from place of enumeration data ** n/a – have used numbers counted at census for 2001 data
Source: ABS 2001 and 2006 and URS 2010

According to current data (2010) provided by Rio Tinto and data provided by GROH and DoHW in 2009 and 2007, there are 731 dwellings in Wickham (see **Table 2**). This compares well with the 2006 Census data of 732.

Rio Tinto owns 76% of the dwellings in Wickham; 447 of these dwellings are occupied by Rio Tinto permanent residents, transient workers or contractors to the company. A further 15 are leased to the community and the remainder (89) are undergoing maintenance or awaiting a decision on their future.

Home ownership is minimal at 5%, although this is due to the lack of freehold land within the town, and decisions by Rio Tinto to maintain company housing under a low-cost rental arrangement.

TABLE 2: EXISTING DWELLINGS IN WICKHAM

House Category	Occupied by resident Rio Tinto employees	Owned/ being purchased	Leased/ Rented	Other	Total
Occupied by resident Rio Tinto employees	379				379
Allocated to contractors			32		32
Allocated to GROH			15		15
Allocated to Rio Tinto transient workforce				36	36

House Category	Occupied by resident Rio Tinto employees	Owned/ being purchased	Leased/ Rented	Other	Total
Under maintenance				48	48
Waiting future decisions				21	21
Available for occupancy				20	20
Total Rio Tinto owned dwellings	379	Nil	47	125	551
Privately owned, rental reimbursement by Rio Tinto	21				21
Privately owned, interest reimbursement by Rio Tinto	6				6
Privately owned houses, non Rio Tinto		6			6
Other houses and dwellings in the town (status unknown) (adapted from ABS 2006)				20	20
GROH owned houses (2007)			38		38
Department of Housing owned houses (2007)			89		89
Total non-Rio Tinto owned houses	27	6	123	20	176
Estimated total dwellings (2010)	406	6	170	145	727
Total dwellings (ABS 2006)	400	6	152	174	732

Source: ABS 2006, GROH and DoHW 2007, URS 2010

Using household composition and dwelling type data from 2006 Census data, approximately 43% of dwellings comprise three or more persons, with the remaining 57% comprising one to two persons. Information provided by Rio Tinto on dwelling type indicates 59% of all dwellings are 4 (bedrooms) x 2 (bathrooms) and 41% are 2 x 2 dwellings (refer **Table 3**).

TABLE 3: DWELLING TYPES

	4x 2 dwelling	2 x 2 dwelling
Dwelling type (%)	59	41
Household Composition (%)	57	43
Family Composition (%)	70	30
Average (%)	62	38

Source: Rio Tinto 2009

Accordingly, it is reasonable to conclude that approximately 60% of all existing dwellings in town are occupied by three or more people within a three bedroom or more dwelling, and 40% contain single persons or couples within dwellings with one or two bedrooms.

2 PLANNING CONTEXT

2.1 STATUTORY PLANNING FRAMEWORK

2.1.1 SHIRE OF ROEBOURNE TOWN PLANNING SCHEME NO. 8

Wickham falls within the Shire of Roebourne’s District Planning Scheme No. 8 (TPS 8) area refer **Figure 5 – Zoning Plan**).

Existing, developed, urban areas are zoned ‘Residential’ and ‘Town Centre’. The Wickham Light Industrial Area (LIA) is zoned ‘Industry’, with undeveloped portions zoned ‘Industrial Development’.

Land to the north and south of the existing developed areas of town are zoned ‘Urban Development’, providing an indicative footprint for an expanded Wickham Townsite, with the requirement for a Development Plan to provide the framework for the coordinated development of the land.

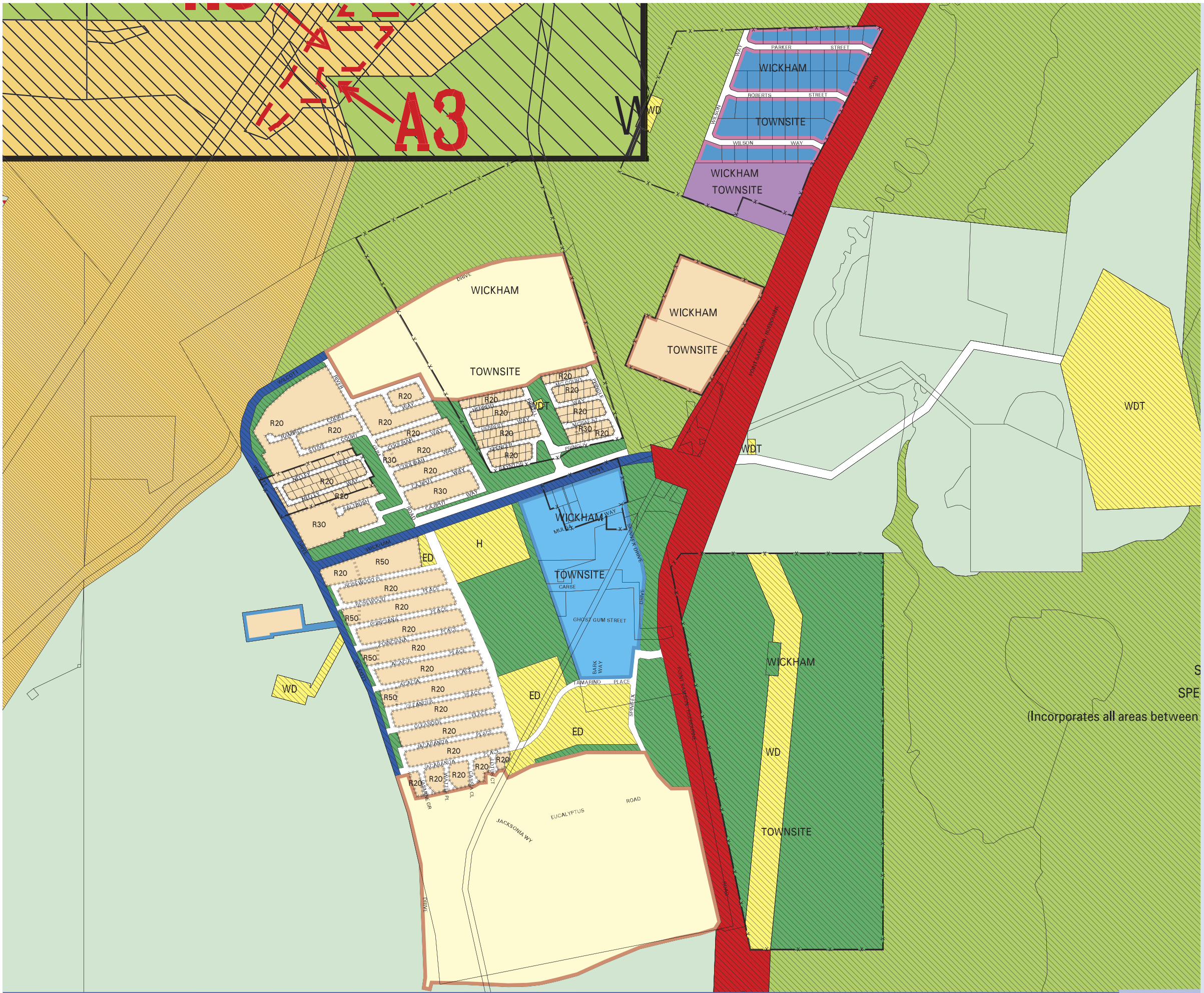
Section 6.4.1 of TPS 8 specifically states the following in relation to the preparation of a Development Plan: *“Before considering any proposal for subdivision or development of land within the Urban Development zone, the Council may require the preparation of Development Plan for the entire development area or any part or parts as is considered appropriate by Council.”* Generally, Section 6.4.2 of TPS 8 states that a Development Plan should consider (amongst other things), land use, road layout, public open space provision, servicing, lot layout and commercial and community facilities. In addition to these requirements, a Development Plan will need to have regard to the objectives of TPS 8.

Section 5.13 of TPS 8 identifies a series of objectives for Wickham. These being to:

- i) *“Increase the economic diversity and viability of the Wickham Townsite while not compromising the quality of the living environment;*
- ii) *Improve the appearance and strengthen the function of the Wickham Town Centre by creating identity, diversity and legibility;*
- iii) *Develop Improved road links between the Town Centre and Residential areas;*
- iv) *Develop the Wickham Mixed Business zone as a precinct in which:*
 - *Business may be developed in conjunction with single residences;*
 - *Uses are not permitted which are inconsistent with the residential component; and*
 - *No site may be developed purely for a residential function.”*

In providing statutory context, the shopping centre, commercial, civic and community uses within the Town Centre are encompassed within the ‘Town Centre’ zone. In addition to these existing uses, a vast amount of undeveloped Unallocated Crown Land (UCL) is also zoned ‘Town Centre’ recognising the need to set aside additional land for future retail and commercial uses in conjunction with medium density housing to meet the needs of an increased population within the expanded urban footprint of the town.

State Government assets on Crown Reserves are designated as ‘Local Reserves – Public Purpose’ under TPS 8 and areas for parks, recreation and drainage are generally designated as such under TPS 8.



LEGEND

LOCAL SCHEME RESERVES

- CONSERVATION RECREATION AND NATURAL LANDSCAPES
- DISTRICT ROADS
- INFRASTRUCTURE
- LOCAL ROADS
- PARKS, RECREATION AND DRAINAGE
- PUBLIC PURPOSES
- PUBLIC PURPOSES DENOTED AS FOLLOWS:
 - A AIRPORT
 - C CEMETERY
 - CM COMMUNITY
 - E ENERGY
 - ED EDUCATION
- PUBLIC PURPOSES DENOTED AS FOLLOWS:
 - H HEALTH
 - T TELECOMMUNICATIONS
 - WD WATER AND DRAINAGE
 - WDT WATER DISPOSAL AND TREATMENT
- STATE AND REGIONAL ROADS

ZONES

- RESIDENTIAL
- TRANSIENT WORKFORCE ACCOMODATION
- URBAN DEVELOPMENT
- COMMERCIAL
- MIXED BUSINESS
- TOURISM
- TOWN CENTRE
- INDUSTRIAL DEVELOPMENT
- INDUSTRY
- STRATEGIC INDUSTRY
- RURAL
- RURAL RESIDENTIAL

OTHER

- R CODES
- ADDITIONAL USES
- SCHEME BOUNDARY
- LOCAL GOVERNMENT BOUNDARY
- TOWNSITE - LAND ACT
- WITHNELL BAY SCA
- INDUSTRY BUFFER SCA
- AIRPORT OBSTACLE HEIGHT LIMITATION AREA SCA
- AIRPORT NOISE RESTRICTION SCA
- COSSACK HISTORIC TOWN SCA
- DAMPIER SALT SCA
- ROEBOURNE FLOOD MANAGEMENT SCA

ZONING PLAN
Wickham Townsite Structure Plan

0m 150m
s: NTS@A3
d: Nov. 2010
j: 08/073

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There are some parcels of land that are incorrectly or inappropriately zoned or reserved, including the existing Rio Tinto town services building which is reserved for 'Public Purposes – Education'. TPS 8 also does not recognise some existing road reserves and, in other areas, identifies road reserves that do not contain roads. These anomalies, while not significant, are currently being addressed as part of a separate scheme amendment process.

In regard to FIFO development, TPS 8 classifies this use as 'Transient Workforce Accommodation', with all development to be in accordance with the Shire's Transient Workforce Accommodation Policy.

2.2 EXISTING STRATEGIC PLANNING FRAMEWORK

2.2.1 PILBARA PLANNING AND INFRASTRUCTURE FRAMEWORK

The Planning and Development Act 2005 states the responsibility for regional planning lies with the Western Australian Planning Commission (WAPC). In December 2008, the WAPC established the Pilbara Regional Planning Committee with the objective of identifying key regional needs and priorities and undertaking strategic planning in consultation with regional parties and communities. The Committee is chaired by Gary Prattley, Chairman of the WAPC and has 11 other members, including Mr Greg Lilleyman from Rio Tinto, representing the Chamber of Minerals and Energy.

The Pilbara Regional Planning Committee has directed the Department of Planning (DoP), with assistance from the WAPC's Infrastructure Coordinating Committee, to prepare the Pilbara Planning and Infrastructure Framework (PPIF). The intention is the PPIF will provide the strategic planning framework for growth in the Pilbara towns in order to inform private and Government investment.

While it is understood preparation of the PPIF is significantly advanced, the document is yet to be endorsed by the Committee and released by the WAPC. When released, the document will be advertised for public comment for a period of 42 days and be modified as necessary in light of any submissions received.

From discussions with the DoP, it is understood that population growth, utility infrastructure needs, community infrastructure requirements and development issues in Wickham, as well as the other Pilbara towns, will be addressed in the PPIF. In this regard, it is expected that Wickham will be recognized as a "Major Town" in the Pilbara with a focus on its continuation as a mining port town providing local level services to an expanded Rio Tinto Cape Lambert workforce, together with a potential Anketell workforce. The relationship between Karratha and Wickham will need to be considered in any decisions concerning expansion of Wickham. Growth in Wickham may be limited due to the preference of people to live in Karratha which has access to a greater array of services and facilities. The PPIF is not expected to include a specific population target for Wickham, noting that future population of the town is highly dependent on decisions made about resources investment.

The finalised PPIF will be endorsed by the WAPC as a regional strategy under section B2 of the State Planning Framework (State Planning Policy 1) and will inform the review of the State Planning Strategy and the preparation of local planning strategies.

Any future planning for the expansion of Wickham Townsite by Rio Tinto to accommodate an increase in both permanent and non-permanent (FIFO) residents must have regard to the PPIF.

The WAPC will also have a role in endorsing Development Plans prepared for Wickham in accordance with the requirements of the Shire of Roebourne's TPS 8.

3 ENVIRONMENT

3.1 CLIMATE

Wickham essentially has two seasons, being the dry and the wet. The wet season extends from November through to April and the dry season between May and October. The annual average maximum temperature for Wickham is approximately 34° Celsius and the town receives on average 310.2 mm of rainfall annually. During the wet season it is not uncommon for Wickham to be impacted by tropical cyclones.

3.2 LAND SYSTEMS

The town and surrounds is located within 2 of the 107 Land Systems described for the Pilbara Bioregion. These Land Systems are referred to as Ruth and Uaroo. Ruth, which covers only a small portion of the subject site's north western area, is described as hills and ridges of volcanic and other rocks supporting hard spinifex (and occasionally soft spinifex) grasslands. Uaroo which covers the majority of the subject site is described as broad sandy plains supporting shrubby hard and soft spinifex grasslands.

3.3 GEOLOGY AND SOILS

Geologically Wickham is dominated by poorly consolidated Quaternary colluvium and alluvium associated with the Uaroo land system. Low rocky hills of volcanic and metamorphosed sedimentary rock rise up from the surrounding plain in the central and western parts of the subject site and are associated with the Ruth land system.

Deep red sands and red loamy earths cover the majority of the land with shallower red silt loam soils occurring in pockets on rocky hills.

3.4 HYDROLOGY

3.4.1 SURFACE HYDROLOGY


The most prominent drainage features across the land consist of narrow, minor flow-lines associated with the low rocky hills which rise from the surrounding sandy plain. These flow-lines drain in a predominately easterly direction before emptying onto a broad sandy plain. A single minor flow-line traverses the sandy plain in the south but overall, drainage across the sand plains occurs via sheet flow.

3.4.2 GROUNDWATER HYDROLOGY

Groundwater along the Pilbara coast is associated with alluvial aquifers along major rivers. In the Cape Lambert area, approximately 8km to the north east, groundwater is typically associated with Quaternary alluvial sediments and fractured Precambrian bedrock and is located between 2m and 8m below the land surface.

3.5 ACID SULPHATE SOILS AND CONTAMINATED SITES

According to the Department of Environment and Conservation's acid sulphate soils mapping, there is 'no known risk' of acid sulphate soils occurring within the Wickham Townsite and surrounds.



Rio Tinto has advised according to their Geographic Information System, there are no known or suspected contaminated sites.

3.6 FLORA

Rio Tinto has undertaken flora and vegetation studies on uncleared areas of potential development to ascertain existing characteristics and to determine the appropriateness of clearing for the purposes of facilitating development.

A botanical survey was conducted over the study area by Rio Tinto botanist Sam Luccitti from the 28 to 30 September 2010. The aim of the survey along with desktop studies was to describe the local environment including flora, vegetation, geology, landforms, soils and hydrology in order to support an application for a Native Vegetation Clearing Permit under Part V and/or an Environmental Impact Assessment under Part IV of the *Environmental Protection Act 1986*. The proposal was assessed against the 10 Clearing Principles as defined in Schedule 5 (Principles for Clearing Native Vegetation) of the *Environmental Protection Act 1986*.

Eleven vegetation units were identified across the study area. None of the 11 vegetation units are listed under the *EPBC Act 1999* nor are any defined as TECs or PECs by the DEC. Vegetation units associated with sandy plains and aeolian sand dunes were, however, identified as having moderate conservation significance on the basis that such habitats are locally uncommon in the Wickham and Cape Lambert localities.




No Declared Rare Flora species or flora species listed under the *EPBC Act 1999* were recorded from the study area, and none would be expected to occur. No Priority flora or flora of conservation significance were recorded in the study area.

Consideration of the proposal with regard to the “10 Clearing Principles” as defined in Schedule 5 of the *Environmental Protection Act 1986* found that the proposal is unlikely to be at variance with any of the clearing principles.

A full copy of Rio Tinto’s flora and vegetation survey report can be provided on request.

3.7 FAUNA

A Level 1 fauna assessment has been undertaken by Biota on behalf of Rio Tinto. Biota’s studies consisted of the following:

-  A level 1 assessment based on information derived from the Federal DSEWPC Protected Matters database, State NatureMap database and Biota internal database. Additional information was compiled from publications relating to previous survey work completed in adjacent areas. This included a specific focus on threatened fauna potentially occurring in the study area, and the identification of key fauna habitats (with reference to existing vegetation survey data).
-  A targeted survey for Short-range Endemic (SRE) invertebrate fauna within the study area and similar surrounding habitats.
-  Habitat assessment of proposed impact areas and surrounds.

Biota advises the majority of the fauna habitats within the subject site are degraded and are not considered to be significant from a conservation perspective. Less degraded fauna habitats within the site are widespread and well represented elsewhere in the region. Additionally, the small scale and localised nature of the proposed development make it very unlikely that the conservation status of any fauna species potentially occurring within the subject site will be affected.

Similarly, potential impact on invertebrate taxa is considered negligible. In addition, potential SRE species that were recorded within the proposed development area during the survey were also recorded outside the impact area.

A full copy of Biota's fauna assessment report can be provided on request.

3.8 AIR QUALITY

Rio Tinto recently engaged SKM to undertake an Air Quality Impact Assessment based upon the future expansion of the Cape Lambert facilities (Port B). The study determined the predicted air quality impact and dust deposition rates and was prepared in accordance with the Department of Environment and Conservation's Air Quality and Air Pollution Modelling Guidance Notes (2006). The study has specifically determined air quality impact on Point Samson, given it is the closest residential population to the Cape Lambert facilities.

The findings concluded that the current air quality and dust deposition levels (at 230 Mtpa) are within the acceptable criteria limits for residential areas. Furthermore, whilst the expansion will increase these levels, no exceedance of the assessment criteria will occur solely as a result of the combined Port A and Port B operations. This is primarily attributable to the high moisture level of many of the ore products to be delivered into the Port B development and a range of significant dust mitigations practices to be implemented during operations.

As the residential population of Wickham is located further from Cape Lambert than Point Samson and not in line with the prevailing sea-breezes, air quality is not considered to be a constraint to this project.

3.9 NOISE

An environmental noise impact assessment was recently undertaken by SVT Engineering Consultants on behalf of Rio Tinto on the Cape Lambert rail marshalling yard. The objective of the assessment being to assess the potential noise impacts from construction and operation at Cape Lambert based on a production rate of 280 Mtpa. The assessment applied the noise criteria outlined in the WAPC's State Planning Policy 5.4: Road and Rail Transport Noise and Freight Considerations in Land Use Planning. This policy stipulates a night time noise target of no more than 50 dB.

The findings concluded that no exceeding of the assessment criteria was predicted for any of the four noise receptors located within the Wickham Townsite.

Rio Tinto has also recently engaged SVT to undertake noise modelling for further expansion scenarios for the Cape Lambert operations up to 440 Mtpa. SVT will also recommend any mitigation measures that may be required at this higher production rate.

3.10 TRAFFIC AND TRANSPORT CONTEXT

The town of Wickham is located approximately 10 km north of North West Coastal Highway and west of Roebourne – Point Samson Road which provides the main point of access to the town. The town is specifically accessed via its main connection from Wickham Drive to Roebourne – Point Samson Road and via a minor connection to Hakea Road.



Roebourne – Point Samson Road provides the regional link to the North West Coastal Highway both in west and east directions. Roebourne – Point Samson Road also provides a district link to Roebourne to the south and Point Samson to the north. Both roads are constructed to a sealed standard.

4 ISSUES AND OPPORTUNITIES

4.1 ANALYSIS OF TOWNSITE ISSUES AND OPPORTUNITIES

Figure 6 - Issues and Opportunities - Wickham Townsite illustrates the broad-level movement network, open space and land use considerations that will inform and influence the planning for expansion of the town and consolidation/redevelopment opportunities.

4.1.1 MOVEMENT NETWORK

DISCONNECTED NEIGHBOURHOOD CELLS

The existing Townsite movement network has limited connectivity, lacking both north-south and east-west permeability. In some cases, the current street pattern does not permit direct access between adjacent street blocks. This consequently leads to a disconnection of some of the town's residents from the Town Centre core and key community uses, such as the recreation facilities and playing fields.

INTERFACE AND ACCESS TO WICKHAM DRIVE

Wickham Drive functions as the key west-east local distributor road within the town. However, the abutting drain and limited connectivity to Wickham Drive creates a physical divide between north and south Wickham. In the context of its role in the overall movement network, and within the Wickham Town Centre, existing development along Wickham Drive does not adequately address the street, nor does it adequately connect with the local movement network.

IMPROVE VEHICULAR CONNECTIVITY

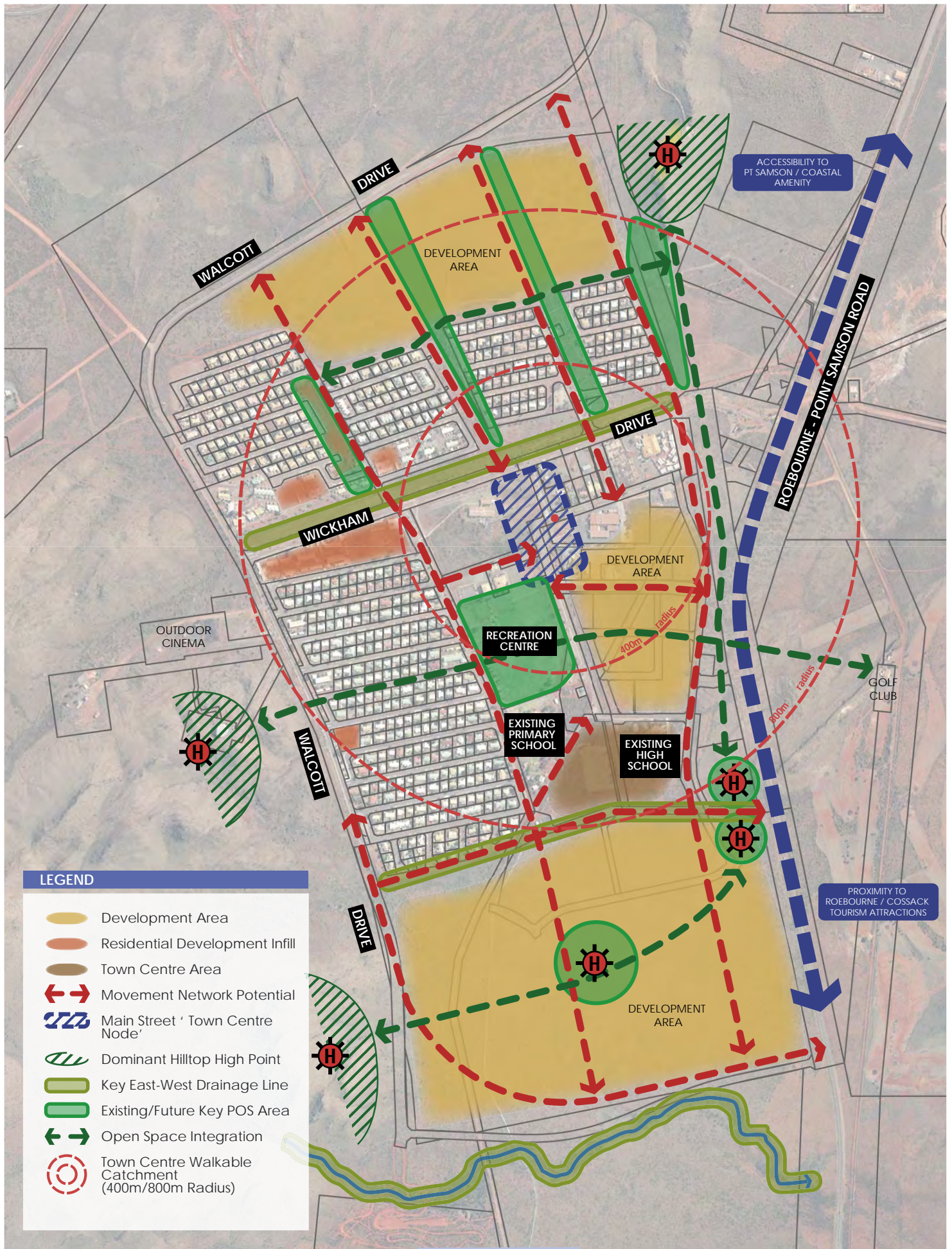
Whilst the existing movement network is characterised by a lack of permeability and connectivity, the provision of a number of key additional road connections has the ability to greatly improve upon the existing network. Consideration should be given to these additional connections as part of any redevelopment or improvements within the town. **Figure 6** provides an indication of the opportunities for improvements to the Townsite urban structure that would facilitate better integration between residential neighbourhoods, between key facilities, and to the regional movement system.

SINGLE CONNECTION TO HIGHWAY

With Wickham Drive as the only connection to Roebourne-Point Samson Road, the town's residents are lacking a suitable level of connectivity to the regional distributor that provides access to the coast, the Yacht Club and other local attractions.

4.1.2 PUBLIC OPEN SPACE NETWORK

The open space character of Wickham is largely defined by the central recreation node, the informally 'landscaped' linear drainage/open space reserve, and the high points of the surrounding ranges and the outcrops around the edges of the town.



LEGEND

- Development Area
- Residential Development Infill
- Town Centre Area
- Movement Network Potential
- Main Street 'Town Centre Node'
- Dominant Hilltop High Point
- Key East-West Drainage Line
- Existing/Future Key POS Area
- Open Space Integration
- Town Centre Walkable Catchment (400m/800m Radius)

ISSUES AND OPPORTUNITIES PLAN - WICKHAM TOWNSITE
Wickham Townsite Structure Plan

0m 100 200m
s: 1:12500@A4
d: Nov. 2010
j: 08/073



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LINEAR OPEN SPACE AND DRAINAGE REQUIREMENTS

Adding to the disconnected nature of the existing movement network are the significant lengths of linear open space/drainage areas throughout the town. These portions of open space are generally swale systems that have been designed to accommodate major stormwater events. Predominantly north-south in alignment, these swale systems restrict east-west movements between neighbourhood cells. Being an asset of the Shire of Roebourne, these large open space areas are also a substantial ongoing maintenance cost to the Shire. The rationalisation of these open spaces may yield management and community benefits. The design of new drainage areas needs to avoid the issues created by the existing reserves where possible.

STRONG LANDFORM ELEMENTS

There are two existing ridgelines to the north-east and south-west of the existing Townsite. These two hills are important landmarks providing vertical relief in what is a particularly flat landscape. As such consideration should be given to the creation of view corridors to these peaks.

RECREATION CENTRE

The existing playing fields and facilities in the recreation centre are a key community asset. The upgrading of the recreation centre area also provides an opportunity to strengthen the relationship of this community focal area with the Town Centre and residential neighbourhoods.

INTEGRATION OF OPEN SPACE AREAS

In addition to the improvement of the quality of the open space experience in Wickham, the future development in, and rejuvenation of, the town should take the opportunity to integrate the various types of open spaces into a coherent, useful and enjoyable public realm experience. **Figure 6** indicates that the existing open space structure can be enhanced and extended to capture the inherent qualities of the existing and surrounding fabric.

4.1.3 LAND USE

The land use pattern in Wickham is influenced by the Highway to the east and the hills to the west and north. The recreation area is central to the town and the Town Centre is at the eastern edge of the Townsite. The location of the schools at the existing southern extent of the town and the arrangement of existing residential areas conspires to ensure that any new development areas will be dislocated from key facilities of some type, and the provision of a new school will need to occur in a compromised location.

ABILITY FOR EXPANSION

The existing growth pattern of the Wickham Townsite lends itself to expansion both to the north and south of the existing development fronts. An extension of this growth pattern is only further supported by the substantial portion of Special Lease land available to the south (the Development Plan area) and a sizeable portion of developable Special Lease land to the north. The current 'Urban Development' zoning to the north and south of the existing Townsite also facilitates the extension of this growth pattern.



CONSOLIDATION

Residential density throughout the Townsite generally provides for R20 housing with little variation provided for discontinuous medium density housing. The housing product of the Townsite generally consists of single detached dwellings on lots of approximately 700m². The opportunity exists to establish a dual density coding (e.g. R20/R40) for those areas currently zoned R20 to facilitate the redevelopment of existing larger lots with 2 or 3 dwelling grouped housing sites. Provisions to facilitate development to the greater density of the split coding could provide incentives to create housing of a higher standard or finish, or removal of existing 'run-down' housing stock.

The application of a split density coding to facilitate medium density housing would provide for renewal of existing housing; streetscape upgrade; greater housing diversity; and better use of scarce land resources.

TOWN CENTRE INTEGRATION

The connectivity between the Town Centre and the existing and future residential areas is a fundamental issue to be resolved as part of any future development in Wickham. A Town Centre that is more part of the town will have positive benefits for place-making initiatives, economic sustainability for businesses, and community integration.

SHOPPING PRECINCT

The existing Wickham Shopping Centre is considered to be of a condition which reflects its age. The design of the centre is an internalised mall arrangement that has a limited relationship to the street and surrounding land uses. Accommodating a supermarket, bank, newsagent and some specialty retail, the centre would benefit from redevelopment or relocation to ensure it relates better to and forms an integral part of the Town Centre.

4.2 SOCIAL IMPACTS ASSESSMENT

4.2.1 REGIONAL AND DISTRICT CONTEXT

The draft PPIF states that Wickham will continue to be a mining port town providing local level services to an expanded Cape Lambert workforce, with the potential for Anketell workforce. The draft framework also notes that residential development at Wickham may be limited with people preferring to live in Karratha.

The PPIF also notes that Wickham should not compete with Karratha for higher order services and facilities; and enhanced road connectivity with Karratha in the form of a new coast road is an option being considered, which may have the effect of capping the town's growth prospects.

The endorsement of the PPIF, together with supporting policy or legislation will give further clarity to the form and function of Wickham. The economic base of Wickham is likely to remain a mono-economy based on resource activity and this needs to be considered in future decisions on further normalization of the town.

4.2.2 NORMALISATION

Normalisation of towns is generally accepted to mean the partial or complete handing over of the ownership, operations and maintenance responsibilities of infrastructure elements such as power, water, wastewater etc. by private companies to local governments as their 'public good' aspect increases. This typically occurs in areas like the Pilbara where towns that were originally established by resource companies in the 1960s as essential service bases for their regional operations transitioned to more diversified townsites, and in a number of cases became the seats of local governments.

Normalisation can present challenges for local governments insofar as the operation and maintenance of infrastructure can become a cost burden on authorities that have limited capacity to raise revenue from their rates base.

While the infrastructure of a town may be 'normalised' this does not necessarily mean that a town or community as a whole is normalised. From an economic perspective, many Pilbara towns are effectively single stream economies, that is; they exist because they were established, and to a large extent are maintained to support regional mining operations. Regardless of the ratio of residential employment to FIFO, towns such as Wickham remain essentially resource sector dominated towns. The issue of population growth in and of itself is not the primary determinant of town normalisation and Wickham at its current population of around 2,000, or at points of 3,000, 5,000 or even higher, will essentially be the same type of town. Indeed, it is likely to remain the same type of town even with the introduction of other resource companies into the population mix.


Normalisation of towns in an economic sense occurs when there is a greater degree of diversification in the economy. Were Wickham to become an essential service and or administrative hub servicing the regional resource sector, and were there to be an increase in the concentration of producer service businesses along with a parallel growth in population driven services in the town, then Wickham would be closer to normalisation from an economic and social impact sense.

Normalisation in the broader context requires a redefinition of the role and function of Wickham in the network of population centres both within the Shire and in the broader region. It is reasonable to expect that a larger, more diversified Wickham would draw some population driven and industry support activity away from Karratha but this requires the adoption of a policy and strategy to make that occur. In a single stream economy, where towns are closely aligned to the variability of macro-economic factors, the cessation or rationalisation of mining activity by the major resource companies would effectively see the closure or severe contraction of the town as it would have ceased to serve its useful purpose.










In light of the lack of certainty with respect to further normalisation, the interim position adopted by Rio Tinto for the purposes of the Draft Wickham South Development Plan is to improve the liveability of Wickham for its employee residents, their families and other residents of the town and those that wish to utilise its amenities.

4.3 COMMUNITY FACILITIES ASSESSMENT

Creating Communities, on behalf of Rio Tinto, has undertaken an assessment of the existing community facilities located within the town and provided recommendations for the upgrade and provision of new community facilities based on population increases derived from the implementation of the Development Plan. Rio Tinto acknowledges the importance of providing community facilities which facilitate the growth of the community fabric associated with the town and there is an opportunity as part of the expansion of the town to address some of these issues.



Rio Tinto requested Creating Communities to consider the following issues to be addressed:





-  the impact of expected population growth on the need for local community facilities;
-  the opportunity for Wickham residents to utilise and benefit from community facilities in Karratha, particularly specialist and district/ regional level facilities;
-  the need for indoor sports facilities;
-  the need for youth programs and facilities;
-  the opportunity for future community use of existing school facilities;
-  the facility requirements for planned community investment programs;
-  the potential for community programs and facilities to improve community health and safety;
-  the potential for community programs and facilities to integrate FIFO workers with the residential community;
- and
-  staging of future community facility provision to mirror staging of Rio Tinto's Cape Lambert operations and associated workforce expansion.

The desired outcome is a staged facility provision strategy that responds to identified community needs, which Rio Tinto can carry forward into its feasibility studies for the Wickham South development.



4.3.1 ASSESSMENT OF EXISTING FACILITIES AND COMMUNITY INVOLVEMENT

Community facilities in Wickham are well used. Essential services such as primary education, policing and health are provided in the town. Most regional services such as community development, child protection, secondary education, hospitals, recreation and culture are delivered from Karratha.

Within the town, opportunities exist to participate in a wide range of sport, recreation, art and cultural activities. A 'Baseline Community Assessment' survey of residents, found that residents rate community involvement in Wickham as being good or very good. Infrastructure related issues raised include:











-  concerns about the poor aesthetics, condition, maintenance and amenities at the shopping centre;
-  a desire for upgrades to sport and recreation infrastructure and provision of additional facilities in Wickham for youth;
-  support for the sport and recreation facilities outside the town (e.g. boating facilities, Point Samson etc); and
-  requests for improved public infrastructure (roads, footpaths, community facilities).

Various consultations with the community and key stakeholders by Creating Communities have found that:

-  Considering the size of the Wickham population it is an extremely active community, with 38 identified community groups. The high ratio of young people, extreme summer temperatures, lack of private sector recreation options and the isolation of the town are significant factors underpinning high level of community activity and the need for quality local community, sport and recreation facilities, both indoor and outdoor.
-  In addition the transient nature of the community and the added complexity of a shift and FIFO workforce have created a need for flexible and casual sport and recreation programs. A delivery model is needed to accommodate participants who due to work commitments/rosters are restricted in their participation in routine sporting activity.

4.3.2 COMMUNITY FACILITIES REQUIREMENTS IN WICKHAM

As in many Pilbara towns, sport and recreation is a key element of community life in Wickham. Existing sport and recreation facilities are in average to poor condition and in need of redevelopment. Rio Tinto have responded to this need with plans to redevelop and upgrade a number of sport and recreation facilities at the Wickham Recreation Precinct. The approved project, which is due to start work within months, includes:

-  demolition of existing sports club and residence;
-  construction of a new clubhouse;
-  upgrade of sporting fields;
-  relocation of outdoor courts;
-  modifications to the fencing and play equipment;
-  upgrade the existing club room;
-  build a new dual use path;
-  develop a new parking areas & site access;
-  provide new landscaping; and
-  build a new indoor cricket facility.

In addition to these planned works by Rio Tinto, the research also supports the need for a single indoor sport court. It is recommended the indoor sports court needs to be co-located within the sports precinct.

If the population increases and the ratio of young children remain high, improved amenities and additional leisure water space is recommended at the Wickham Swimming Pool. For a town like Wickham the swimming pool is an essential and treasured community recreation facility, providing a place for children, families and youth to socialise and be physically active. The casual nature of swimming for fitness or leisure suits the irregular work patterns of shift workers. It also provides an important opportunity for FIFO workers to integrate with the residential community. The feasibility of upgrading buildings and providing additional leisure water at Wickham Swimming Pool will require investigation. Information regarding usage, compliance of the existing plant and the potential for Wickham residents to use aquatic facilities at Karratha or Roebourne needs to be considered.

The need for multipurpose community facilities in Wickham is highlighted. The decommissioning of the district high school by the Department of Education and Training has provided facilities to accommodate seventeen community groups and/or services, collectively functioning as a community resource centre. Community facilities are an integral part of the community hubs that are so important to the texture of the town's social fabric. Having places to go and things to do are important to a quality lifestyle and the retention of employees, a recreation precinct is considered vital to the future of Wickham.

The need for informal youth recreation programs in Wickham are supported from the consultation. While the standards indicate that the number of young people would not warrant a dedicated youth centre, the nature of Wickham (i.e. the high ratio of young people, extreme summer temperatures, lack of private sector recreation options and the isolation of the town) supports the need for ongoing youth recreation activities.

In the short term, the current arrangements to utilise the decommissioned high school facilities to house the Shire of Roebourne library service and other community services (i.e. Rio Careers and the David Wirrapanda Foundation) should continue, however, in the longer term, provision of a purpose built library and community resource centre should be considered. This facility should be developed by the Shire of Roebourne and could include service offices and facilities for other Shire of Roebourne staff (i.e. rangers). Ideally it should include an internet research area and a couple of multipurpose meeting rooms, and be co-located with the existing community hall.

More information is required regarding the potential usage of this facility however, there is some evidence to suggest an upgrade of the amenities and equipment would be of great value to Wickham community life, particularly for youth, FIFO and shift workers.

The table below summarises the needs of the Wickham community based on the review conducted by Creating Communities together with the current status. The items listed as scheduled are included in the Wickham Sporting Recreational Precinct project. The items listed as recommended are being included in Rio Tinto's current pre-feasibility study for the town expansion and other items will be considered in further assessment (later stages) by Rio Tinto.

TABLE 4: COMMUNITY FACILITIES REQUIREMENTS FOR WICKHAM

Needs	Review of Literature	Audit	Standards	Consultation	Current Status
Two quality basketball/ netball courts.	√	√	√	√	Scheduled
Two quality tennis courts for local club competition and casual use.	√	√	√	√	Scheduled
Upgraded and extended clubroom amenities to more adequately service oval users.	√	√		√	Scheduled
An indoor cricket court (outdoor facility) and other facilities for casual sporting competitions that are suitable for shift and FIFO workers.	√	√		√	Scheduled
Quality local multipurpose community facilities (indoor) to accommodate a wide range of community activities, groups and services.	√	√	√	√	Recommended
An indoor sports court (multi-marked for basketball, netball, volleyball, badminton and indoor soccer) with café/ bar facility.	√		√	√	Recommended
Quality cricket practice nets at Ros Jones Memorial Oval.	√	√			Incorporate into recommended indoor court facility
Youth recreation programs and facilities including holiday programs, indoor facilities for active recreation, a drop-in facility and new skate park.	√	√		√	Recommended
Improved maintenance of existing squash court facilities.	√	√			Future consideration
Improved aquatic centre and equipment buildings and a new leisure/ toddler's pool.		√	√		Future consideration
Upgrades to the Picture Gardens to be considered jointly by the Wickham Community Association (WCA) and Rio Tinto		√		√	Future consideration

4.4 CONSIDERATION OF FLY IN FLY OUT WORKERS ON TOWNSITE EXPANSION

An analysis has been undertaken by Creating Communities, on behalf of Rio Tinto, to consider potential impacts on the townsite expansion from FIFO workers and their role within the Wickham community.

Rio Tinto is committed to the development of Wickham as a liveable community in both the short and long term and as such has commenced the process of undertaking social and economic impact studies and the development of a plan to promote opportunities and mitigate issues that may arise.

4.4.1 TYPES OF FIFO EMPLOYMENT ARRANGEMENTS

FIFO is a term that is used generically to describe the non-residential workforce. It is often considered that FIFO falls into two categories i.e. the construction and operational workforces, and that these categories are different to each other yet homogenous in themselves. However with the categories of operational and construction, FIFO can be for long-term or short-term placements; they can be different in rosters on the same site; they can be for skilled, unskilled or professional workers; they can be male or female; they can be of any age, socio-economic background or ethnicity; they can be the permanent employment option for a person or a temporary choice.











Furthermore, FIFO is no longer an isolated form of employment. For many people it is the employment form of choice.

4.4.2 INTEGRATION OR ISOLATION

To date, many FIFO camps, no matter where they are located, are managed in such a way to minimise the workers interaction with town residents. In fact, in some cases, interaction is simply not allowed. However integration of FIFO through a planned, quality development approach can offer benefits to both the host community and the FIFO workers. This type of integration is thought to be best suited to permanent operational roles rather than the shorter tenure construction roles.

4.4.3 POTENTIAL BENEFITS TO A TOWN FROM AN IN-TOWN FACILITY

The redevelopment and expansion of Wickham presents an opportunity to build new integrated FIFO facilities in a central location of the town to house permanent operational employees working on a commute arrangement. An integrated approach will assist in allowing more connection between temporary and permanent residents living in the town. This purpose built accommodation is intended to be more integrated into the streetscape and the following principles may guide such a development:

-  view lines both within the development and out from the development;
-  gradation of private to public spaces for residents (different sizes - good quality);
-  facilities either on the street for use of the broader community or in the Town Centre for use of FIFO and residents;
-  permeability/walkability;
-  good street lighting;
-  quality POS and landscape;
-  ability of built-form to be used for other non Rio Tinto uses (e.g. tourist accommodation, service workers accommodation);
-  style to "fit" with the rest of the town;
-  lay-out and signage to make indistinguishable from town; and
-  use of shade (e.g. multi-storey buildings).



A focus will be made on multi-use facilities that can service both FIFO employees and town residents, such as the new sports and recreational precinct project that has been approved by Rio Tinto and is scheduled to start construction in late 2010/early 2011. Work will be undertaken to consider how the temporary residents in the town can contribute to the sporting fabric of the town, despite shift arrangements. For example the upgrading of the “indoor cricket nets” at the outdoor sports courts will meet the need for flexibility and casual sports competitions that are suited to shift and FIFO workers.

Similarly, a separate swimming pool will not be constructed as part of the new in-town FIFO facilities; rather FIFO residents will be encouraged to use the town facilities. The casual nature of swimming, either for fitness or for leisure, also suits the irregular work patterns of shift and FIFO workers, providing an important opportunity for FIFO workers to integrate with the residential community.

FIFO and other occupants of short stay accommodation represent an economic opportunity for Wickham. The Rio Tinto Windawarrie Lodge facility at Tom Price, which is in a centrally located position and caters for short stay, ad-hoc visitors and FIFO workers, was examined in 2008 to understand the economic contribution made to the town from the FIFO workers. On average, those surveyed spent around \$100 per week in Tom Price:

Most workers walked to the Tom Price shopping and recreational facilities once or twice a week for the purposes of spending money.

Most workers spent their money on groceries and take away alcohol. A large number of workers also spent their money at the pub and on takeaway food.








Half of workers surveyed were willing to spend more if alternative spending options were available.

The survey indicated that a presence of a FIFO workforce accommodation in or close to town generates a significant economic benefit to the town. Weekly spending by the 199 workers surveyed indicates a total spend of \$13 000 per week in town (ACIL Tasman, URS internal report for Rio Tinto August 2008). From the survey results it was estimated that on average a typical FIFO worker would spend \$ 5700 per annum in Tom Price resulting in flow on benefits to small businesses in the town. A key determinant for expenditure in town is access to shops and services, with walking distance an important factor.

4.4.4 POTENTIAL NEGATIVE IMPACTS TO A TOWN FROM AN OUT OF TOWN FACILITY




The negative impacts that are generally associated with FIFO camps that are located near towns relate to concerns about anti-social behaviour, the potential usage pressure on existing facilities and services in the town and the impact of a predominantly male cohort into a young family town. Remote or out of town camps are most often used to house construction workforces, and are of a temporary or fixed term duration.

Rio Tinto has management practices and policies in place for the management of off-site construction camps which will be expanded or established to support the Cape Lambert port expansion. Key aspects include:

-  The workforce is encouraged to support local business but must do so in an appropriate manner.
-  Respect and appreciate property.
-  Anti-social behaviour is not tolerated on or off the village site.
-  Village access is via a manned security gate, visitors must have prior approval and rules must be adhered to.
-  On site medical facilities are the first response rather than consume local services.
-  Bussed transfer to site and airport to reduce fatigue and traffic on local roads.
-  Minimise impact on environment through fencing and area access management.



Wickham Townsite Structure Plan

-  Cyclone preparedness plans in place to self manage workforce and facilities.
-  Breach of any rules will be dealt with via disciplinary action and can include removal of accommodation privileges.
-  The tavern is managed under control of the Liquor Control Act 1988 and in-house rules and regulations apply.

In addition to the camp management policies and procedures, Rio Tinto is participating in a Wickham Crime and Safety Forum on a two monthly basis with Shire representatives, State Government agencies, the local school and local police. This Forum may be used to plan for and address issues relating from the expanded camp.

4.4.5 POTENTIAL BENEFITS TO A TOWN FROM AN OUT OF TOWN FACILITY

The existence of remote camps within driving distance from Wickham and other nearby towns could offer an opportunity to the towns if managed in an appropriate manner.

Construction workforces that have one full day off per working shift could be targeted through programs to encourage a positive contribution to Wickham. This may be through ad-hoc use of existing facilities and organizations, involvement in volunteer community projects (i.e. LandCare style programs) or community clean up and improvement programs.

Each of the Rio Tinto camps has an Active Lifestyle Coordinator employee who works in the village to set up training and gym routines. In addition, these Coordinators are responsible to organize rostered non work-day activities for FIFO employees, such as fishing charters and participation in local and community events.







There are potential benefits to Wickham if the Coordinators work with the town community to look for synergistic opportunities such as community volunteering projects (i.e. 'Clean Up Australia').

Each of these factors is being considered in the community aspects of the expansion plans that are being developed by Rio Tinto.

4.4.6 SOCIAL AND ECONOMIC IMPACT RESPONSES

Rio Tinto has commenced the preparation of the appropriate community and economic development responses to their expansion plans.

Key aspects to the actions include:

-  analysis of current situation and potential impacts based on various scenarios;
-  facility/amenity responses including initial budget estimates;
-  community development strategies to make Wickham more family and FIFO friendly;
-  community activation strategies;
-  creation and activation of the sporting and recreational community hubs; and
-  linkage of Indigenous funding and strategies to holistic community outcomes.

5 STRUCTURE PLAN

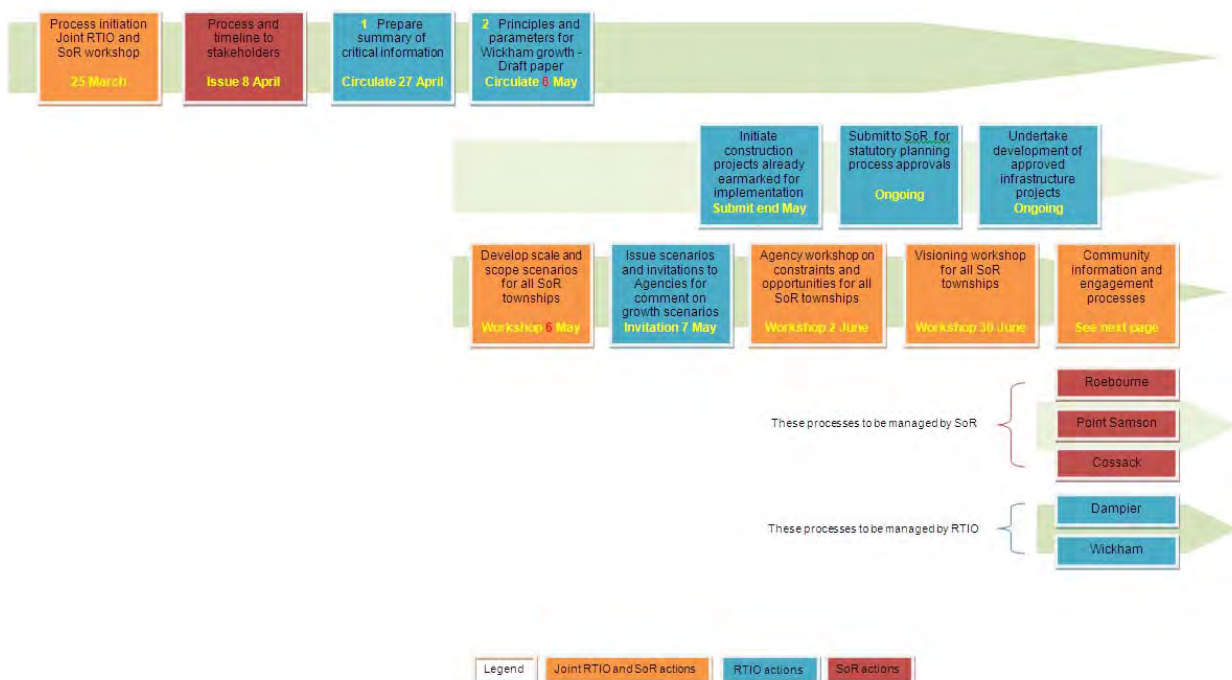
5.1 BACKGROUND TO THE STRUCTURE PLANNING PROCESS

In March 2010, the Shire of Roebourne and Rio Tinto agreed to work collaboratively to address growth and development options and opportunities for Wickham town site.

Rio Tinto was planning for an expansion of its operations at Cape Lambert and needed to consider the resultant construction and operational workforce requirements and the Shire of Roebourne was in the midst of preparing the Karratha City of the North development strategy as part of the state government’s Pilbara Cities initiative. The Shire was conscious that developments in the towns surrounding Karratha needed to be considered as part of an overall Shire growth planning strategy.

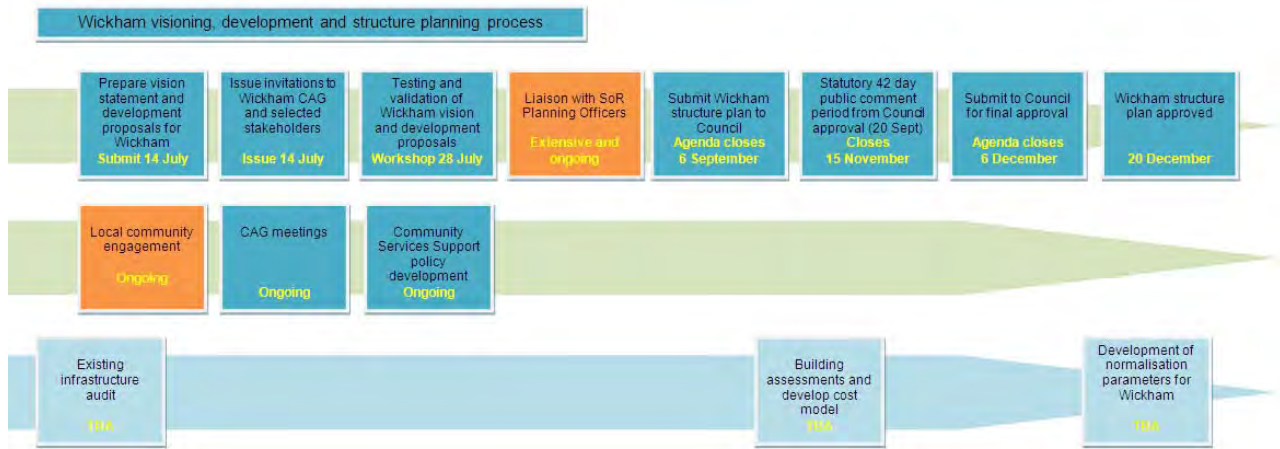
Resource companies other than Rio Tinto were planning mining and port operations in the Anketell/Port Dixon area adjacent to Wickham. The accommodation requirements of construction and operational workforce for non-Rio Tinto personnel were therefore also requested to be considered.

Rio Tinto engaged Taylor Burrell Barnett to prepare a structure plan for Wickham and CCS Strategic was engaged to coordinate and facilitate meetings between Rio Tinto, the Shire and other stakeholders as part of the structure plan visioning process. A process flowchart was developed to outline the sequence of meetings and workshops to be held as part of this process for all of the towns in the Shire (excluding Karratha). Wickham was the first of the towns to commence this process. The following process flowchart depicts the initial workshop sessions undertaken for Wickham and continues into community engagement activities.



The Wickham engagement process initially envisaged, and depicted below, has been varied with the community discussions postponed subject to clarification of a number of issues that had the potential to significantly influence planning for the town’s expansion, including the practicalities of third party mining companies housing their future workforce in Wickham and the State Government’s objectives in this regard.

Wickham Townsite Structure Plan



A series of 4 workshops have been held to date involving a variety of representatives from Rio Tinto, the Shire and various government agencies. Included, as **Appendix B** is a summary of the key outcomes of each of the workshops and the attendee list.

The outcome of this process is the preparation of a Draft Structure Plan (refer **Figure 7 - Draft Structure Plan**). The Structure Plan has been prepared to provide an overall development context for accommodated an expanded population in Wickham. The Structure Plan will provide an important tool to guide future potential development of Wickham, particularly within the area of the Wickham South Development Plan, but also for future Development Plan areas.

A formal consultation process is proposed for both the Structure Plan and the Development Plan, including forums and community information and feedback sessions. Arrangements are being made for this consultation to take place in early November.

5.2 KEY PRINCIPLES

The following objectives have been identified for the Wickham town site and will be used as the basis for setting the key Principles of the Structure Plan. They have been selected following consideration and analysis of the issues and opportunities for accommodating an expanded population in Wickham.

Objectives:

1. To create Wickham as a Safe, Attractive, Friendly, Effective (SAFE) place.
2. To Create a clearly identifiable town centre.
3. To provide an urban environment that facilitates sustainable growth.
4. To achieve greater physical and social integration.
5. To provide a diversity of housing types and land ownership top cater for a diverse population.
6. To identify the town site boundary for Wickham to meet future growth needs.





These objectives are diagrammatically represented in **Figure 8 – Design Principles Plan**.

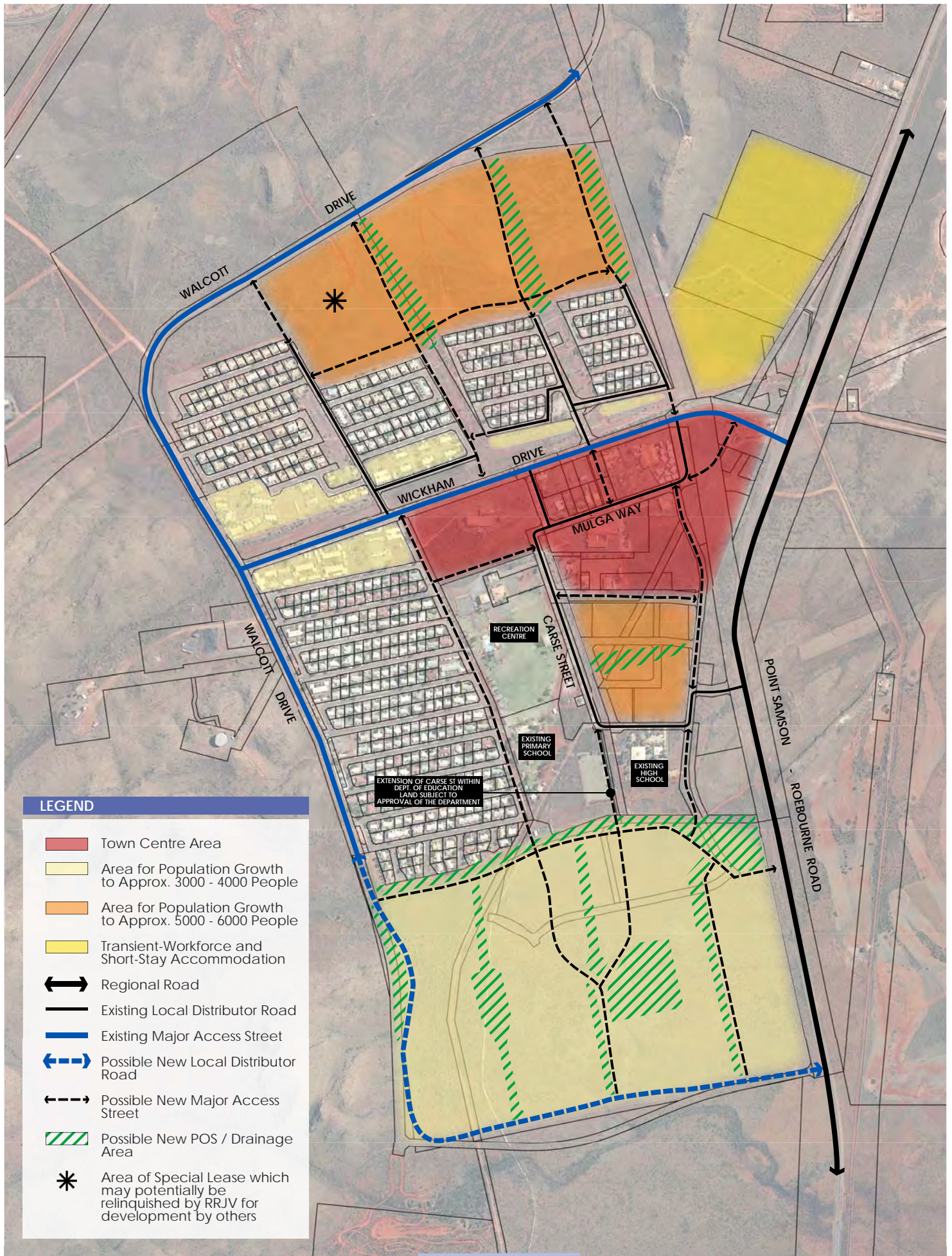


PRINCIPLES

1. Wickham as a **S.A.F.E.** place
2. Provide a clearly **IDENTIFIABLE TOWN CENTRE**
3. An urban environment that facilitates **SUSTAINABLE GROWTH**
4. Achieve greater physical and social **INTEGRATION**
5. Provide a **DIVERSITY** of housing types and land ownership to cater for a diverse population
6. Identify the townsite boundary for Wickham to meet future growth needs

LEGEND

-  **INDICATIVE TOWN CENTRE**
- Strong linkages
-  **SUSTAINABLE GROWTH OF TOWN**
-  **INTEGRATION**
-  **INDICATIVE TOWNSITE BOUNDARY**



STRUCTURE PLAN










Wickham Townsite Structure Plan

0m 100 200m

s: 1:12500@A4
d: Nov. 2010
j: 08/073

figure
07

Taking into consideration these objectives, the following Key Principles of the Structure Plan are:

-  to consolidate and expand the pattern of land use for Wickham based on the existing zoned 'footprint' of the town;
-  improve and build upon the road network existing within the town;
-  to achieve functional areas of POS;
-  to provide a focal point for entry into the Town Centre Area;
-  to achieve sustainable growth for the urban environment;
-  to provide diversity of housing types and land ownership;
-  to guide the preparation of future Development Plans so that coordinated planning outcomes can be achieved;
-  to revitalise the Town Centre Area; and
-  to identify areas for potential development by third parties.

5.3 PLANNING FOR A POPULATION OF 3,000

5.3.1 IMPACT OF TOWNSITE EXPANSION ON RETAIL AND CORE GOVERNMENT SERVICES

An analysis has been undertaken by Pracsys, on behalf of Rio Tinto, to determine the potential impacts associated with an increase to the town of Wickham's population to 3,000 persons.

It is important to note that the demand for such services as retail, health, education and policing in a regional context is not a linear relationship. It is not possible to say, except in the broadest sense, that an increase in the population of Wickham of say 50% will result in a similar order of increased demand for human resources in selected areas. In addition, the creation of new employment in the town does not necessarily mean that town residents such as spouses might fill the new jobs. This is dependent on the nature of the job and the training, experience and professional qualifications required to fill the position.

5.3.1.1 RETAIL

The Wickham Woolworths store loses a considerable amount of business to the Karratha Woolworths store which is regarded as the top or second top performing Woolworths store in Australia. Expenditure leakage, primarily to Karratha, is expected to be very high to extremely high for general supermarket and café / restaurant spending and approaching 100% for other categories. This is for two main reasons: one is the very limited availability (and, in some cases, complete unavailability) of retail offerings in certain areas in Wickham (e.g. specialist retail and comparison goods); and secondly, the obvious gravity effect that a larger population centre has on surrounding centres. The mooted plan of Karratha as a Pilbara City is expected to amplify that effect.

The total floorspace anticipated for Wickham at a population of approximately 3,000 persons and incorporating the catchments of Roebourne and Point Samson, is estimated at between approximately 2,500 and 3,000m² of net lettable area. The current provision of floorspace is within this band which suggests that the total floorspace is less of an issue than its configuration and the quality of the retail offering.

3,000m² of retail would generate approximately 100 direct jobs depending on the floorspace productivity and the degree of activity lost to Karratha and other centres. This translates to about an additional 20-30 FTEs in the retail sector in Wickham. This is not likely to translate to an equivalent increase in demand for housing in Wickham as local labour is likely to be utilised along with Karratha labour.



5.3.2 EDUCATION

A representative from the Department of Education and Training has suggested that with a population growth of up to 3500, the existing primary school within Wickham would manage the increase in student numbers with additional demountable classrooms. For instance, if the primary school numbers were to increase to a projected 585, the Department would provide additional transportable accommodation to the order of 5 to 6 classrooms. A review of the site suggests there is sufficient land area to accommodate the additional classrooms.

Beyond a population of 3500 persons, the Department of Education and Training has suggested looking at potentially reclaiming the former High School site for use as a second primary school. There would be no plans for a high school or district high school facility in Wickham at a population of 3000 persons or 5000 persons, with the current arrangements for travel to Karratha remaining in place.

5.3.3 POLICING

As mentioned with health and education, police resources are not assigned to specific stations on the basis of population alone but rather on the demand for specific police functions. Typically, the indicators for allocating police resources may include the incidence of crime and anti-social behaviour along with the rate of traffic accidents in a particular district. Pracsys advise, based on their understanding of the staffing levels at stations across the Pilbara, it is possible that the Wickham station may be extended by an additional constable and potentially the addition of part time support staff although this supposition is dependent on confirmation by the regional superintendent. In addition to the uniformed officers, Karratha also has one detective sergeant and two detectives.

5.3.4 HEALTH

The demand for GP services in Wickham appears to be met by the private sector and it is unlikely that the public health system would compete in this area outside of the current levels of health servicing at the established centres. From the State's perspective, servicing health demands is currently based on the clinical services framework where cost is a major factor in the supply of services. Under this arrangement the WA Country Health Service determines the range and level of health services to be delivered in the region and accordingly determines the most efficient delivery model, which is heavily slanted towards the main population centres. The department is moving to an activity based funding mechanism over the next 2-3 years which may consider more closely regional population trends on the delivery of services.

Pracsys advise, the implications for employment generation in Wickham as a result of the town expansion are not expected to be substantial. It may be that the population growth warrants an additional 0.5 GP FTE and perhaps one or two additional support staff in the practice. It may also mean an increase in the incidence of allied health services available through the Wickham Health Centre on a rotational basis.

5.4 PLANNING FOR A POPULATION OF 5,000

5.4.1 IMPACT OF TOWNSITE EXPANSION ON RETAIL AND CORE GOVERNMENT SERVICES

An analysis has been undertaken by Pracsys, on behalf of Rio Tinto, to determine the potential impacts associated with an increase to the town of Wickham's population in accordance with the Structure Plan. The Structure Plan will facilitate growth within the town to a population of approximately 5,000 persons.

The expansion of Wickham to a population of 5,000 persons has the potential to change the nature of the town itself and raise it to the level of a sub-regional centre. It should be noted however that there is no linear connection between population size and the provision of services in regional communities. The provision of a range of government services in particular is more a function of the internal decisions of agencies regarding the efficiency and effectiveness of planned service delivery in a regional sense, rather than being related to population growth per se. Pracsys advise that Wickham at a population of 5,000 persons, is still most likely to function as a satellite centre to Karratha rather than assuming the profile of a regional town such as Tom Price or Newman which have a concentration of service delivery that may be a function of their relative size and isolation.

5.4.1.1 RETAIL

Pracsys state that an increase to the town's population to 5,000 persons does not necessarily justify a significant increase in retail floorspace based on existing levels. Pracsys advise that even with a planned floorspace increase to Woolworths (as advised by Woolworths) to approximately 4,000m² and a supporting specialty retail of 1,000 to 2,000m² there is a strong probability that Wickham residents will still tend to use Karratha for a significant proportion of the standard household expenditure.

Additional employment generated by the expansion of Wickham shopping centre to support a population of 5,000, would result in an additional direct employment of approximately 50 to 90 FTEs if fully tenanted. Due to opportunities to use existing local labour and labour from Karratha, it is unlikely that this increase in demand for labour will equate to a corresponding demand for housing.

5.4.1.2 EDUCATION

At a population of 5,000, primary school enrolments may exceed 650, consisting of kindergarten to year 7 students. Expansion of the Wickham primary school is possible but is likely to be split over two campuses with the kindergarten to year 3 groups catered for in the existing school and the year 4 to year 7 students housed at the former Wickham high school campus which is located close by. Having said this, enrolments totalling beyond 600 students would probably necessitate the introduction of a second primary school in the town with staffing approximating the current levels of the Wickham primary school.

The old Wickham high school site may potentially be reactivated should population growth and demographic mix warrant it, but it is worth noting that Wickham is effectively a satellite town to Karratha and the preferred delivery model is expected to be a continuation of the current arrangement for Wickham high school aged students to attend Karratha.

5.4.1.3 POLICING

Pracsys advise Police resources in regional areas are allocated on the basis of demand as suggested by the incidence of criminal and antisocial behaviour and the number and severity of traffic incidents in a particular region. The issue of police resourcing seems to be the determination of what sort of town Wickham will be from a policing perspective at a population of 5,000 persons. This is an unknown at this stage but given that there is already a significant police presence at Karratha and at Roebourne, it is reasonable to assume that the police resourcing for Wickham may approximate that of Tom Price, or perhaps be marginally higher. Pracsys advise the decision for additional police would be taken in context of the police workload in Roebourne as well as the population increase in Wickham.



5.4.1.4 HEALTH

Representatives of the Department of Health have suggested that Wickham and Roebourne would be considered from a regional perspective; with increased health resources focused on accident and emergency likely to be centred at Roebourne. The State Government's focus would remain at Roebourne driven by a "closing the gap" policy directive. The health service relationship between Wickham and Roebourne is considered as a single business unit with two outlets. The WA Community Health Services West Pilbara operations are structured on a hub and spoke model of service delivery around the proposed Karratha Health Campus that is being re-developed to cater for an increased general population in the Shire of Roebourne, inclusive of Wickham. The master planning of the Nickol Bay health campus has been made possible through a five year, \$150 million grant through the Royalties for Regions program.

Following the closure of Gemini Medical's Wickham facility on or about 15 October, the Pilbara Health Network has committed to the provision of a General Practitioner within Wickham. The Pilbara Health Network, with its partners Rio Tinto, WA Country Health Service, the Pilbara Development Commission and Rural Health West will provide locum GPs until a fulltime GP is found. The corporate view on servicing Wickham at a population of 5,000 persons is unknown at this stage, however local health organisations and Rio Tinto have been working towards maintaining GP services at Wickham whilst assessing opportunities to establish a comprehensive primary health care centre.

5.5 LANDUSE DISTRIBUTION AND RATIONALE







5.5.1 RESIDENTIAL DEVELOPMENT AND PLANNING FOR GROWTH

Residential expansion areas have been depicted in the Structure Plan generally consistent with existing Residential and Urban Development zoned land in the town. The Structure Plan does not propose to extend the residential areas any further, acknowledging the extent of appropriately zoned land which is yet to be developed, and the forecast population growth for Wickham, especially in the context of the north west region and other surrounding towns.

The Structure Plan recommends a staged approach to residential subdivision in Wickham based on two forecast growth population thresholds. In this regard, south Wickham is proposed to be developed first, in accordance with the Development Plan the subject of this report. In addition to south Wickham, residential consolidation opportunities for central Wickham (generally land located along Wickham Drive), have also been identified. The consolidation of undeveloped land and possible redevelopment of poorly utilised land will ensure a better use of land resources. The development of south and central Wickham will provide for an overall town population of 3,000 to 4,000, dependent on the density of development.

The remaining undeveloped Residential zoned portions of Wickham have been depicted for longer term population growth based on a future Wickham population of 5,000 to 6,000 people. These areas are depicted in north Wickham, beyond the existing northern residential area, and adjacent to the revised Town Centre Area depicted under the Structure Plan, to the south of the shopping centre. The northern area will provide for Townsite expansion, whilst the centrally located land provides an opportunity for consolidation of the town and the introduction of different forms of housing in order to take advantage of the close proximity of this land to the primary recreation area of the town and the shopping and other community facilities located within the Town Centre Area.

The identification of south Wickham as part of a first stage of growth under the Structure Plan is based upon the following:

-  limited site constraints (e.g. environmental, topographical etc) meaning development can be undertaken quickly and conveniently without (to be expected) exorbitant costs;
-  the land is ready for servicing (i.e. reticulated water and sewer, power, telecommunications etc) without excessive infrastructure upgrade and associated cost;
-  represents a logical extension of the existing town based on being at the edge of the existing developed part of the town (southern portion) and greater constraints associated with other undeveloped land;
-  is conveniently accessed via the existing road system;
-  provides flexibility for future residential density allocation to be determined at the Development Plan stage; and
-  the land is contained within the Robe River JV Special Lease area and is Rio Tinto's preferred development option at this stage. It is Rio Tinto's intention to undertake the development of south Wickham (at least for part of) as a priority and commence construction as soon as all necessary approvals have been obtained.

5.5.2 TRANSIENT WORKFORCE ACCOMMODATION

An area has been identified for Transient Workforce and Short Stay Accommodation in the north east portion of the Structure Plan area. The location of this form of Accommodation is generally consistent with land that is zoned Transient Workforce Accommodation under TPS 8. Taking into consideration the need to provide additional areas of Transient Workforce Accommodation based on the growth of the north west region mining industry, the accommodation area has been extended, generally south to Wickham Drive, which will also facilitate a high level of access convenience to the Town Centre Area.

Transient Workforce Accommodation and Short Stay Accommodation is also proposed to continue to be provided within the Town Centre (Wickham Village) and on redeveloped sites in close proximity to the Town Centre (including Wickham Lodge and sites on Cajiput Way and Saltbush Court). These sites are proposed to be redeveloped to a standard commensurate with their Town Centre location and will offer the opportunity to increase the density of development in the Town Centre.

5.5.3 TOWN CENTRE REVITALISATION

Wickham has a well located core community land use pattern, however it is underutilised. The Structure Plan proposes to build upon the existing core community land use pattern in order to revitalise the Town Centre Area. It will be important for the Town Centre Area to be revitalised in order to create a sense of place within the town. Existing community related uses such as the Recreation Centre and Oval; Primary School; and High School building are retained at the core of the town. To the north of these areas is the Town Centre Area.







Consolidation of the Town Centre Area will facilitate the revitalisation of community elements associated with the town by providing an important community hub and meeting place. The Structure Plan provides an emphasis on connectivity to the Town Centre Area to facilitate ease of access and encourage the local population to frequent community areas.



Facilities such as the outdoor cinema could be relocated to the Town Centre Area to reinforce a civic node for the town. Grouping such uses in close proximity to a new main street, linking with Wickham Street, can assist with achieving a core community hub. Synergies between the community node and an expanded and revitalised commercial centre can be achieved in order to provide a community focal point.

A key element of providing good community design will be to provide community facilities which will compliment the different forms of accommodation (i.e. permanent residential versus FIFO) evident within the town.

An increase in population in Wickham will necessitate some expansion of retail uses and commercial uses. The Structure Plan depicts a Town Centre Area which will facilitate the necessary expansion under a 3000-4000 population scenario and also under a 5000-6000 population scenario. Key elements of the Town Centre under the Structure Plan and depicted on **Figure 9 – Town Centre Revitalisation Masterplan**, are:

-  compact and central to the remainder of the core Wickham population;
-  a mix of uses providing a range of facilities to residents within the town to provide sustainable and integrated development offering, amongst other things, diverse housing choice, commercial, retail and civic uses;
-  provide easy and convenient accessibility to the Town Centre;
-  provide a Main Street function with high exposure to Wickham Drive;
-  provide local employment opportunities; and
-  provide opportunities for incremental development and growth.

The Town Centre Area is generally consistent with that as zoned under TPS 8. Some differences include an extension of the Town Centre Area under the Structure Plan west and east along Wickham Drive, in order to enhance the core Town Centre and increase exposure to Wickham Drive. This will also assist with facilitating a greater sense of place. As a result of these extensions, the southern portion of the Town Centre as zoned under TPS 8 has been exchanged for a future population growth area.

The lack of a street presence to the retail uses as a result of a highly internalised shopping centre, has a detrimental impact on the retail businesses due to lack of exposure, offers an unattractive and uninviting shopping experience and creates unfriendly and unsafe environment for street users and shoppers. The Revitalisation Plan for Wickham Town Centre must provide a framework for future main street based retail and other commercial development, whilst recognising the limited opportunities for business growth and development in town. The Structure Plan provides a consolidation of the Town Centre Area along Wickham Street and at the point of entry into the town to assist with providing future business exposure, and a core centrally accessible shopping precinct which is easily accessible by all residents within the town.

A more attractive street environment is an important aspect of revitalising the town, with soft landscaping, pedestrian paths, street parking embayments, road carriageway realignments and new roads possible under the Structure Plan.

There is the possibility to undertake the redevelopment of the land currently occupied by the Wickham Medical Centre on Crown Reserve set aside for ‘hospital’ purposes, under the Structure Plan. A new medical centre could occupy the eastern portion of the site, bringing the building and the use up to the street and forming a critical component of the town centre (refer **Figure 9**).

A new high exposure development site for a motel and a mix of other commercial and residential uses could possibly be provided on UCL at the entry to town, offering new business opportunities and improving the entry to town.



LEGEND:

- Commercial
- Retail
- Permanent Residential
- Fly In / Fly Out (FIFO) Accommodation
- Civic
- Hospital Reserve

- NOTES:**
- Town Centre Revitalisation Masterplan*
- Key Components of Plan:
- 1** Consolidated and easily identifiable town centre;
 - 2** Highly accessible road and pedestrian connections;
 - 3** Landscaping of town entry road to increase amenity;
 - 4** Main Street based shopping and other commercial uses with buildings designed to address the street;
 - 5** Civic-Community precinct to accommodate uses relocated from the former High School;
 - 6** Enhance the range of uses in the town centre through the introduction of medium to high density residential and mixed use;
 - 7** Continue to build upon the existing and planned recreational assets in the town centre;
 - 8** Identification of a prime development site on the entry to town, subject to Crown land release;
 - 9** Potential to utilise the undeveloped portion of the 'Hospital Reserve', or redevelop the entire site, for a range of uses to enhance, and create a diverse, town centre, including medical, commercial, high density residential and accommodation for workers employed on a FIFO arrangement (operational workforce);
 - 10** Identification of surplus 'Town Centre' zoned land for potential housing development with easy access to town centre uses, subject to Crown land release;
 - 11** Opportunities to redevelop or refurbish the existing shopping centre to enhance the 'shopping experience' and orient the building to address the Main Street;
 - 12** Redevelopment of Wickham Village FIFO, with buildings and facilities integrated into the streetscape, high standard buildings and landscaping which 'fit' with the rest of the town and able to accommodate company and non-company workers (i.e., service workers);
 - 13** Rationalisation of road and drainage reserves, with opportunity for surplus land to be developed for medium to high density residential.

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Implementation of the vision for the town centre, as depicted in **Figure 9 – Town Centre Revitalisation Masterplan**, will proceed on a staged basis and in such a manner so as not to compromise the overall intent and objectives of the Plan.

The following priority implementation projects for the town centre have been identified through this structure planning process, with particular regard to the immediate accommodation requirements and the outcomes of the stakeholder and community feedback sessions:

1. Facilitate the development of a highly accessible town centre through enhanced road and pedestrian connections, including new north-south and east–west connections to the town centre;
2. Landscape key town centre roads, including tree-lined boulevard for Wickham Drive and upgrading of Mulga Way;
3. Construct new Town Administration building in key corner location to anchor and define the Main Street;
4. Investigate re-use or redevelopment of former Child Health Clinic for GP clinic;
5. Upgrade Community Hall and investigate opportunity to accommodate additional community uses relocated from the High School;
6. Continue to build upon the existing and planned recreation assets in the town centre through the incorporation of a multi-use indoor sports facility, youth centre, upgrade of swimming pool and shelters and new active play structures to replace equipment currently accommodated at Saylor Park;
7. Facilitate the release of Crown Land in the town centre for development;
8. Further discussions with the State Government regarding the excision of surplus land from the ‘Hospital Reserve’ or relocation of the medical facilities and redevelopment of the site for a range of uses to enhance, and create a diverse, town centre, including medical, commercial, high density residential and accommodation for workers employed on a FIFO arrangement (operational workforce);
9. Rationalise the ‘Town Centre’ zoned land through rezoning of land south of Carse Way to ‘Residential R60’.

These projects have been identified in **Figure 10 – Town Centre Revitalisation, Priority Implementation Plan** and will be the subject of review and refinement over time.

5.5.4 OPEN SPACE, DRAINAGE AND RECREATIONAL FACILITIES

Areas suitable for possible new POS and drainage have been depicted on the Structure Plan. Drainage has generally been depicted along the main access streets which run in a north-south direction. Areas of local POS have been depicted centrally within the residential population catchment in order to maximise the accessibility of POS to residents (sound walkable catchments).

5.5.5 EDUCATION FACILITIES

It is not proposed to include any new educational facilities in the Structure Plan at this stage. The existing primary school and high school facilities within the town will be utilised as needed, and facilities will be expanded on existing grounds as population growth occurs.



LEGEND:

- Commercial
- Retail
- Permanent Residential
- Fly In / Fly Out (FIFO) Accommodation
- Civic
- Hospital Reserve

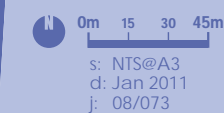
NOTES:

Town Centre Revitalisation - Priority Implementation Plan

Key Components of Plan

- 1** Facilitate the development of a highly accessible town centre through enhanced road and pedestrian connections, including new north-south and east-west connections to the town centre;
- 2** Landscape key town centre roads, including tree-lined boulevard for Wickham Drive and upgrading of Mulga Way;
- 3** Construct new Town Administration building in key corner location to anchor and define the Main Street;
- 4** Investigate re-use or redevelopment of former Child Health Clinic for GP clinic;
- 5** Upgrade Community Hall and investigate opportunity to accommodate additional community uses relocated from the High School;
- 6** Continue to build upon the existing and planned recreation assets in the town centre through the incorporation of a multi-use indoor sports facility, youth centre, upgrade of swimming pool and shelters and new active play structures to replace equipment currently accommodated at Saylor Park;
- 7** Facilitate the release of Crown Land in the town centre for development;
- 8** Further discussions with the State Government regarding the excision of surplus land from the 'Hospital Reserve' or relocation of the medical facilities and redevelopment of the site for a range of uses to enhance, and create a diverse, town centre, including medical, commercial, high density residential and accommodation for workers employed on a FIFO arrangement (operational workforce);
- 9** Rationalise the 'Town Centre' zoned land through rezoning of land south of Carse Street to 'Residential R60'.

TOWN CENTRE REVITALISATION - PRIORITY IMPLEMENTATION PLAN
Wickham Townsite Structure Plan



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5.6 MOVEMENT NETWORK

5.6.1 STRUCTURE AND ACCESS

The Structure Plan recommends (and depicts) the location of possible local distributor roads and major local access streets in a grid layout based generally on a north-south and east-west alignment. This configuration will provide for ease of access for residents to the Town Centre Area, primary recreation area and the regional road network. The road configuration links appropriately, where possible, with existing constructed roads which generally feed back to Wickham Drive at the heart of the town. The proposed road network takes into consideration possible constraints and reacts accordingly to natural aspects, such as topography.