

Mandogalup

Land Use Planning and Context Report



Document History & Status

Mandogalup

Land Use Planning and Context Report

Taylor Burrell Barnett Town Planning and Design

Level 7, 160 St Georges Tce
Perth WA 6000
Phone: 9226 4276
admin@tbbplanning.com.au

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1.0 Introduction

1.1 Background

Land use planning for Mandogalup has been uncertain for many years, due to the proximity of the Alcoa residue disposal areas (RDAs) and the Kwinana Industrial Area to the west.

The Kwinana Industrial (including Air Quality) Buffer was originally established in 1992. In 2010, the Western Australian Planning Commission (WAPC) revised the existing buffer in response to a recommendation by the Departments of Health and Environment and Conservation. The buffer was expanded to one kilometre from the north and north-east boundary of the Alcoa RDA and an additional 0.5-kilometre non-residential transition zone was also applied in this location to recognise an area of uncertainty associated with potential dust impacts in this area.

In June 2017, the Environmental Protection Authority (EPA) provided the Minister for Environment with advice under section 16(e) of the *Environmental Protection Act 1986* titled “Consideration of potential health and amenity impacts of dust in determining the size of a buffer for urban development in the Mandogalup area”. The advice defined four sub-areas on the basis of air quality and amenity impacts as outlined in the EPA’s advice, and includes the following (refer **Figure 10** included in **Section 2.10** of this report):

- Area A: located in the eastern area of Mandogalup (abutting the Kwinana Freeway) there are negligible health risks or likelihood of unreasonable amenity impacts from dust produced by the RDA (urban development has since proceeded in this area);
- Area B: health and amenity impacts appear unlikely but further investigations are required; and
- Areas C & D: air quality in areas to the north and north-east of the RDA does not appear to currently meet the revised National Environment Protection (Ambient Air Quality) Measure goal for air quality, under both current and planned (reduced) future RDA operation. There is also a potential for amenity impacts.

In response to the 16(e) advice, the Minister for Planning requested the WAPC to commence preparing an improvement plan over rural and urban deferred zoned land to the north, south and east of Alcoa’s RDA (Areas, B, C and D). The WAPC subsequently resolved to initiate Improvement Plan No. 47 and give consideration to all development scenarios as part of the investigations to inform the Improvement Scheme, including rural, urban and industrial.

Improvement Plan 47 – Mandogalup was gazetted on 12 April 2019, and affects approximately 330 hectares of land in the Mandogalup locality in the City of Kwinana. The purpose of Improvement Plan 47 is to enable the WAPC to advance the planning of and development within the Improvement Plan area, and includes authorising the preparation of an Improvement Scheme by the WAPC.

1.2 Methodology

Taylor Burrell Barnett has been engaged by the Department of Planning, Lands and Heritage (DPLH) as the lead consultant to prepare the Mandogalup Improvement Scheme with the support of a multi-disciplinary consultant team. The preparation of the Mandogalup Improvement Scheme (Improvement Scheme) will be completed in the following three stages:

Stage 1: Project Inception

- Project Plan
- Stakeholder Engagement Strategy

Stage 2: Background Studies and Technical Investigations

- Background Studies and Technical Investigations
- Development Vision and preparation of four Land Use Scenarios (Rural, Residential, Industrial/Commercial and Mixed) (including community and stakeholder consultation)

Stage 3: Land Use Plan and Improvement Scheme

- Draft Land Use Plan
- Draft Improvement Scheme

This Land Use and Planning and Context Report has been prepared as part of Stage 2. This report provides the relevant background to the Improvement Scheme including the subject area context, planning framework and relevant technical matters including traffic, services, environmental, bushfire, and land demand considerations and analysis. The report also provides an overview of the opportunities and constraints relevant to the subject area.

The findings in this report will be used to guide the community and stakeholder consultation process, in accordance with the community and stakeholder consultation, and inform the preparation of the following four Land Use Scenarios;

- Scenario 1: Residential
- Scenario 2: Industrial / Commercial
- Scenario 3: A combination of land uses in Scenarios 1-2
- Scenario 4: A combination of land uses in Scenarios 1-2, with the addition of Regional Open Space

A Rural Scenario was also originally prepared, however on the basis of that there was limited community and stakeholder support for this scenario at the Visioning and Scenario Workshops, was not progressed.

The four Land Use Scenarios will be presented to the WAPC, who will determine the preferred Land Use Scenario, which will form the basis of a spatial plan and subsequent draft Land Use Plan. The draft Land Use Plan will address the following:

- Site conditions and constraints;
- Interface issues and land use compatibility;
- Regional and local movement networks;
- Proposed land uses, zoning and reserves;
- Land use permissibility;
- Development and subdivision requirements;
- Guidance on staging of development;
- Infrastructure protection, provision, coordination, servicing and staging plans;
- Water and drainage management; and
- Items for inclusion in a potential future developer contribution plan.

The format and content of the draft Land Use Plan is to generally align with the WAPC's Structure Plan Framework (WAPC, 2015). The Land Use Plan will be used as the basis of the draft Improvement Scheme.

This report, along with the technical appendices, will be updated following the selection of the agreed preferred Land Use Scenario.

1.3 Subject Area

The subject area is located in Mandogalup, approximately 25 km south of the Perth CBD within the jurisdiction of the City of Kwinana (**Figure 1**). The subject area boundary has been informed by the extent of Improvement Plan 47, which is discussed further in **Section 2.3** of this report. The subject area is bound by various landholdings to the east, Rowley Road to the north, Anketell Road to the south, and the Kwinana Industrial Area (KIA) and Bush Forever site 268 to the west. The Kwinana Freeway is located immediately east of the subject area.

1.3.1 Sandwich Lots

West of the subject area, there are seven lots identified as “sandwich lots”, which fall outside the Improvement Plan 47 boundary, and are also located outside of the Hope-Valley Wattleup Redevelopment Scheme Area (refer **Figure 1**). These lots are commonly referred to by the City of Kwinana as “sandwich lots”, due to their location between two distinct planning frameworks. The DPLH agreed to consider these lots as part of the Mandogalup project at the request of the City of Kwinana. It is noted that as the sandwich lots are located outside of the Improvement Plan 47 boundary, they will not form part of the future Improvement Scheme which will be prepared for the subject area.

1.4 Legal Description and Ownership

The legal description of the land is described in **Appendix A**. As demonstrated in **Appendix A** and **Figure 1**, the land ownership within the subject area is significantly fragmented. *(Note: Appendix A has been removed from this report for the purpose of public advertising to maintain confidentiality of landowners).*

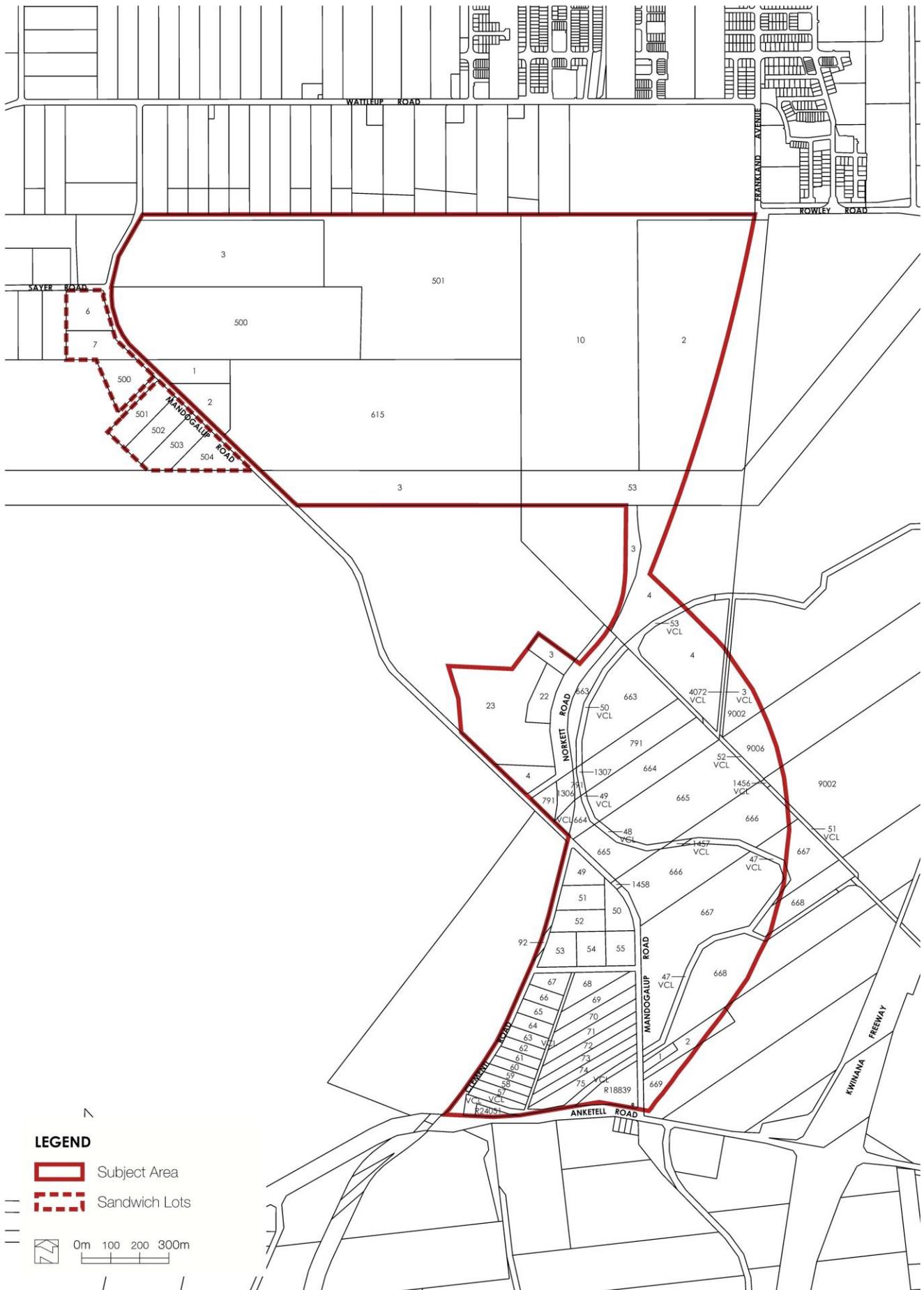


Figure 1: Subject Area

1.5 Subject Area Description

The subject area currently accommodates a range of rural, rural residential and horticultural land uses. An operational sand quarry is located in the northern edge of the subject area. It is understood an application has been made to extend the sand quarry over the eastern edge of the subject area, and associated clearing of 35 ha of vegetation, which is anticipated to be operational for a period of 10 years following obtaining approval.

A Resource Enhancement Wetland (UFI 6610), Wattleup Lake is located on the north-western corner of the subject area. A Multiple Use Wetland is located over southern portions of the subject area (Mandogalup Swamp). A 100 ha Bush Forever site is located adjacent to the subject area's western boundary, with a 1 ha portion of this located within the subject area. Pockets of remnant vegetation are scattered throughout the subject area (refer **Figure 2**).

The Dampier to Bunbury Natural Gas Pipeline (DBNGP) dissects the southern portion of the subject area from the eastern to the western boundary.

The Peel Main Drain (PMD) also dissects southern portions of the subject area.

Western Power Restricted Zones also through central and southern portions of the subject area, over 132 kv and 330 kv power lines.

The topography of the subject area is generally varied and influenced by current land use. The northern section of the subject area shows topography generally sloping east to west from 35 and 40 mAHD to 10 mAHD at the north-western corner of the subject area. In the southern section of the subject area, there are topographic mounds at 20 to 23 mAHD which generally slope towards the PMD (12 to 13 mAHD). The Main Drain is shown as a more incised channel near the southern end of the subject area and shallower amongst the market garden areas of Mandogalup Swamp (13 mAHD).

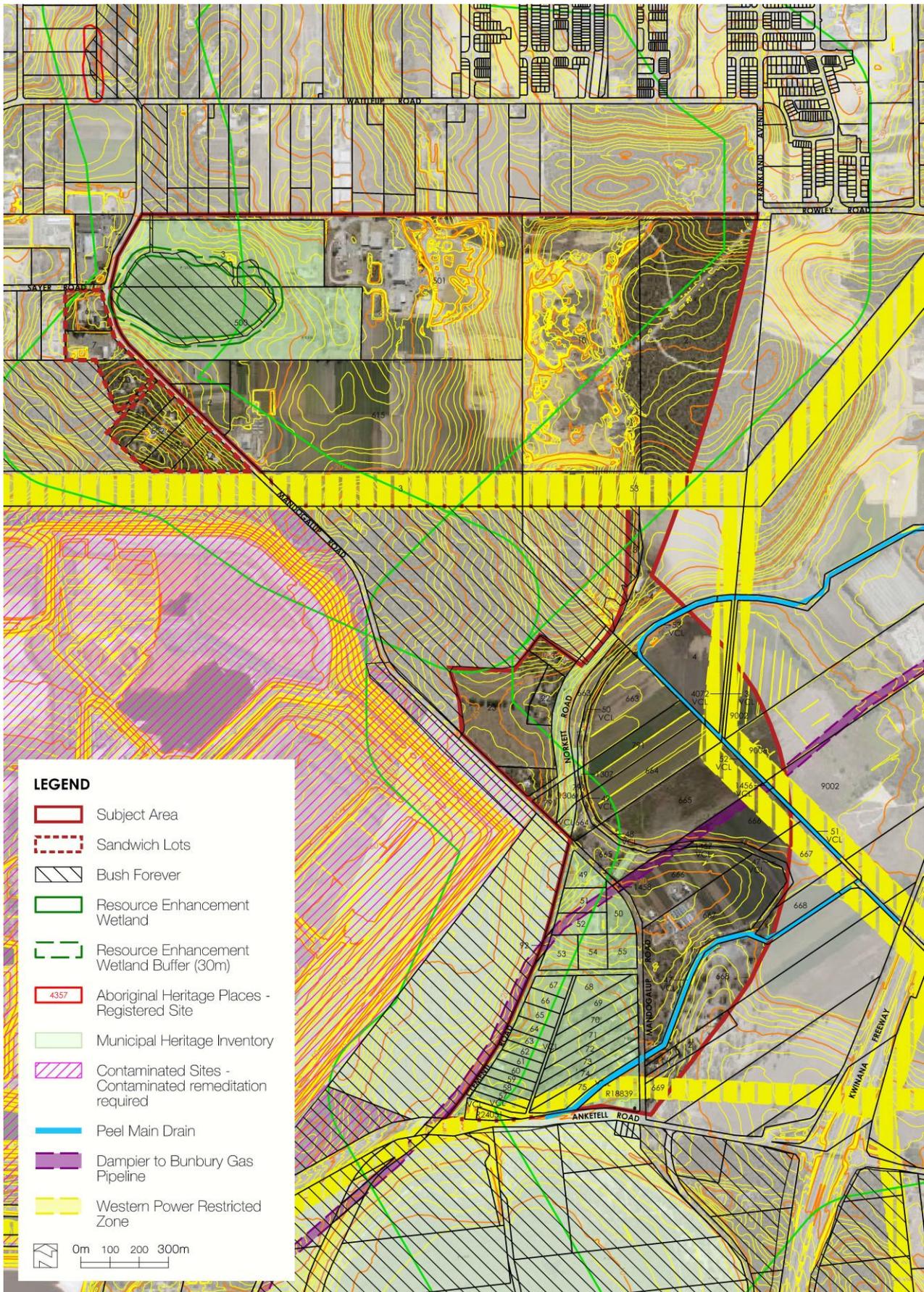


Figure 2: Subject Area Features

1.6 Subject Area Context

1.6.1 Locational Context

The subject area is located in Mandogalup, approximately 25 km south of the Perth CBD within the jurisdiction of the City of Kwinana. The subject area is located approximately 7km north east of the Kwinana Town Centre, 8km south of Cockburn Central and 13km north of the Rockingham Town Centre.

The subject area is located to the east of the Kwinana Industrial Area, which comprises a range of industrial land uses.

The Perth to Mandurah rail line is located to the east of the subject area, with the Aubin Grove Train Station located approximately 4km north-east of the subject area, and the Kwinana Train Station located approximately 5km south of the subject area.

The subject area is in proximity to a network of public open space, including the Beelihar Regional Park which is located to the north, south and west of the subject area.

The Hope Valley-Wattleup Redevelopment Scheme Area abuts the north-western edge of the subject area, which extends west to Rockingham Road, and expands from Anketell Road in the south to Fanstone Avenue in the north, comprising approximately 1,400 hectares of land. The land within the Hope Valley-Wattleup Redevelopment Scheme Area is commonly known as 'Latitude 32', and is planned to provide mixed industrial land uses.

Alcoa Australia Limited

Alcoa Australia Limited's (Alcoa) Kwinana Alumina Refinery is located approximately 5km west of the subject area, within the Kwinana Industrial Area. The refinery produces alumina from bauxite. Alcoa's Residue Disposal Area (RDA) is located immediately west of the subject area. The RDA is used to store the material remaining after alumina has been extracted from bauxite ore, which is commonly termed as 'residue', and is pumped to the residue area from the refinery. The residue is composed primarily of iron and silica minerals.

The Western Australian Government has a State Agreement with Alcoa, detailing the rights, obligations, terms and conditions in relation to Alcoa's Kwinana operations (*Alumina Refinery Agreements (Alcoa) Amendment Act 1987*), which amends the *Alumina Refinery Agreement Act 1961* (ARA Act). It is noted that the State Agreement refers to the requirements in relation to residue disposal (clause 6 ARA Act). Of relevance to this project, clause 6 includes the following subclauses, requiring residue discharged not to contain material which will cause a nuisance or be dangerous to public health, and requiring the RDA to support light industry upon completion:

- (8) The Company will ensure that the residue discharged through the pipe or pipes containing the sands will not contain any material which may be or become or cause a nuisance or be or become dangerous or injurious to public health.
- (4) (d) The Company shall use reasonable endeavours to ensure that each portion so filled will support buildings for light industry.

1.6.2 Planning Context

Structure Plans

The Structure Plans immediately surrounding the subject area are detailed in **Table 1**. The Mandogalup West Local Structure Plan (LSP) (prepared on behalf of QUBE Property Group) and the Mandogalup East LSP (prepared on behalf of Satterley) are located immediately east of the subject area to facilitate residential development on land zoned Urban in the MRS (refer **Figure 3**). The LSPs were both approved by the WAPC in March 2018.

The Southern Suburbs District Structure Plan is located north of the subject area to facilitate development in Hammond Park, comprising predominately residential development.

Table 1: Structure Plans surrounding Subject Area

Structure Plan	Location relevant to Subject Area	Land Area Covered by Structure Plan	Estimated Dwelling Yield	Estimated Population
Mandogalup East Local Structure Plan	East of Subject Area	42.67ha	674 dwellings	1887 people @ 2.8 people / household
Mandogalup West Local Structure Plan	East of Subject Area	68.46 ha	900 dwellings	2520 @ 2.8 people / household
Southern Suburbs District Structure Plan	North of Subject Area	234 ha	3411 dwellings	9550 @ 2.8 people / household

Westport

In 2020, the Western Australian Government announced that Western Australia’s future container port will be built in Kwinana to meet Western Australia’s long-term freight needs for the next 50 years and beyond (refer **Figure 3**). The port will be built in the Kwinana Industrial Area, and will include upgrading Anketell Road into a freight route that will connect the port directly to Tonkin Highway and the logistics precincts in the outer Perth metropolitan area. It will also be supported by an enhanced rail network and new intermodal terminals.

The Western Australian Government are currently working to determine the timetable of transitioning freight from the Fremantle Port to Kwinana, with the transition anticipated to occur either in one step by 2032, or over a phased period that will see both ports share the freight task for around a further 15 years.

The Land Use Scenarios prepared over the subject area will be required to be updated to reflect Westport’s design of Anketell Road, once this has been finalised.

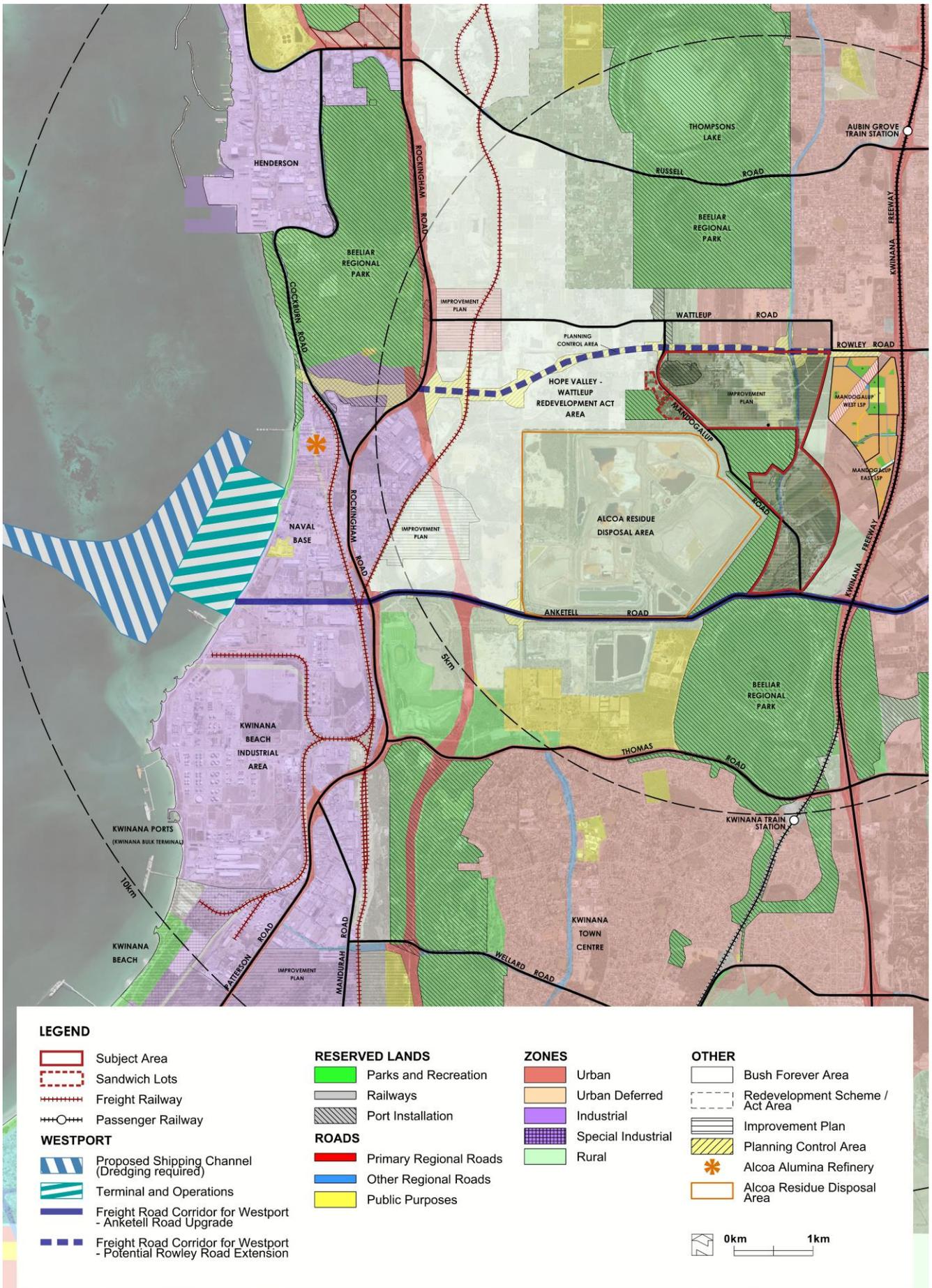


Figure 3: Subject Area Context - District

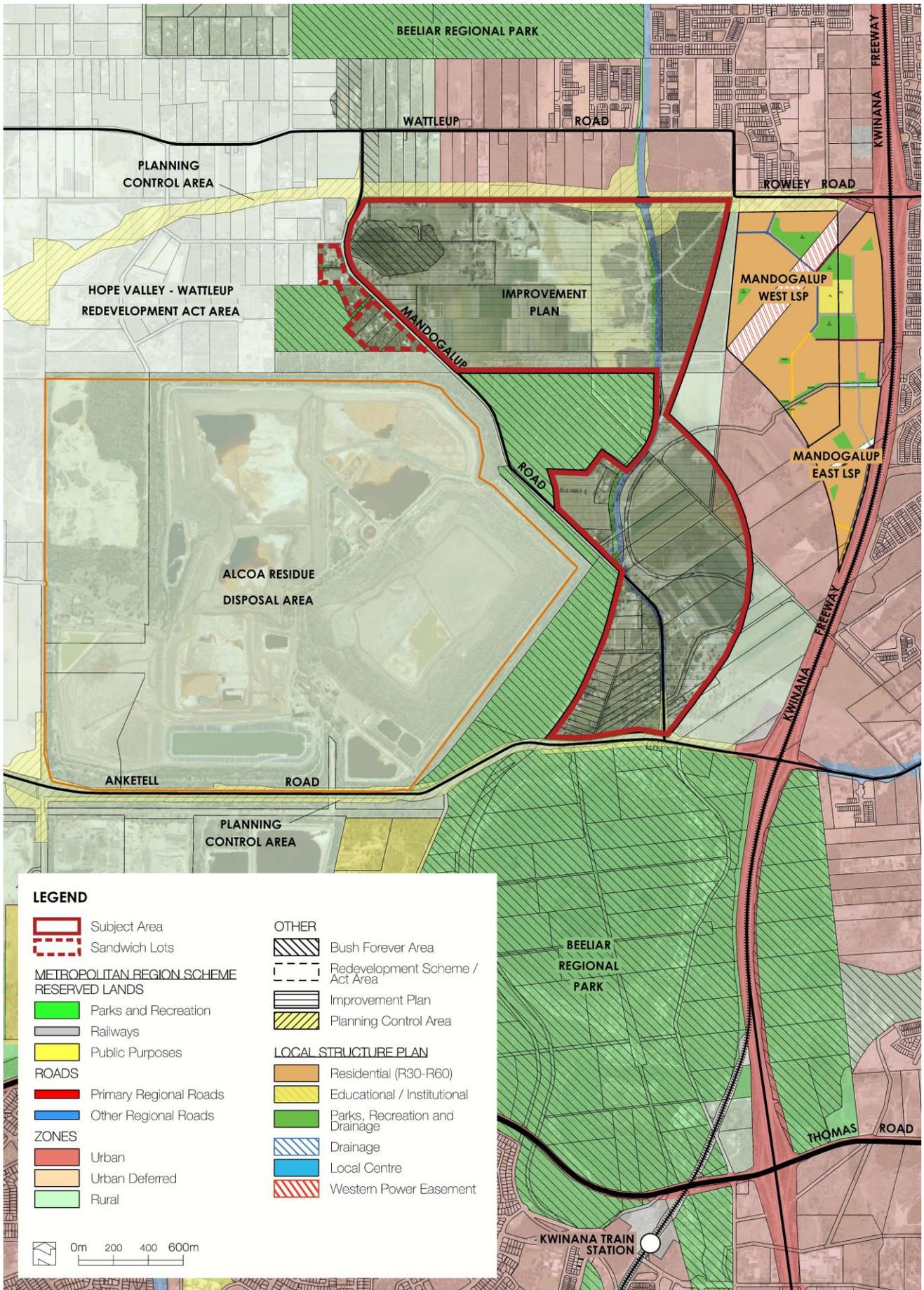


Figure 4: Subject Area Context - Local

2.0 State and Regional Planning Context and History

2.1 Metropolitan Region Scheme

The subject area is predominantly zoned Rural under the Metropolitan Region Scheme (MRS). A small portion of the subject area (5.1744 ha) in the eastern corner is zoned Urban Deferred (refer **Figure 5**).

The land along the northern boundary of the subject area, including a portion of the subject area, is included in Planning Control Area No. 112, which was established to protect land for the future extension of Rowley Road. Similarly, land along the southern boundary of the subject area is included within Planning Control Area No. 111, to protect land to accommodate the widening of Anketell Road.

The land to the immediate north of the future Rowley Road extension comprises land zoned Rural and Urban. To the east of the subject area, there is a strip of Rural zoned land next to an area of Urban zoned land which abuts the Kwinana Freeway. To the south of Anketell Road, the land is reserved Parks and Recreation and forms part of Bush Forever site 269. To the west of the subject area the land is predominantly reserved for Parks and Recreation and included in Bush Forever site 268. The subject area also abuts the Hope-Valley Wattleup Redevelopment Scheme area along the north-western boundary. There is also a portion of land to the west of the subject area zoned Rural, including the sandwich lots and Alcoa's RDA.

2.1.1 MRS Amendments History

The Urban zoned land east of the subject area has been subject to the several MRS Amendments as outlined below and summarised in **Table 2**.

MRS amendment 1114/33 was initiated in June 2006 to rezone approximately 352ha of land in Mandogalup from Rural to Urban Deferred. The amendment was recommended for final approval by the WAPC, but held in abeyance following objections from Alcoa regarding potential dust impacts. The 'Review of the Kwinana Air Quality Buffer – Position Paper' (WAPC, 2008) identified an area 1km from the nearest residue disposal area as "subject to further investigation", due to potential impacts of dust, noise and visual amenity arising from the operation of the residue storage area. Amendment 1114/33 was subsequently approved in November 2009, in a reduced form, transferring approximately 181ha (out of the 352ha) outside the 1km buffer to the Urban Deferred zone.

In the Minister's decision to reduce the amendment area, the Minister made the following direction under Section 17 of the *Planning and Development Act 2005 (PD Act)*:

No decision to transfer land in the Mandogalup locality from the Rural or Urban Deferred zones to the Urban zone in the Metropolitan Region Scheme shall be made without the prior approval of State Cabinet and the Minister at the time responsible for the Metropolitan Region Scheme and amendments to it. Further, no such decision will be made until the Kwinana Air Quality Buffer (or whatever title said buffer may come to be known as) has been finalised clearly indicating what land is outside a buffer area and therefore could appropriately be transferred to the Urban zone, subject to whatever other planning circumstances may apply to the locality at the time.

A revised Kwinana Industrial (including air quality) Buffer was subsequently prepared in 2010 and published in 2011. In May 2011, QUBE Property Group and Satterley lodged an application to lift the Urban Deferred zone over the portion of land outside of the Kwinana Industrial Buffer, which was approved and included in the Urban Zone on 18 March 2014.

Additional land east of the subject area was subject to an Urban Deferred Lifting, which was gazetted 12 April 2019, which was informed by the EPA advice to the Minister for Environment titled "Consideration of potential health and amenity impacts of dust in determining the size of a buffer for urban development in the Mandogalup area" (June 2017).

Table 2: Contextual MRS Amendments

MRS Amendment	Amendment Request	Gazettal Date	Notes
1114/33	Rural to Urban Deferred	November 2009	<ul style="list-style-type: none"> Reduced area (181 ha out of 352 ha requested) transferred to Urban following objections from Alcoa regarding potential dust impacts, and the WAPC's subsequent release of the Review of the Kwinana Air Quality Buffer – Position Paper in 2008. Minister decides no further MRS Amendments to Urban Deferred or Urban zones until Kwinana Air Quality Buffer has been finalised and indicates land not impacted by buffer.
1260/27	Lifting of Urban Deferred	March 2014	<ul style="list-style-type: none"> Informed by the Kwinana Industrial (including air quality) Buffer which was prepared in 2010 and published in 2011
1350/27	Lifting of Urban Deferred	April 2019	<ul style="list-style-type: none"> Informed by the EPA advice to the Minister for Environment titled "Consideration of potential health and amenity impacts of dust in determining the size of a buffer for urban development in the Mandogalup area" (June 2017).

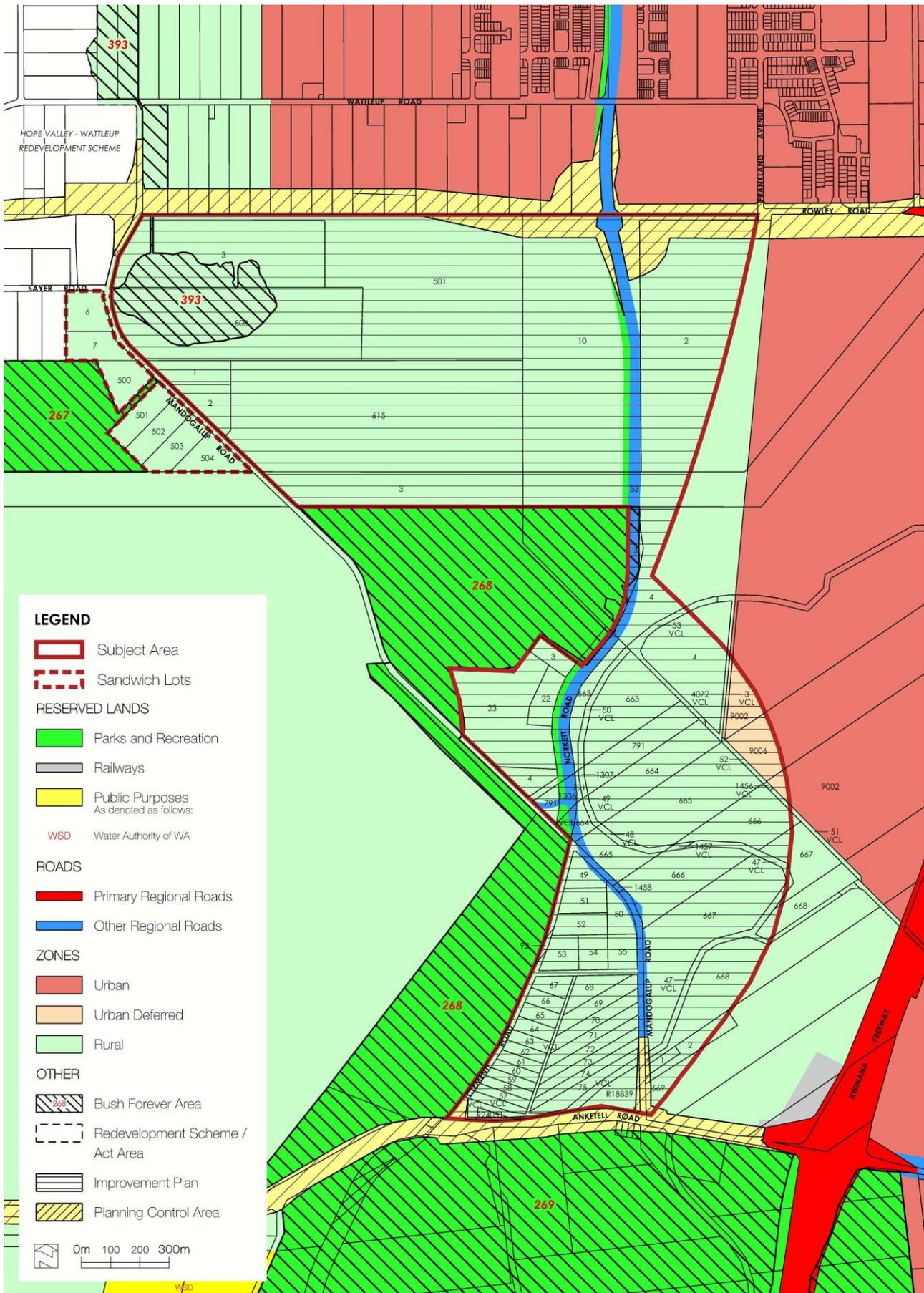


Figure 5: Metropolitan Region Scheme Extract

2.2 Hope Valley-Wattleup Redevelopment Act 2000

Land west of the site is included within the Hope Valley-Wattleup Redevelopment Area, which is governed by the Hope Valley-Wattleup Redevelopment Scheme. The Act provides Development WA with the functions to plan, undertake, promote and coordinate the development and redevelopment of land in the redevelopment area. The MRS and local planning schemes do not apply to the redevelopment area.

2.3 Improvement Plan No. 47

The extent of the subject area is defined by Improvement Plan No. 47, which was gazetted on 12 April 2019 (refer **Figure 6**). The purpose of Improvement Plan 47 is to:

- Enable the WAPC to undertake all necessary steps to advance the planning and development within the plan area as provided for under Part 8 of the PD Act;
- Establish the strategic planning and development intent within the subject area;
- Provide for a strategic planning framework endorsed by the WAPC, Minister for Planning and the Governor;
- Authorise the preparation of an improvement scheme;
- Provide the objectives of the improvement scheme; and
- Provide guidance to the preparation of statutory plans, statutory referral documentation and policy instruments.

2.3.1 Objectives

The Improvement Plan sets out the following objectives for guiding the preparation of the Improvement Scheme:

- To provide for a strategic land use analysis that takes into consideration physical, economic and environment factors;
- To provide a strategic planning framework to determine future land use considering all land use options (rural, urban and/or industrial);
- To provide a statutory planning instrument through which to implement the strategic planning framework;
- To provide a statutory land use planning instrument to effectively guide the preparation of statutory plans, statutory referral documentation and policy (as may be required) to facilitate orderly and proper planning of the area; and
- To facilitate the provision of an effective, efficient, integrated and safe transport network.

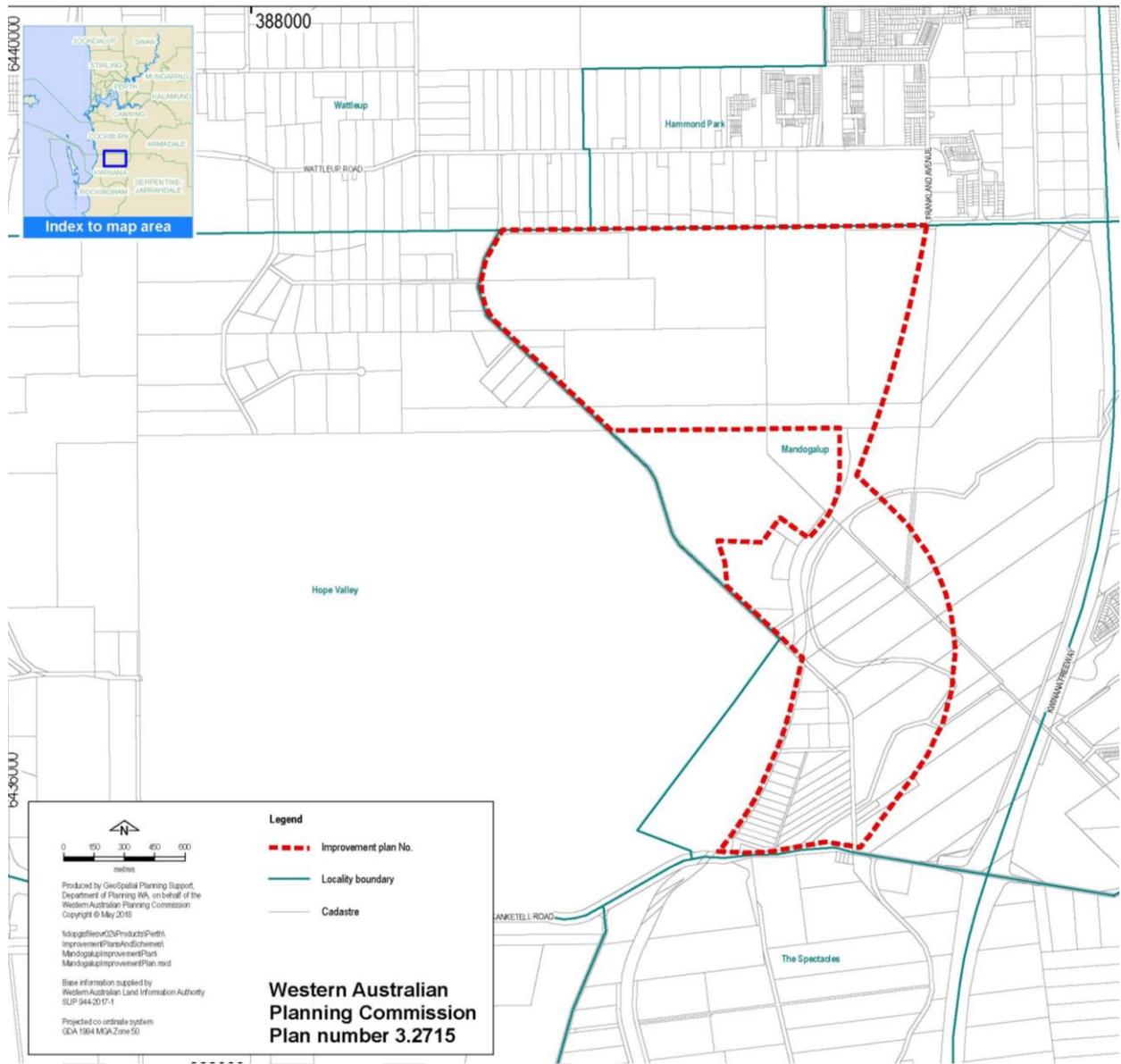


Figure 6: Improvement Plan No. 47 (Source: WAPC)

2.4 Perth and Peel @ 3.5 Million (WAPC, 2018)

Perth and Peel @3.5million is a high-level suite of strategic documents published by the WAPC, for the Perth and Peel metropolitan regions to identify:

- Where future homes and jobs should be located;
- How to protect important environmental assets;
- How to best utilise existing and proposed infrastructure; and
- Appropriate areas for greater infill development and residential density.

2.4.1 South Metropolitan Peel Sub-Regional Planning Framework

As part of Perth and Peel @3.5million, sub-regional planning frameworks were released in March 2018 to guide future development. The sub-regional planning frameworks guide the WAPC in the zoning of new Urban and Industrial land. The Jandakot District Structure Plan (refer **Section 2.6**) and Eastern Residential Intensification Concept (refer **Section 3.3**) were taken into account when the Frameworks were prepared and although needs some level of consideration, are superseded by the frameworks, particularly where there are inconsistencies with new Urban or Industrial zones.

The subject area is included within the South Metropolitan Peel Sub-Regional Planning Framework (SRPF), which will contribute to 36% of Perth and Peel's population by 2050, bringing the south metropolitan sub-region's population close to 1,264,450 people. The City of Kwinana has been identified within the central sub-region to accommodate an additional 1,370 dwellings. This growth is to be achieved through a combination of infill and greenfield development and presumes that all 'Urban' zoned land within the central sub-region is made available to accommodate this objective.

In terms of industrial land demand, the SRPF identifies there is a total demand of 5,920 hectares within the sub-region beyond 2031.

The subject area is identified as Industrial Investigation in the SRPF. Industrial Investigation areas require further detailed planning to be undertaken prior to consideration for rezoning under the MRS. The classification of these areas is not to be construed as a commitment by the WAPC to support any rezoning, as this will depend upon the outcome of further detailed planning investigations.

The sandwich lots are identified as Industrial Expansion in the SRPF.

The land east of the subject area is identified as Urban Expansion and Urban in the SRPF.

West of the subject area, a strip of land is identified as Open Space, and Alcoa's land is identified as Industrial in the SRPF.

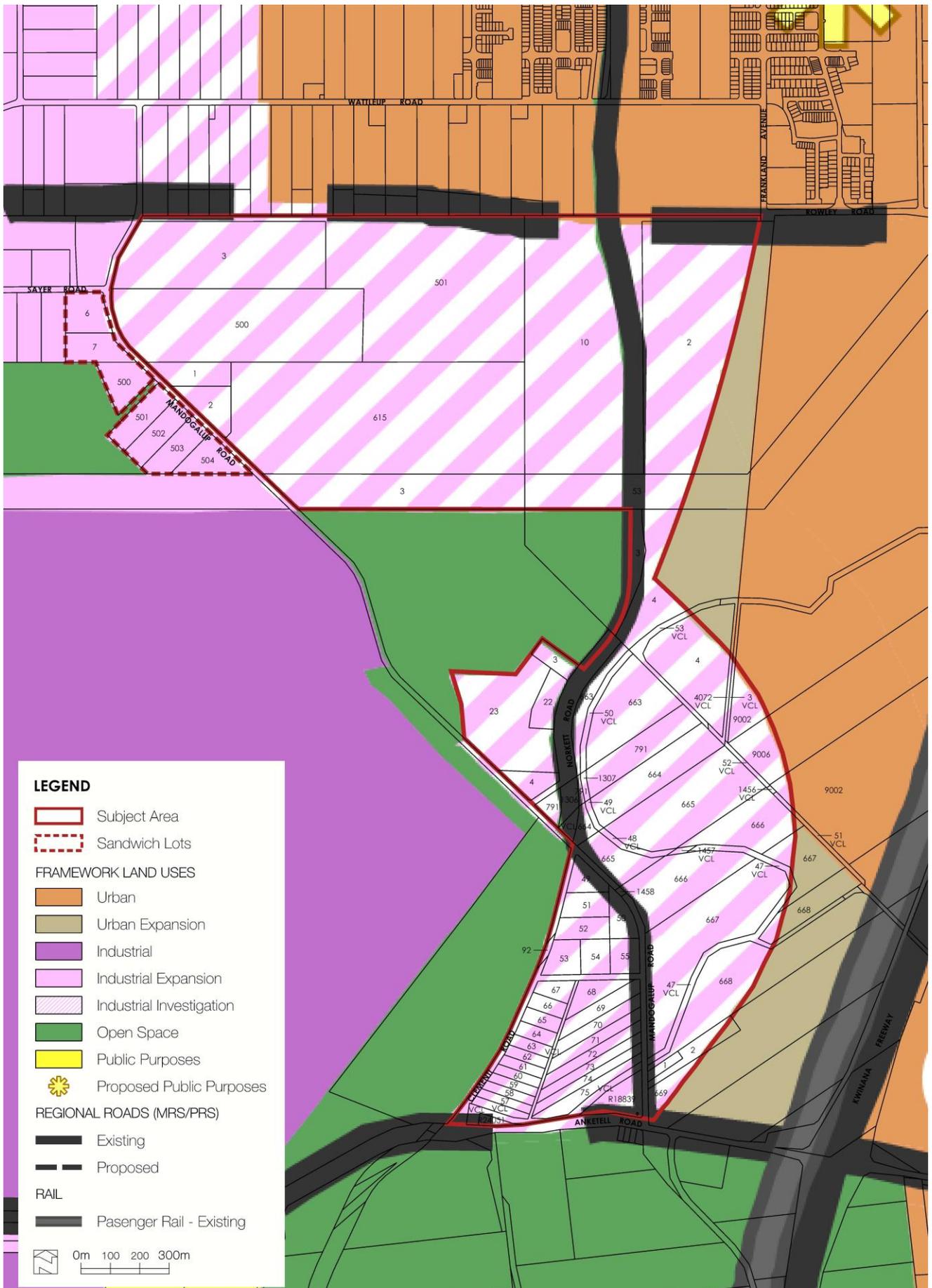


Figure 7: South Metropolitan Peel Sub-Regional Planning Framework Extract

2.5 Perth And Peel @ 3.5 Million – The Transport Network (WAPC, 2018)

The release of the Perth and Peel @ 3.5 million provided the structure to prepare a strategic transport network plan, referred to as Transport @ 3.5 million. The plan addresses:

- Public transport rail network;
- Public transport and on-road network;
- Cycling network;
- Freeway network; and
- Freight network.

Transport @ 3.5 million identifies the proposed extensions of Rowley Road and Anketell Road east to the Kwinana Industrial Area, and upgraded to primary distributors. Rowley Road and Anketell Road are also identified as forming part of the Primary Freight network, providing access to the Kwinana Port (subject to Westport freight investigations).

Accordingly, consideration will need to be given to the implications of freight traffic utilising these roads, particularly in relation to access and noise.

2.6 Jandakot District Structure Plan (WAPC, 2007)

The Jandakot District Structure Plan (JDSP) was adopted by the WAPC in 2007, and identifies the physical framework for the future development of the land immediately surrounding the Jandakot Underground Water Pollution Control Area, generally comprising the locality of Oakford, Mandogalup, Casuarina, Wellard, Anketell and The Spectacles.

The majority of the subject area is identified as Long – Term Urban, with a local centre identified in the northern portion of the subject area (refer **Figure 8**). Two Primary Schools are identified along the eastern edge of the subject area. Pockets of the subject area are identified as Rural and Open Space.

The majority of the subject area is also located within the 1km Alcoa Bauxite Residue Storage Buffer area, with a portion included within the Kwinana Air Pollution Area B Boundary.

The JDSP acknowledges that the buffer area for the Alcoa residue area poses a significant constraint to the potential for land use change, and is subject to further consideration in the coming years and may vary from the 1km at a future date, thus affecting the extent of any urban zone. In areas impact by the buffer, urban development should be deferred until the buffer is no longer required due to change to the storage area and / or scientific review supports buffer reduction.

A railway station was indicated south of the subject area on the corner of the Kwinana Freeway and Anketell Road.

The JDSP states that the Mandogalup area has long-term potential as an area that can support a more sustainable transit-oriented development, which would be subject to further consideration of train station locations being undertaken.

Although the sandwich lots are excluded from the JDSP Study Boundary, the 1km Alcoa Bauxite Residue Disposal Area Buffer also falls across the northern portion of these lots.

The JDSP is now superseded by the SRPF, although some level of consideration should still be given to the document.

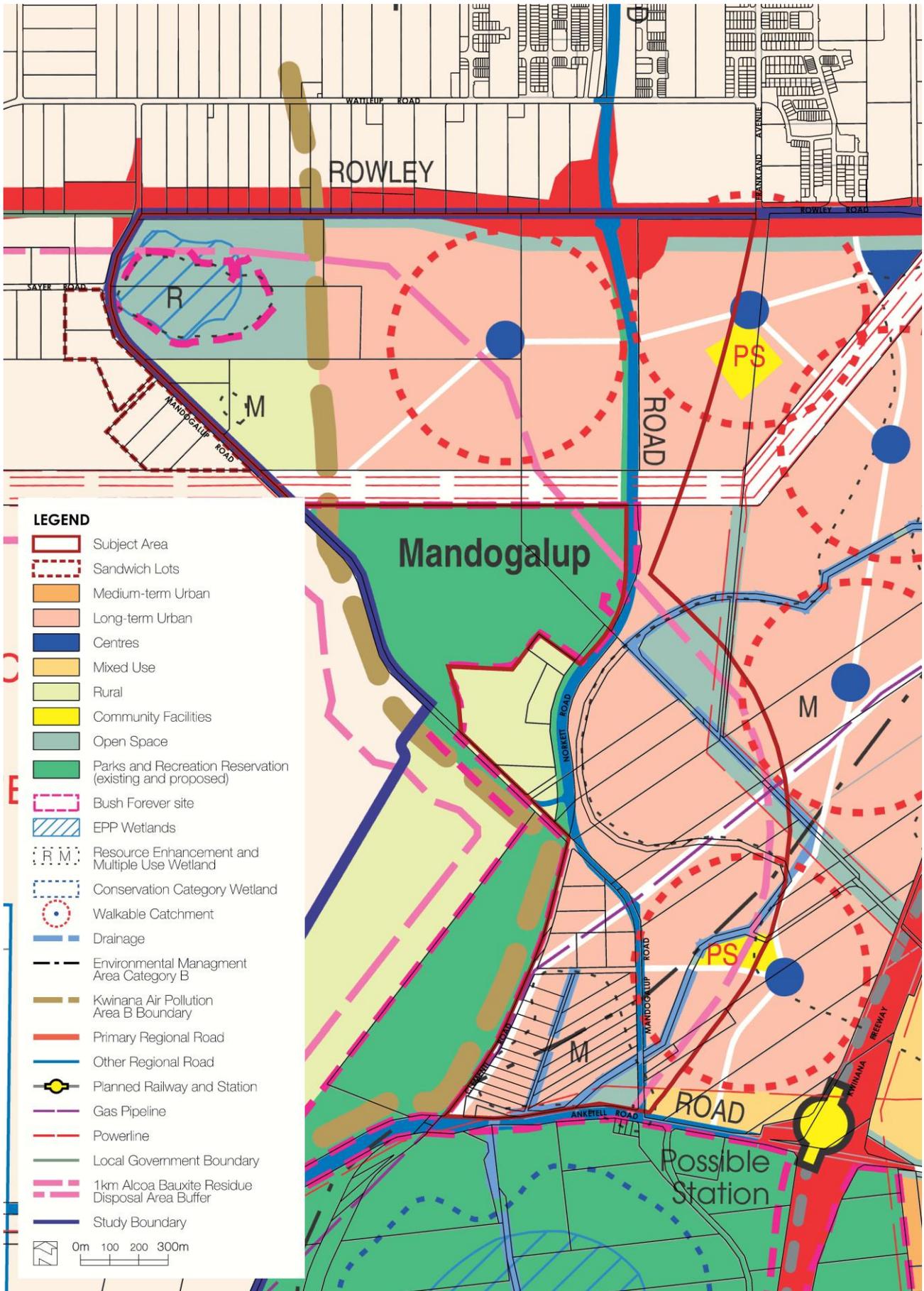


Figure 8: Jandakot District Structure Plan Extract

2.7 Fremantle to Rockingham Industrial Area Regional Strategy (WAPC, 2000)

The Fremantle to Rockingham Industrial Area Regional Strategy (FRIARS) was prepared by the WAPC to enable Government to provide strategic land use planning directions for the Fremantle-Rockingham region from the year 2000 for a period of 20-25 years.

The Strategy includes a Preferred Land Use Strategy, which is focused on land west of the subject area, to the west of Abercrombie Road, which is identified primarily for general and light industrial uses.

The Preferred Land Use Strategy identifies that Alcoa will continue to operate the mudlakes (adjacent to the subject area) for some time into the future. The Strategy also recommends reviewing the buffer requirements for the Alcoa residue storage areas, to inform and identify future uses at Mandogalup.

2.8 State Planning Policies

State Planning Policy 2 Environment and Natural Resources

State Planning Policy 2 Environment and Natural Resources (SPP 2) defines the principles and considerations that represent good and responsible planning in terms of environment and natural resource issues. The objectives of the policy are to:

- Integrate environment and natural resource management with broader land use planning and decision-making;
- Protect, conserve and enhance the natural environment; and
- Promote and assist in the wise and sustainable use and management of natural resources.

Key Considerations

Consideration has been given to SPP 2 through the preparation of the Environmental Assessment Report included in Appendix A and discussed in Section 5.2, which assesses the natural environment of the subject area, and has been used to inform the land use scenarios. Additionally, consideration will be given to the impact of the adjacent industrial land uses on the subject area, as discussed in **Section 5.3**.

State Planning Policy 2.1 Peel-Harvey Coastal Plain Catchment

State Planning Policy 2.1 Peel Harvey Coastal Plain Catchment (SPP 2.1) ensures that land use changes within the Peel-Harvey estuarine system likely to cause environmental damage to the estuary are brought under planning control and prevented. A DWMS has been prepared for the subject area (**Appendix B**). The key principles and objectives of the DWMS have been informed by *Water Quality Improvement Plan for the Rivers and Estuary of the Peel-Harvey System- Phosphorus Management* (EPA, 2008), which is an implementation of SPP 2.1. Furthermore, a LWMS will be prepared at the Structure Planning phase, in accordance with the requirements of SPP 2.1.

State Planning Policy 3 Urban Growth and Settlement

State Planning Policy No. 3 Urban Growth and Settlement (SPP 3) establishes the broad principles and considerations which apply to planning for urban growth and settlements in Western Australia. As a result of the undeveloped nature of the land, SPP 3 is required to be taken into consideration as part of future land use scenarios for the subject area.

Key Considerations

In particular, the following policy objectives should be considered:

- To promote a sustainable and well planned pattern of settlement across the State, with sufficient and suitable land to provide for a wide variety of housing, employment, recreation facilities and open space;
- To build on existing communities with established local and regional economies, concentrate investment in the improvement of services and infrastructure and enhance the quality of life in those communities;
- To manage the growth and development of urban areas in response to the social and economic needs of the community and in recognition of relevant climatic, environmental, heritage and community values and constraints;
- To promote the development of a sustainable and liveable neighbourhood form which reduces energy, water and travel demand whilst ensuring safe and convenient access to employment and services by all modes, provides choice and affordability of housing and creates an identifiable sense of place for each community; and
- To coordinate new development with the efficient, economic and timely provision of infrastructure and services.

State Planning Policy 3.6 Development Contributions for Infrastructure

State Planning Policy 3.6 – Development Contributions for Infrastructure (SPP 3.6) sets out the principles and considerations that apply to development contributions for the provision of infrastructure in new and established urban areas, and the form, content and process to be followed for establishing DCPs.

Key Considerations

Consideration will be given to the requirement for development contributions during the preparation of the Improvement Scheme.

State Planning Policy 3.7 Planning for Bushfire Risk Management

SPP 3.7 assists in reducing the risk of bushfire to people, property, and infrastructure by encouraging a conservative approach to strategic planning, subdivision, development, and other planning decisions proposed in bushfire-prone areas. Specifically, it:

- Elevates bushfire issues to be addressed by the highest level of planning policy available, giving it clear status and effect in the land use planning policy framework;
- Emphasises the need to consider bushfire management measures in strategic level policy documents, including Regional and Local Planning Schemes, Sub-regional and Local Planning Strategies and Structure Plans, as well as during statutory planning processes for subdivision and development applications; and
- Seeks to achieve the consistent implementation of bushfire management measures across the community.

SPP 3.7 applies to all land which has been designated as bushfire prone by the Fire and Emergency Services (FES) Commissioner as identified on the Map of Bush Fire Prone Areas. The majority of the subject area is identified as bushfire prone on the Map of Bush Fire Prone Areas with the exception of a portion of the sand quarry in the northern end of the subject area which has been cleared. The designation of the area as bushfire prone highlights the potential for bushfire to affect the subject area and is a trigger for further assessment to occur.

Guidelines for Planning in Bushfire Prone Areas have also been prepared and are designed to supplement the objectives and policy measures established in SPP 3.7, to assist in their interpretation and provide advice on how bushfire risk is to be addressed when designing or assessing a proposal within a bushfire-prone area.

Key Considerations

Policy Measure 6.3 of SPP 3.7 requires the preparation of a Bushfire Hazard Level (BHL) assessment to be prepared to determine the applicable hazard level(s) across the subject land, in accordance with the methodology set out in the Guidelines. Identification of any bushfire hazard issues arising from the BHL are also to be provided, along with an assessment against the bushfire protection criteria for the Guidelines. This information is provided in the Bushfire Management Plan included in **Appendix C**.

State Planning Policy 4.1 State Industrial Buffer

State Planning Policy 4.1 State Industrial Buffer (SPP 4.1) provides for the protection and long-term security of industrial zones, and also provides for the safety and amenity of surrounding land uses, while having regards to the rights of landowners, who may be affected by residual emissions and risk.

The objectives of this policy are to:

- Provide a consistent statewide approach for the definition and securing of buffer areas around industry, infrastructure and some special uses;
- Protect industry, infrastructure and special uses from the encroachment of incompatible land uses;
- Provide for the safety and amenity of land uses surrounding industry, infrastructure and special uses; and
- Recognise the interests of existing landowners within buffer areas who may be affected by residual emissions and risks, as well as the interests, needs and economic benefits of existing industry and infrastructure which may be affected by encroaching incompatible land uses.

The WAPC is seeking to replace SPP 4.1 with a revised policy referred to as SPP 4.1 Industrial Interface, which is currently in a draft form.

Key Considerations

The subject area is located adjacent to Industrial zoned land, and has been the subject of various air quality buffer investigations and reviews, discussed in **Section 2.10**.

Draft State Planning Policy 4.1 Industrial Interface

Draft SPP 4.1 was released by the WAPC in November 2017. The draft policy deals more generally with providing transitioning compatible zones, reserves and land uses between industry and sensitive land uses to avoid potential conflict.

The policy measures include:

- a) Statutory buffers should be provided around strategic subject areas and facilities of State significance with off-subject area impacts to prevent encroachment by incompatible land uses;
- b) Industries which generate off-subject area impacts should be located in a Strategic or General Industry zones and ensure that off-subject area impacts can be contained within the industrial land use zone or surrounding compatible land use zones and/or reserves; and
- c) A compatible interface should be provided between Strategic/General Industry zones and sensitive zones.

State Planning Policy 4.2 Activity Centres Policy for Perth and Peel

State Planning Policy 4.2 Activity Centres Policy for Perth and Peel (SPP 4.2) established an activity centre hierarchy to meet different levels of community need and enable employment, goods and services to be accessed efficiently and equitably by the community.

Key Considerations

A review of the supply of activity centres surrounding the subject area was undertaken by Pracsys in the Land Supply and Demand Analysis, included in Appendix E, and discussed in **Section 5.11**.

State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning

State Planning Policy Road and Rail Transport Noise and Freight Considerations in Land Use Planning (SPP 5.4) seeks to minimise the adverse impact of transport noise, without placing unreasonable restrictions on noise-sensitive residential development. This Policy is applied where the proposal includes:

- A proposed new noise-sensitive development in the vicinity of an existing or future major road, rail or freight handling facility;
- A proposed new major road or rail infrastructure project in the vicinity of existing or future noise-sensitive land uses;
- A proposed major redevelopment of existing major road or rail infrastructure in the vicinity of existing or future noise-sensitive land uses; or
- A proposed new freight handling facility.

Key Considerations

Schedule 3 of SPP 5.4 identifies both Anketell Road and the Kwinana Freeway as strategic freight and/or major traffic routes, as well as the future Rowley Road. As such the designation of these roads will be considered in the land use scenarios for the subject area, and acoustic assessments will be completed where any noise-sensitive development is proposed in proximity to these traffic routes.

State Planning Policy 7 Design of the Built Environment

State Planning Policy 7 (SPP 7) sets out the objectives, measures, principles and processes which apply to the design and assessment of built environment proposals through the planning system.

Key Considerations

The provisions of SPP 7 should inform any built form guidance prepared for the subject area, including the Improvement Scheme.

2.9 Planning Bulletins

Planning Bulletin 87 – High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region

Planning Bulletin 87 provides guidance on matters to be taken into account in planning in the vicinity of the DBNGP and the Parmelia Pipeline, in the Perth metropolitan region. The purpose of the Planning Bulletin is to:

- Ensure risk to persons and property is at an acceptable level where schemes, scheme amendments, structure plans, land use, subdivision and development are proposed within the vicinity of pipeline corridor/easements;
- Reduce potential risk arising from rupture of the pipeline during adjacent construction works;
- Ensure future schemes, scheme amendments, structure plans, land use, subdivision and development will not encroach on the potential for the existing pipeline corridor/easements to provide the capacity required to meet the long-term demand for natural gas in the south west of Western Australia; and
- Provide a consistent approach for the assessment of the schemes, scheme amendments, structure plans, land use, subdivision and development applications in the vicinity of high-pressure gas pipelines.

The Planning Bulletin identifies required setbacks from the edge of the Damper to Bunbury Natural Gas Pipeline easement, dependent on the type of land use or development. The setback distances are based on the generic quantitative risk assessment undertaken in 2004 by Advantica Worley. The setback distance for the portion of the DBNGP traversing the subject area (DBNGP2 between Muchea and Kwinana) are:

- Sensitive Land uses – 90m
- Residential Land uses – 0m
- Industrial / Commercial Land uses – 0m

Key Considerations

The generic setback distances outlined in the bulletin will be used as a basis for informing the opportunities and constraints mapping. Proposed development within the setback distances will need to demonstrate that the risk from the pipeline is within acceptable levels. Understanding that the landowners of the infrastructure have to accept any future adjacent development, a risk assessment will be completed based on the preferred Land Use Plan to inform any specific setback requirements stipulated within the Improvement Scheme.

2.10 Other Relevant Documentation

There are a series of documents associated with the Kwinana Air Quality Buffer which are of significant importance to this study. This section sets in chronological order from historic to current the key documents, and what the broader implications are for the subject area.

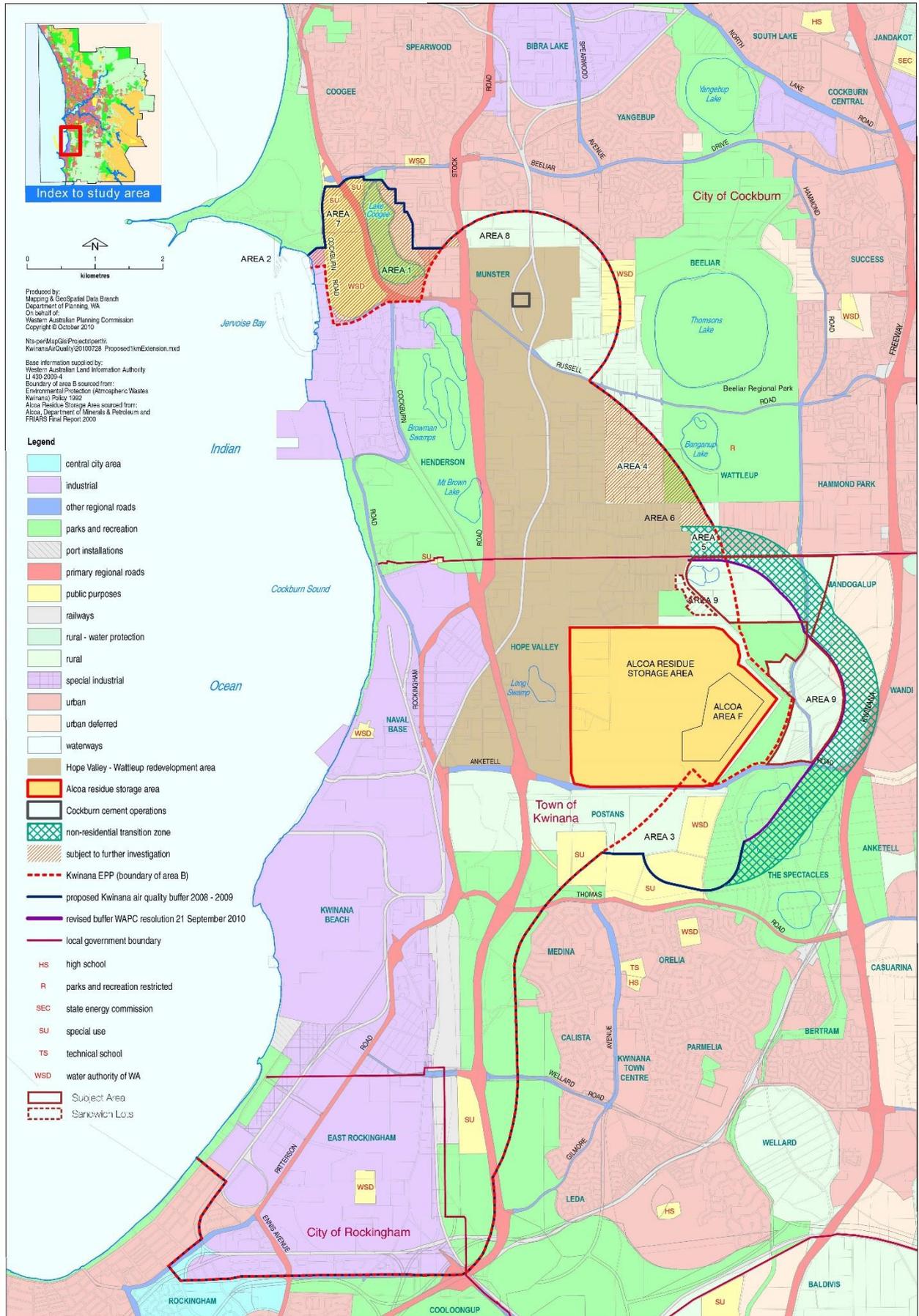
Review of the Kwinana Air Quality Buffer – Position Paper (WAPC, 2008)

The review of the Kwinana Air Quality Buffer Position Paper was released by the WAPC in 2008 to review work previously undertaken in 2002 in relation to the Kwinana Air Quality Buffer, with the aim of finalising the buffer. However, due to a lack of information the Position Paper concluded the buffer was not able to be finalised at the time. The Position Paper proposes an interim buffer to be used to guide land use decisions until the buffer is finalised.

Kwinana Industrial (including Air Quality) Buffer (revised) (WAPC, 2010)

The revised Kwinana Industrial (including Air Quality) Buffer was endorsed by the WAPC in 2010 (refer **Figure 9**). The buffer includes a Kwinana Air Quality Buffer line 1km north, north east and east from the boundary of the Alcoa RDA land holdings as well as an additional 0.5km extension of the 1km buffer as a 'non-residential transition zone'. The 1km buffer and 0.5km 'non-residential transition area zone' are located over the majority of the subject area.

Kwinana industrial (including air quality) buffer



Revised Kwinana industrial (including air quality) buffer, as of 21 September 2010

Figure 9: Revised Kwinana Industrial (including Air Quality) Buffer (Source WAPC, 2010)

Environmental Protection Authority Section 16e Advice (EPA, June 2017)

In 2016, the EPA was requested by the Minister for Environment to provide independent environmental advice concerning the size of the buffer relating to health and amenity impacts of dust now and into the future in respect to potential urban development in the Mandogalup area. The request stemmed from the previous Government's consideration of establishing legislation to control new sensitive land uses in the vicinity of the Kwinana industrial area. The EPA advice has been adopted and is now a position of Government (Cabinet decision). The EPA advice stated, in regards to dust in Mandogalup:

- The potential for dust from Alcoa's RDA is a primary determinant for the size of a buffer required in the Mandogalup area.
- Existing dust control measures limit the frequency and amount of dust currently blown from the RDA.
- Due to the wind pattern in the locality, dust which is blown from the RDA is predominantly blown to the north and north-east of the RDA.
- There is limited potential for dust to be blown to the east of the RDA.
- New technology being installed at the RDA facilities has potential to reduce the amount of dust blown from the RDA subject area in the future.
- Sand and limestone quarrying in the Latitude 32 Industry area and north-western part of Alcoa's RDA property also have significant potential to affect dust levels in the northern Mandogalup area.

The EPA Advice provided the following guidance on potential health and amenity impacts of dust in respect of potential urban development in the Mandogalup Area, with areas B, C & D aligning with the IP47 boundary, and the subject area (refer **Figure 10**):

- **Area A** – Negligible health risk. Low likelihood of amenity impacts
- **Area B** – Health and amenity impacts unlikely, further investigation require.
- **Areas C & D** – Air quality does not appear to meet the NEPM air quality goal. There is also potential for amenity impacts. The likelihood of dust events causing amenity impacts will be reduced. Further investigation of this is required.

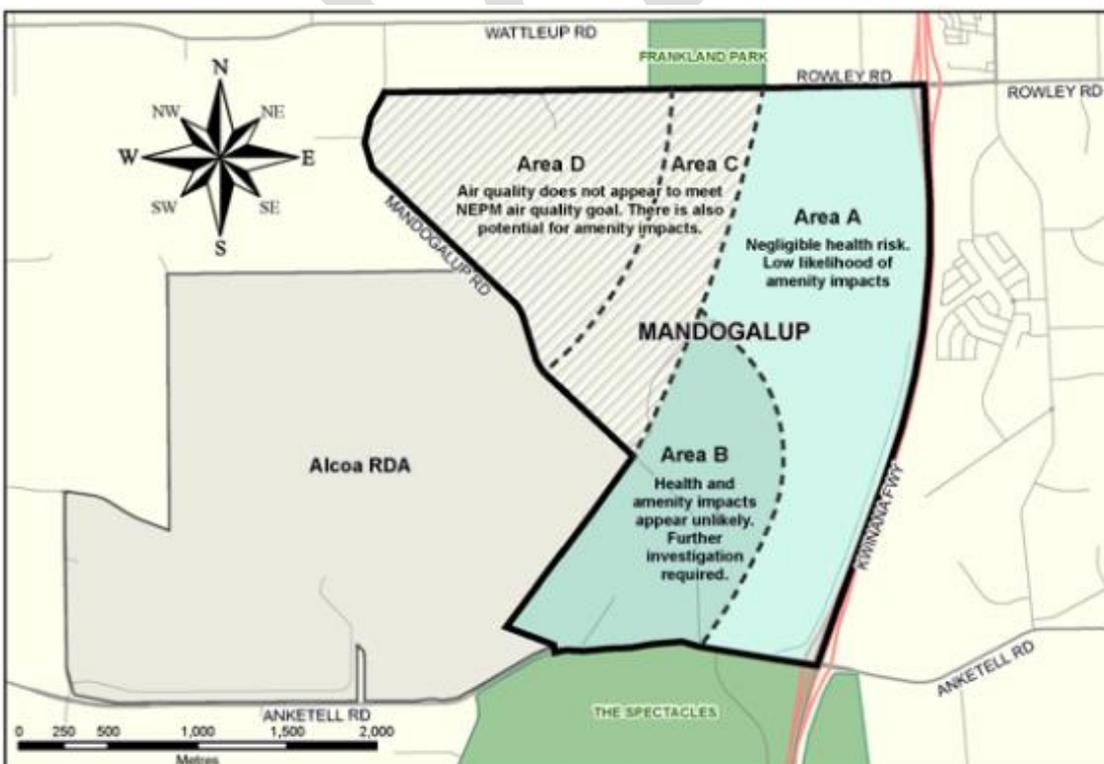


Figure 10: Mandogalup Area Buffer Zone EPA s16e Advice (Source: EPA, 2017)

In response to the 16(e) advice, the Minister for Planning requested the WAPC to commence preparing an improvement plan over rural and urban deferred zoned land to the north, south and east of Alcoa's RDA (Areas, B, C and D). The WAPC subsequently resolved to initiate an Improvement Plan No. 47 and give consideration to all development scenarios as part of the investigations to inform the Improvement Scheme, including rural, urban and industrial.

Mapping dust plumes at Mandogalup using a LiDAR (Department of Water and Environmental Regulation, January 2018)

In addition to the preparation of an Improvement Plan the further investigations identified for Areas B, C and D in the EPA's 16(e) advice, was addressed in a dust monitoring campaign (December 2017 – March 2018) completed by the Department of Water and Environmental Regulation (DWER). The dust monitoring report was published in January 2019, titled "*Mapping dust plumes at Mandogalup using a LiDAR*". Using LiDAR technology to track dust, the objective of the investigation was to determine the origins and movement of dust across areas in the north and north-east of Mandogalup (i.e. Areas B, C and D). The LiDAR Report suggests the majority of the air quality issues could be considered as primarily amenity-related, and also observed that the levels of dust seem to be somewhat compatible to other locations in Perth and semi-rural areas in the wider Perth metropolitan area.

The advice of the EPA and DWER's LiDAR dust monitoring report is the adopted position for the consideration of any dust issues to inform the Improvement Scheme.

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3.0 Local Planning Context

3.1 City of Kwinana Local Planning Scheme No. 2

Zoning

The subject area is zoned predominantly zoned Rural A under the City of Kwinana Local Planning Scheme No. 2 (LPS2) (refer **Figure 11**). A portion of the subject area between Anketell Road and Mandogalup Road is reserved for Public Purposes.

The north-western corner of the subject area is included within Area of Landscape Protection Policy Area 4. Portions of the subject area are also included within Drainage Catchment Management area.

A place of preservation (H8) is located within the southern portion of the subject area on the eastern side of Mandogalup Road, which refers to the Mandogalup Cottage / School House, which has been demolished but remains as a subject area/place of heritage significance.

It is understood that the portion of land east of the subject which is zoned Urban in the MRS, is subject to an application to be rezoned from Rural A to Development in the LPS2, and due to go to Council for initiation early 2020.

Development Contribution Areas

A portion of the subject area is included within Development Contribution Area 6. The Development Contribution Plan for DCA 6 identifies the infrastructure to be funded includes the Hammond Road extension, Public Open Space in accordance with approved structure plans, District Sporting Ground, and a Branch Library (located outside of the subject area).

A portion of the subject area is also included within Development Contribution Area 8. It is understood the City is proposing Scheme Amendment 145, which will remove the subject area from DCA 8.

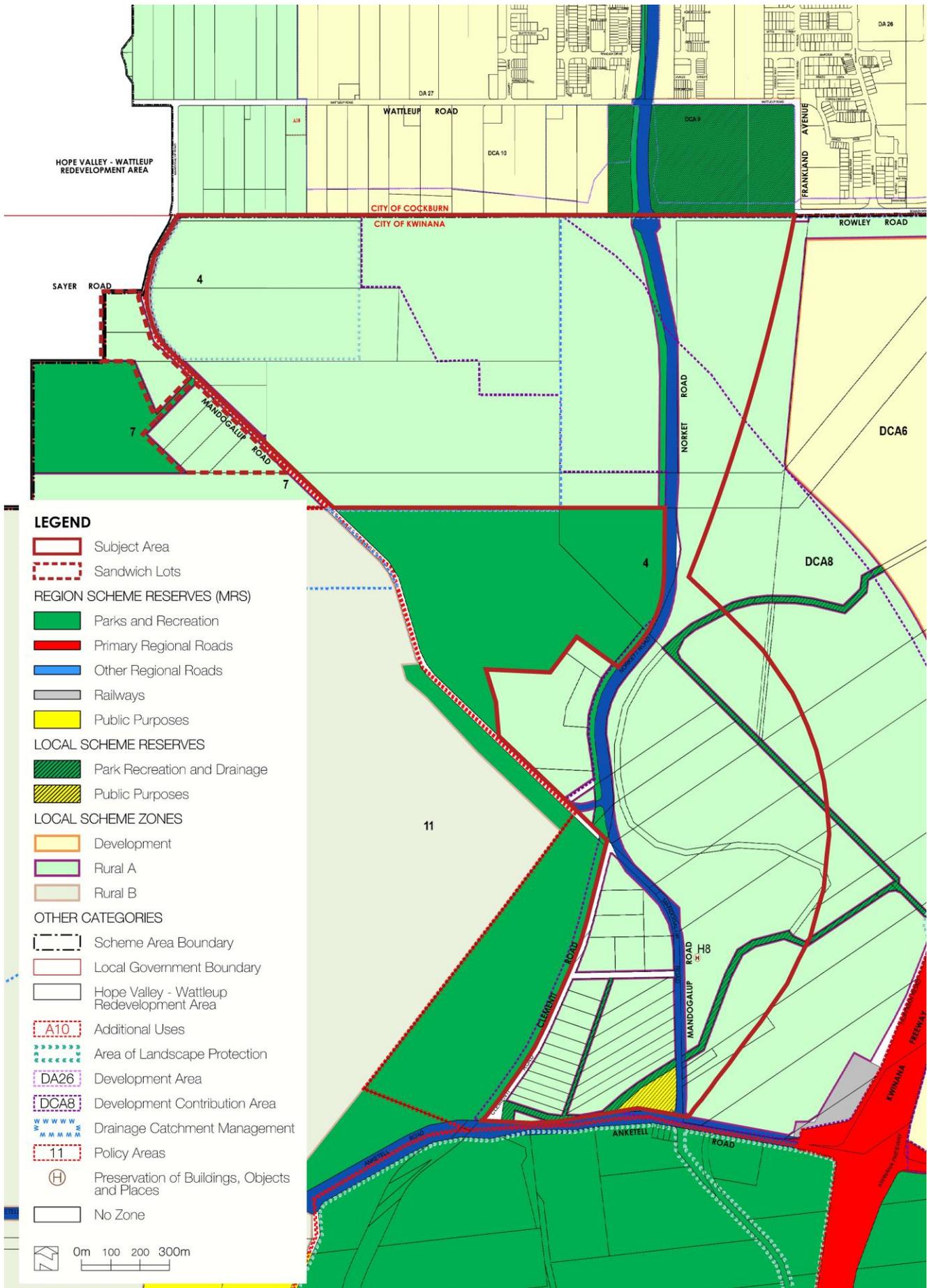


Figure 11: City of Kwinana Local Planning Scheme No. 2 Extract

3.2 City of Kwinana Draft Local Planning Strategy

The City of Kwinana is currently preparing a Local Planning Strategy to provide the City with a sustainable long-term land use planning framework and a blue-print for a new Local Planning Scheme. The Local Planning Strategy is anticipated to be adopted by mid-2023.

City of Kwinana Local Housing Study (City of Kwinana, 2019)

The City of Kwinana Local Housing Study was prepared to assist in understanding the current and future housing needs and strategies required to meet the growing and changing community needs and inform the City's Local Planning Strategy.

The Study identifies that the City has undergone rapid population growth with more than five per cent average growth rate recorded from 2011 to 2016. Strong population growth is forecast over the next two decades, almost doubling to 85,000 by 2036, with an average annual growth rate of 6.45%. This equates to an increase of more than 15,000 households.

The Study indicates that Mandogalup is forecast to accommodate an additional 2,408 dwellings by 2036.

City of Kwinana Local Biodiversity Study (City of Kwinana, 2019)

The City of Kwinana Local Biodiversity Study was prepared to inform the preparation of the City's Local Planning Strategy, and aims to identify the issues associated with the City's biodiversity values and areas and provide guidance to future protection, retention and management.

The Strategy identifies Bush Forever Subject areas within the City, which form much of the remaining natural areas. Of relevance to the subject area, Bush Forever Subject area 393 (Wattleup Lake and adjacent Bushland, Wattleup / Mandogalup) which is located in the north-western corner of the subject area, and is 18.9 ha in area. Bush Forever Subject areas 267 and 268, are located on the western edge of the subject area, and are 16.33 and 99.97 ha in area respectively.

The Strategy identifies the significant biodiversity values within Mandogalup include:

- Banksia Woodland TEC;
- Wetlands; and
- Carnaby Cockatoo / Black Cockatoo Habitat.

The biodiversity values have been considered through the flora and fauna mapping undertaken in the Environmental Assessment Report, and will be considered in the preparation for the Improvement Scheme.

City of Kwinana Integrated Landuse and Transport Study (City of Kwinana, 2019)

The City of Kwinana Integrated Landuse and Transport Study (ILAT) identifies a series of existing and future transport requirements and land use conflicts or compatibilities for the locality across all transport modes, considering the current and projected residential and employee population within the City. The Study makes recommendations to mitigate these conflicts while creating a high-quality integrated planning and transport environment that supports economic, environmental and social activity.

The discussion and recommendations provided throughout the Study are intended to provide the City with the guidance for a 10-year development horizon, and long-term assessment for the potential enabling works for a 2050 scenario.

Of relevance to the subject area, the Study identifies the following:

- The City of Kwinana is proposed to be home to the Outer Harbour, a bulk cargo port with strategic significance to Western Australia. Providing enhanced, efficient transport networks and land use relationships will be vital to facilitate these activities. The Westport Task Force is currently investigating a port-specific freight networks that will largely define the function of strategic corridors across the City;
- Other large-scale industrial developments include Latitude 32, the Postans and Hope Valley Industrial Areas and the IP14 Industrial Park in Rockingham. Given that manufacturing is the largest employment sector in the City, these future development plans are likely to contribute towards a substantial increase in the demand for transport and housing in the adjacent residential zones.
- **Rowley and Anketell Roads** – future growth in residential and industrial traffic is likely to stretch the capacity of the strategic road network, which will be exacerbated by the needs of the Outer Harbour, along with supporting industry outside of the City. Westport is considering the status of a number of east-west road links, which may be reconstructed

as freight corridors. Outcomes regarding the precise orientation of the regional road network are not fully determined. Ultimately, these freight network decisions will result in a greater traffic capacity along certain alignments, and supporting higher private vehicle mode shares than the current network can sustain; and

- **Areas of Conflict** – The sections of Rowley Road and Anketell Road adjacent to the Kwinana Freeway are of particular concern as their intended use conflicts with the future residential land classification.
- Currently Anketell Road acts as a key freight route between Kwinana Freeway and the Kwinana Industrial Area. Future progression on Westport may see the extension of Rowley Road and the upgrade of Anketell Road, both for freight use. It has not yet been confirmed if one or both of these roads is to be used as access routes for Westport.
- The potential function of Anketell and Rowley Roads as key freight corridors could hinder residents' ability to access local roads, schools and public transport. Future infrastructure delivery programs should consider all potential users of these strategic routes, including adequate turning capacity and crossing facilities.
- It is noted the areas of conflict identified in the ILAT assumes a future residential land classification over the subject area.

City of Kwinana Employment and Economic Development Study (City of Kwinana, 2019)

The City of Kwinana Employment and Economic Development Study was prepared by the City of Kwinana to inform the City's new Local Planning Strategy. The Strategy identifies that the most significant economic driver for Kwinana, and the employment site for many of its residents, is its current and potential future industrial estates, including the buffer-protected strategic and heavy industrial land in the Kwinana complex. This land must be regarded as a scarce resource and managed accordingly.

Employment land supply and currently planned future provision is well behind future employment demand, with prospects of declining rates of employment self-sufficiency and self-containment unless all measures are taken to maximise the amount of employment land in the City and to ensure its highest value use.

For heavy and strategic subject areas in the Kwinana Complex, this means discouragement of uses which do not contribute to the network in the complex and which do not require the operational protection afforded by the buffer uses around the complex. This particularly includes activities which are which are large land users but small employers, such as storage, freight and logistics, and large employment uses which could be located elsewhere, such as office / business uses. It also requires strict protection of the buffer from residential encroachment.

The Strategy also identifies the opportunity to capitalise on the access and location advantages of Freeway exposure at sites around the off-ramps at including Rowley Road and Anketell Road. Uses for these sites would fit into a broad service commercial category and might include very large format retail uses, for example, Ikea and direct factory outlets (DFO). Their presence would have no, or minimal effect on existing activity centres, including the City Centre itself.

City of Kwinana Rural Lands Study (City of Kwinana, 2019)

The City of Kwinana Rural Lands Study was prepared to inform the preparation of the City's Local Planning Strategy, and aims to identify the issues associated with the City's rural areas and provide guidance to future planning and land use.

The Study recognises that the subject area is included within Improvement Plan 47, and is subject to future planning to determine the preferred land uses as part of the Improvement Scheme. The Study also identifies that the Council has adopted Local Planning Policy 12 Mandogalup Future Development, which identifies the subject area as Industrial Investigation under the Planning Frameworks, as transitional and light industrial uses.

3.3 Eastern Residential Intensification Concept (City of Kwinana, 2005)

The Eastern Residential Intensification Concept (ERIC) was released by the Town of Kwinana for comment in 2005. It remains a draft as it was never formally adopted by the WAPC. ERIC is considered by the City as an effective strategic plan, used by the City to guide the preparation of and consideration of district and local structure planning, providing an additional layer of detail to the JDSP. The ERIC aims to define the planning framework by which urban subdivision and development can occur in the most coordinated manner, recognising the strategic importance of the land contained within the study area, as acknowledged by the City of Kwinana.

The ERIC denotes a "Modelled Dust Buffer Edge" over a large portion of the subject area, which requires "2 Years of Dust Monitoring by Developers to Validate Model" (refer Figure 13). Within the eastern portion of the subject area, east of Norkett and Mandogalup Roads the subject area is identified predominantly as Residential R20. A strip of land west of the Residential

R20 land is identified as Possible Mid to Long Term Future Residential. Multiple Use Corridor-Infrastructure (Power & Gas Lines) & Ecological Linkages are identified throughout the subject area.

The ERIC also identifies potential freight routes along Anketell and Rowley Roads along the southern and northern edges of the subject area.

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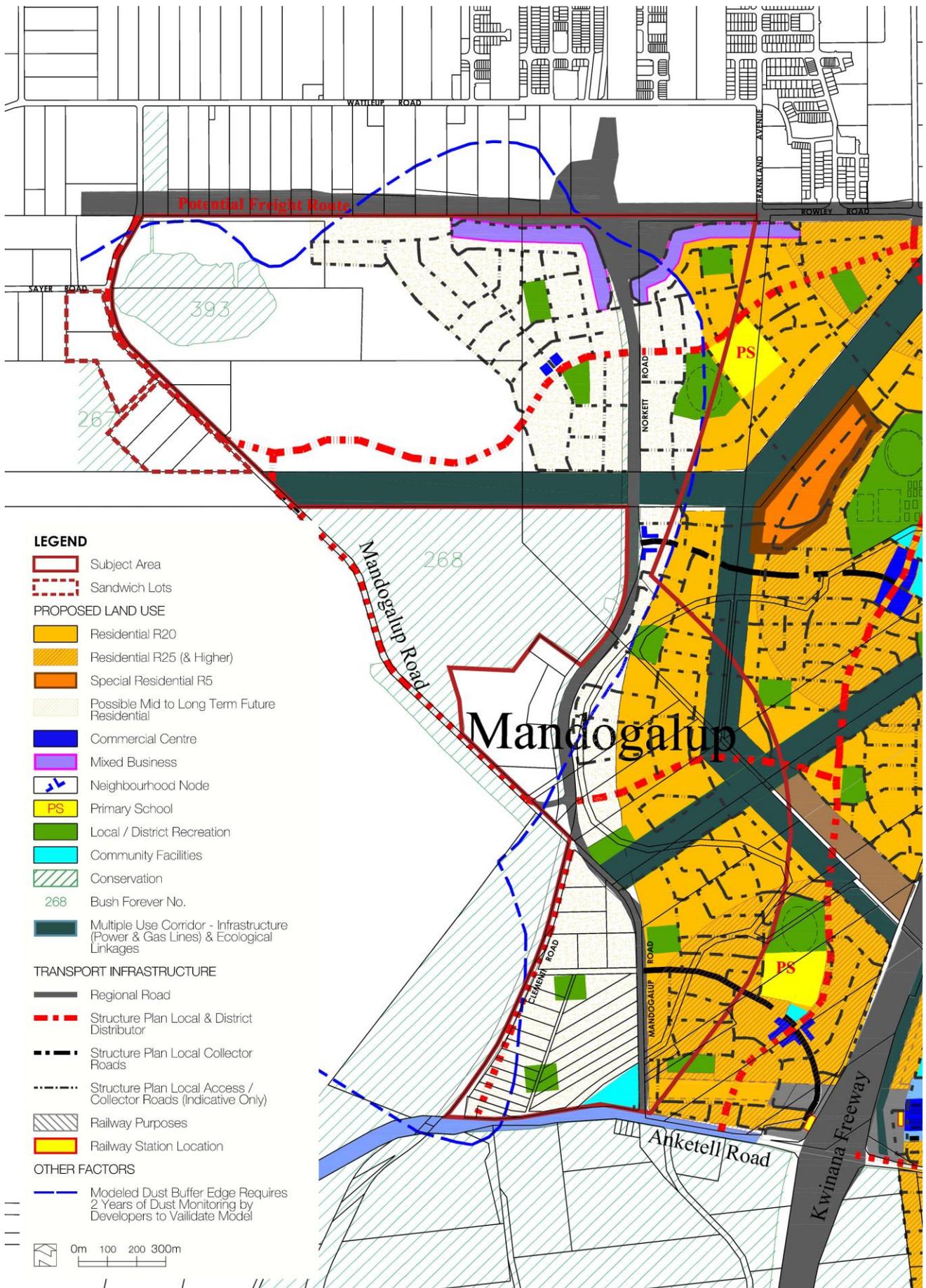


Figure 12: Eastern Residential Intensification Concept

3.4 Mandogalup East Local Structure Plan (Rowe Group, 2017)

The Mandogalup East Local Structure Plan (MELSP) is located east of the subject area, adjacent to the Kwinana Freeway (refer **Figure 13**). The Structure Plan was approved by the WAPC on 26 March 2018. The purpose of the MELSP is to provide a plan for the coordination of future zoning and subdivision of the land to facilitate development for residential purposes. The MELSP comprises predominantly Residential (R20-R60) land, a Primary School on the western edge of the subject area, and a network of Public Open Space. Overall, the MELSP provides for an estimated 674 dwellings, with an estimated population of 1887 people.

3.5 Mandogalup West Local Structure Plan (Roberts Day, 2017)

The Mandogalup West Local Structure Plan (MWLSP) was prepared on behalf of Qube Property Group, and was approved by the WAPC on 22 March 2018 (refer **Figure 14**). The MWLSP is located to the west of the MELSP. The purpose of the MWLSP is to provide a plan for the coordination of future zoning and subdivision of the land to facilitate development for residential, education, recreation and local centre purposes. The MWLSP comprises predominantly Residential (R30-R60) land, a Primary School on the eastern edge of the subject area, a Local Centre and a network of Public Open Space. Overall, the MWLSP provides for an estimated 900 dwellings, with an estimated population of 2520 people.

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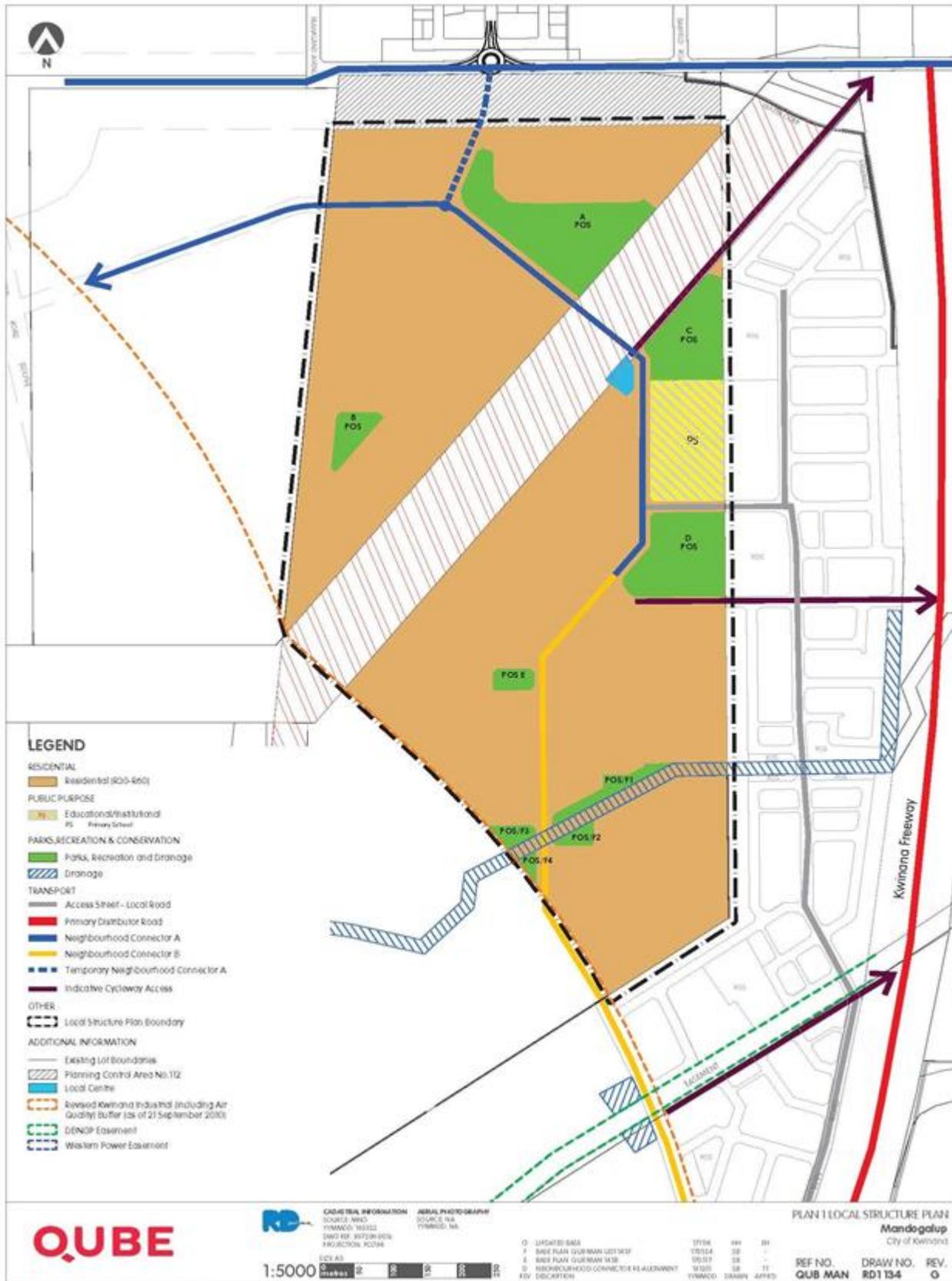


Figure 14: Mandagalup West Local Structure Plan (Source: City of Kwinana, 2017)

3.6 City of Kwinana Community Infrastructure Plan (City of Kwinana, 2010, Revised 2015)

The City of Kwinana Community Infrastructure Plan (CIP) identifies the need for community facilities generated by both existing residents and the future population, resulting from new residential development over the next 20 years. The CIP does not form part of the planning framework, so is not given due regard to in the assessment of planning applications, however does provide guidance on the City's preferences in regards to community infrastructure. The CIP focuses on community facilities provided by the City of Kwinana and therefore does not include the full range of community infrastructure requirements, such as those facilities usually provided by other government agencies and private organisations (schools, health and medical facilities).

The CIP was originally prepared in 2010, and revised in 2015 and remains in draft form. The draft CIP anticipates the continual operation of Alcoa, and until issues associated with the associated buffer are resolved, planning for residential development in the area is based on the current Urban zoned land only. As such, the draft CIP and associated Amendment 145 (to incorporate changes to the revised CIP into the Scheme) proposes to remove the subject area from DCA 8.

An existing Local Community centre is identified in the southern portion of the subject area on Anketell Road. A Local Community Centre (Large Scale) and Local Sporting Ground is identified as being required adjacent to the subject area, on the western side of the Kwinana Freeway (refer **Figure 15**).

The Community Infrastructure Plan and Development Contributions should be reconsidered following the preparation of the Improvement Scheme.

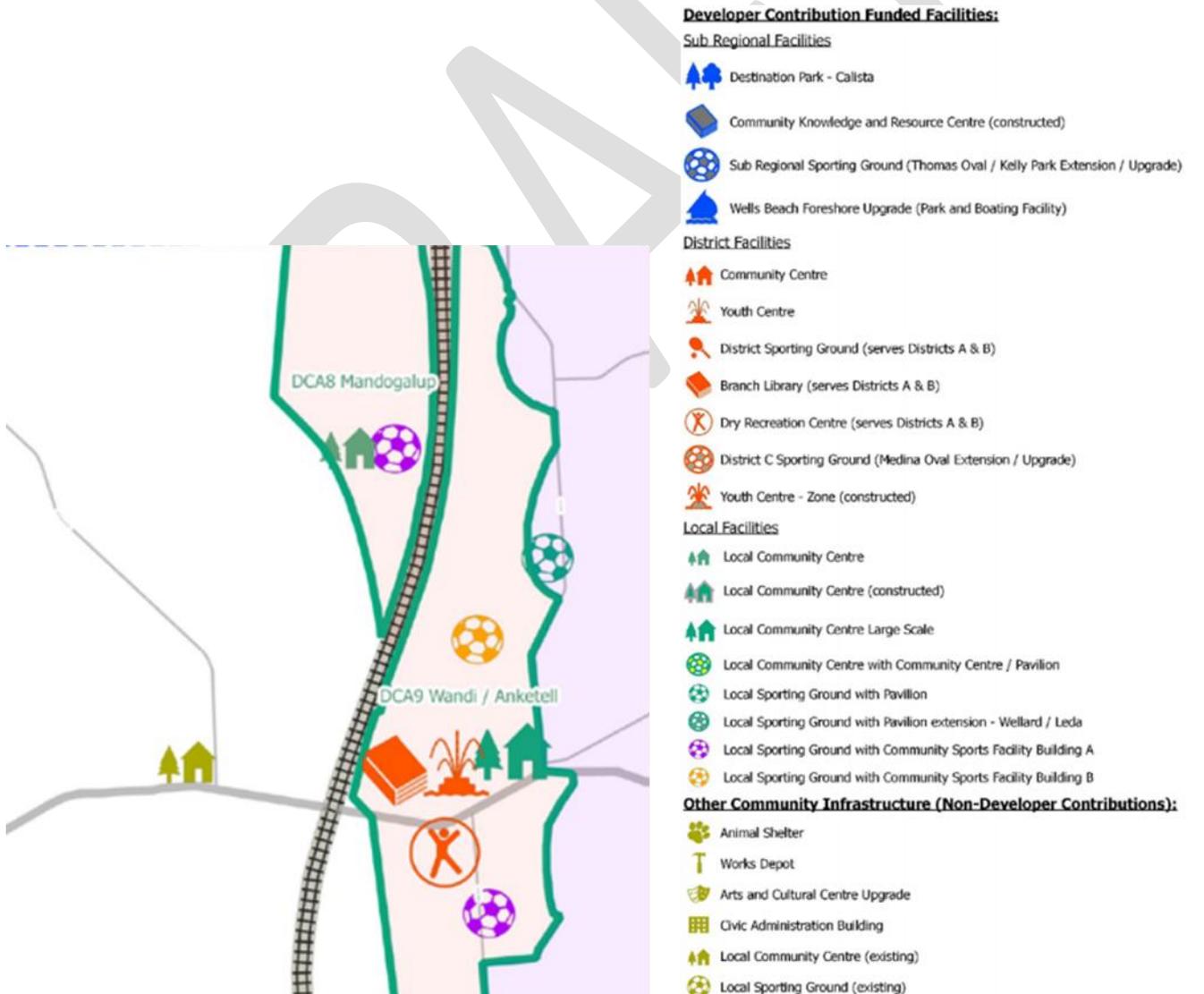


Figure 15: City of Kwinana draft Community Infrastructure Plan 2015 Extract

3.7 Local Planning Policies

The existing Local Planning Policies relevant to the subject area are outlined below. It is noted the Local Planning Policies will not apply to the subject area once the Improvement Scheme has been gazetted and have been provided for context only.

Local Planning Policy No. 1 Landscape Feature and Tree Retention

The City of Kwinana’s Local Planning Policy No. 1 (LPP 1) objectives are to ensure that retention of significant trees and landscape features are optimised through the strategic and statutory planning framework to retain the character of the area.

Retention of significant trees and landscape features will be prioritised in the formulation of land use scenarios for the subject area.

Local Planning Policy No. 2 Streetscapes

The objectives of the Local Planning Policy No.2 are to:

- Enhance the character of local streets through the delivery of an urban street tree canopy; and
- Encourage attractive streetscapes and enhance neighbourhood amenity.
- Future streetscaping and landscaping design should be prepared in consideration of the provisions of LPP 2.

Local Planning Policy No. 8 Designing out Crime

The purpose of Local Planning Policy No. 8 (LPP 8) is to set out design guidelines to reduce the likelihood of crime and anti-social behaviour in the City of Kwinana. Future land use scenarios should be prepared in accordance with Crime Prevention Through Urban Design (CPTED) principles, as outlined in LPP 8.

Local Planning Policy No. 12 Mandogalup Future Development

The City’s Local Planning Policy No.12 (LPP 12) was prepared to provide guidance to landowners, developers and Council to ensure that future development, zoning and Structure Planning occurs in a manner consistent with orderly and proper planning of the locality, and reflecting the highest and best use of land in the context and region.

The LPP refers to Areas A, B, C and D, which are based on the EPAs s16e Advice (refer **Section 2.10**) and are identified in **Figure 16**.

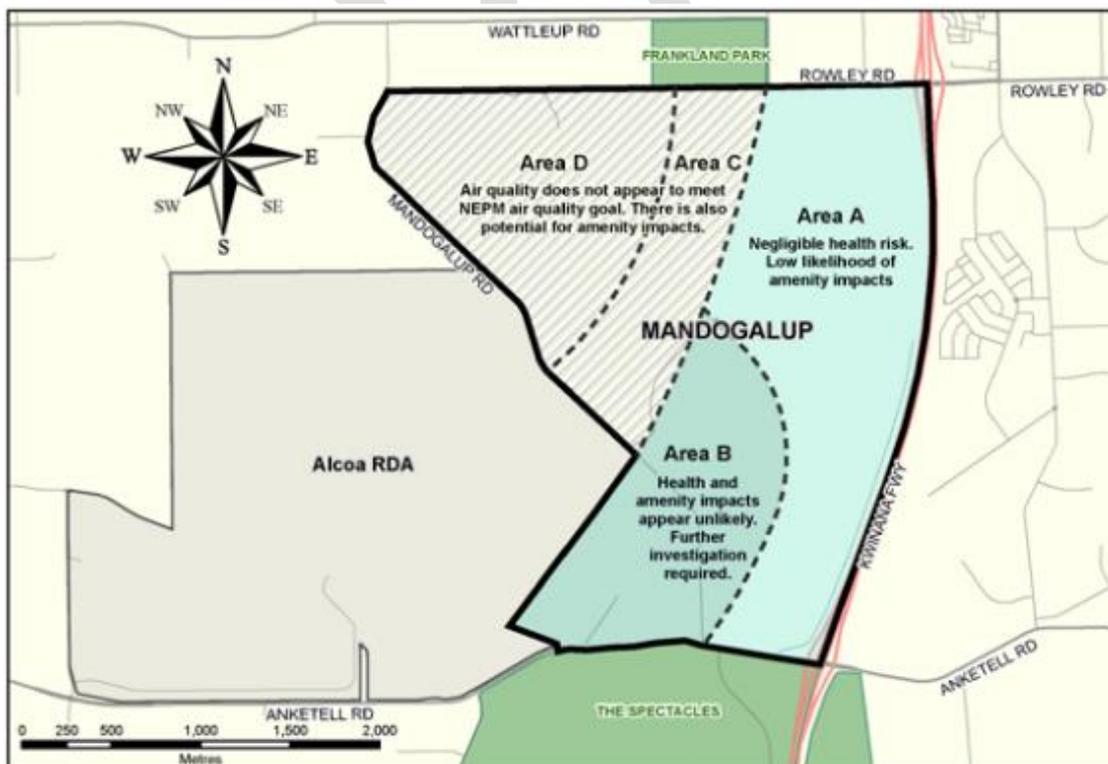


Figure 16: Mandogalup Area Buffer Zone EPA s16e Advice (Source: EPA, 2017)

The principles of the LPP are:

- The City supports the continued operation, development and protection of industrial land uses within and adjacent to the Mandogalup Area and will not support development that has the potential to restrict or impinge upon the future growth of industry in the region;
- Recognising the long-term importance of Kwinana Outer Harbour, land uses of a light industrial and service commercial nature will be promoted in Areas B, C and D as the desired future outcome of the area;
- There will need to be an appropriate interface within Area A between approved residential areas and adjacent light industrial and service commercial land uses in Areas B, C and D to protect the amenity of residents. An appropriate solution would be for this to take the form of composite area lots allowing for dual owner/operator residential/industrial uses; and
- Sensitive Land Uses will not be supported within Areas B, C and D.

The LPP includes a Policy Map (refer **Figure 17**), which identifies the majority of the Subject area as Light Industry, which is intended to be set aside for Light Industrial and Service Commercial Uses. Prior to rezoning, suitable investigation of appropriate lot sizes must occur to support such uses as freight and logistics in the area.

The eastern strip of the subject area is identified as a Transition Area, which is intended to support Composite Residential/Light Industrial Uses where residential and light industrial uses may be provided for on the same lot to provide for owner operator light industrial uses as well as providing a suitable interface between the Light Industry and Residential Areas. A minimum lot size of 0.5 hectare is considered appropriate.

The land east of the subject area is identified as a Residential Area.

LEGEND

-  Subject Area
-  Sandwich Lots
-  Light Industry Area
-  Residential Area
-  Transition Area
-  Station Precinct Area
-  Freight Road Interface Area
-  MRS Reserve
-  Policy Boundary

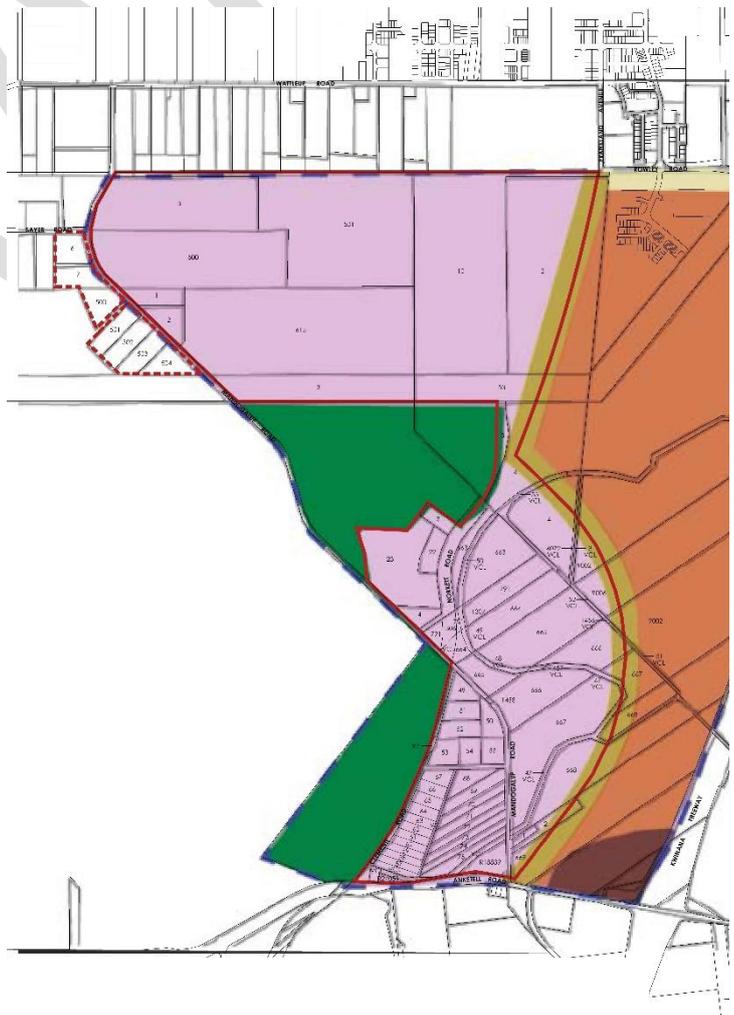


Figure 17: Local Planning Policy 12 Policy Map

Local Planning Policy Planning for Bushfire Protection Guidelines

The City of Kwinana Local Planning Policy Bushfire Protection Guidelines, adopts the current WAPC Planning for Bush Fire Protection Guidelines, and subsequent revisions at the discretion of the City.

As previously identified, the provisions of the Bush Fire Protection Guidelines have been considered and addressed in the Bushfire Management Plan, included in **Appendix D** and discussed in **Section 5.4**.

Local Planning Policy Public Open Space

The City of Kwinana's Local Planning Policy on Public Open Space requires plans to identify areas of regional and district open space, in accordance with the City of Kwinana's Community Infrastructure Plan, and include notional locations of local open space areas in addition to other land use elements.

The provision of POS on the subject area should be designed in accordance with the provisions of this Policy.

DRAFT

4.0 Improvement Scheme

4.1 Improvement Scheme

Section 122A of the PD Act enables the WAPC to introduce an Improvement Scheme in areas where an Improvement Plan is in place. Improvement Plan 47 authorises the making of an Improvement Scheme, by resolution of the WAPC and approval of the Minister for Planning. The following objectives will guide the preparation of the Improvement Scheme, as detailed in the Improvement Plan 47 text:

- to provide for a strategic land use analysis that takes into consideration physical, economic and environment factors;
- to provide a strategic planning framework to determine future land use considering all land use options (rural, urban and/or industrial);
- to provide a statutory planning instrument through which to implement the strategic planning framework;
- to provide a statutory land use planning instrument to effectively guide the preparation of statutory plans, statutory referral documentation and policy (as may be required) to facilitate orderly and proper planning of the area; and
- to facilitate the provision of an effective, efficient, integrated and safe transport network.

The structure of the Improvement Scheme is likely to be largely based on the Model and Deemed Provisions as set out in the *Planning and Development (Local Planning Schemes) Regulations 2015*, and varied where relevant to suit the unique circumstances of the subject area. Unlike local planning schemes, an Improvement Scheme is not bound to adopt or reflect the Model and Deemed Provisions as the relevant sections of the PD Act do not apply to Improvement Schemes. Notwithstanding, the Model and Deemed Provisions do provide a legible and appropriate structure for the most part, and the use of those provisions, where appropriate, will assist in maintaining the degree of consistency.

Noting that Improvement Plan 47 has already been gazetted, once the Improvement Scheme is gazetted it will give effect to the Improvement Plan 47 by:

- Establishing aims of the Scheme to facilitate the intended development;
- Establishing zones or precincts with associated land use permissibility;
- Providing land use and development guidance through scheme provisions and subject area and development requirements;
- Stipulating any environmental management requirements; and
- Providing for further planning instruments to guide decision making, including Improvement Scheme policies and local development plans.

4.2 Relationship of Improvement Scheme to Planning Schemes

Once the Improvement Scheme is gazetted, the MRS and the City of Kwinana's LPS No. 2 will cease to apply. The WAPC will be the decision maker for land use planning matters in the Improvement Scheme Area, and may choose to delegate certain decisions to the City of Kwinana, or another appropriate responsible authority. Should the land be normalised in the future, the Improvement Scheme would be repealed and the MRS and City of Kwinana's local planning scheme will again apply. If a portion of land is removed from the Improvement Scheme Area by an amendment to the Improvement Scheme, the Improvement Scheme for this area will cease to apply, and the MRS and the City of Kwinana local planning scheme will again apply to that removed land. Prior to either of these processes occurring, it is possible to undertake amendments to the MRS and / or local planning scheme to ensure that appropriate zones / reserves will apply to the land upon normalisation. The process under 5.2.4r Part 8 of the PD Act would be followed in respect of conformance of regional and local schemes with the Improvement Scheme.

This allows for further adjustments to zones and reserves etc. to be subject to detailed design and future amendments. Anomalies or inconsistencies between the Improvement Scheme and MRS and local planning scheme would be resolved through future conformance.

4.3 Improvement Scheme Framework

The components of the local planning framework, capable under the Improvement Scheme are detailed in **Table 3** below. The relevant planning instruments will be incorporated into the Improvement Scheme as considered necessary through the preparation process of the Improvement Scheme.

Table 3: Improvement Scheme Framework

Planning Instrument	Explanation
Improvement Scheme text	The range of statutory provisions necessary to effectively achieve the planning and development intent of Mandogalup.
Improvement Scheme map	Spatial definitions of the reserves and zones or precincts.
Improvement Scheme Policy	Guidance to articulate specific objectives and criteria on particular planning matters, and for the exercise of discretion provided by the Improvement Scheme.
Structure Plan	Coordinate future subdivision and zoning over land identified as requiring a structure plan before future subdivision and development is undertaken in the Improvement Scheme.
Design Guidelines	The design guidelines are adopted as an Improvement Scheme Policy.
Local Development Plan (LDP)	Coordinate and assist in achieving better built form outcomes by linking lot design with future development. An LDP can supplement development standards contained in the Improvement Scheme, policies and design guidelines.

5.0 Subject Area Conditions and Constraints

An Environmental Assessment Report has been prepared by Strategen-JBS&G to inform the preparation of the Improvement Scheme (refer **Appendix B**).

The assessment included analysis of previous flora and fauna surveys, and two field surveys to confirm aspects of the flora and fauna. Due to limited subject area access, the target spring flora survey was undertaken over a portion of the lots as identified in **Appendix B**.

5.1 Landform and Soils

5.1.1 Landscape and Topography

The topography of the subject area is generally varied and influenced by current land use. The northern section of the subject area shows topography generally sloping east to west from 35 and 40 mAHD to 10 mAHD at the north-western corner of the subject area. In the southern section of the subject area, there are topographic mounds at 20 to 23 mAHD which generally slope towards the PMD (12 to 13 mAHD). The Main Drain is shown as a more incised channel near the southern end of the subject area and shallower amongst the market garden areas of Mandogalup Swamp (13 mAHD). Elevation of the sandwich lots ranges from 14m AHD to 32m AHD.

5.1.2 Soils

Regional geological mapping identifies three geological units within the subject area and sandwich lots:

- Sandy silt - dark brownish grey silt, with disseminated fine-grained quarts sand, firm, variable clay content, of lacustrine origin.
- Sand - pale yellowish brown, medium to coarse-grained sub-angular quartz, trace of feldspar, moderately sorted, of residual origin.
- Sand - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted, of aeolian origin.

5.1.3 Acid Sulphate Soils

Acid Sulphate Soil risk mapping for the subject area indicates high to moderate risk of Acid Sulphate Soils occurring within 3m of the existing surface for silty soil areas of the subject area, in particular around Mandogalup Swamp. An Acid Sulphate Soil Investigation and Management Plan will be required prior to development.

5.1.4 Contamination

A search of DWER Contaminated Subject areas Database indicated there are no contaminated sites within the subject area.

The Alcoa RSA, down-gradient of the Study Area, is classified as a *Contaminated – remediation required* contaminated site. In response, JDA obtained a summary of records from DWER (refer **Appendix C** – DWMS for detail of records obtained).

Investigations of the Alcoa Kwinana site in 2006 identified high pH, alkalinity, electrical conductivity and salinity from sodium carbonate and hydroxide leakage from residue storage ponds. The summary of records suggests there is an elevated alkali contamination in the north-east corner of Area F of Alcoa's RSA, which was estimated to extend 100m outside of the Alcoa property. It is noted the buffer between the western lots of the subject area and the RSA is approximately 200m.

A PSI assessment and groundwater quality monitoring of lots west of Mandogalup Road will be required at the Structure Plan/LWMS stage to further ascertain any potential migration of the alkaline plume into the subject area.

A number of market garden operations currently or have previously operated within and surrounding the subject area. Market gardens are potentially contaminating land uses and are known to generate gaseous, dust, noise and odour emissions. A separate buffer between market gardens and sensitive land uses between 300m to 500m is generally recommended by the EPA. Reduced separate distances may be supported where technical studies demonstrate the risks associated with the potential emissions are mitigated.

A number of land uses currently or previously occurring on the subject area have the potential for contaminants to be discharged to the environment. A preliminary subject area investigation should be undertaken prior to development, to determine the potential nature of contamination (if any) across the subject area.

Key Considerations

Soil – Based on the soil type, development should be connected to a sewer to avoid potential environmental impacts.

Acid Sulfate Soils - An Acid Sulphate Soil Investigation and Management Plan will be required prior to development.

Contamination - A PSI assessment and groundwater quality monitoring of lots west of Mandogalup Road will be required at the Structure Plan/LWMS stage to further ascertain any potential migration of the alkaline plume into the subject area.

5.2 Environmental Considerations

5.2.1 Vegetation and Flora

5.2.1.1 Flora

No threatened flora listed under the EBPC Act or BC Act, or DBCA listed Priority flora have been recorded within lots which have been subject to a targeted flora survey. One Priority flora species, *Dodonaea hackettiana* (P4) was recorded in intact remnant native vegetation within the road verge on the western side of Norkett Road.

While the majority of vegetation is heavily degraded and infested with weeds, Vegetation Type 7 has the potential to contain threatened flora species *Drakaea elastica* and *Caladenia huegelii*; however, only a small area (0.08 ha) occurs within the subject area. The Threatened flora species *Drakaea micrantha* also has the potential to occur within firebreaks adjacent to areas of intact remnant native vegetation, i.e., sandwich lots, lots adjacent to remnant vegetation in Bush Forever subject areas (i.e., Lot 51 and 23 Mandogalup Rd). These areas have not been subject to a targeted flora survey.

5.2.1.2 Regional Vegetation

Regional vegetation mapping identifies the Karrakatta Complex-Central and South, the Bassendean Complex Central and South and the Herdsman Complex mapped across the subject area.

5.2.1.3 Vegetation Condition

The vegetation condition through the subject area ranges from Very Good to Excellent through to Completely Degraded and is primarily in a Completely Degraded state.

5.2.1.4 Threatened and Priority Ecological Communities

Two Threatened Ecological Communities (TEC) are present or possibly occur within the subject area:

- Banksia woodlands of the Swan Coastal Plain (TEC under EPBC Act; Priority 3 PEC listed by DBCA); and
- Tuart woodlands and forests of the Swan Coastal Plain (TEC under EPBC Act; Priority 3 PEC listed by DBCA).

Further analysis is required to confirm the presence or absence of these TECs within vegetation types where these are possible.

It is noted that over 50% of the subject area, and the sandwich lots, have not been subject to a flora and vegetation survey (publicly available). A large portion of the unsurveyed areas are cleared and occupied by market gardening land uses; however, some unsurveyed areas contain vegetation and should be surveyed prior to any clearing or development.

5.2.2 Fauna

The following conservation significant fauna species are considered to possibly or likely occur, or are known to occur within the subject area and/ or sandwich lots:

- *Calyptorhynchus banksii naso* (Forest Red-tailed Black-Cockatoo; FRTBC) - Threatened (EPBC Act/ BC Act);
- *Calyptorhynchus latirostris* (Carnaby's Cockatoo; CC - Threatened (EPBC Act / BC Act);
- *Falco peregrinus* (Peregrine Falcon) – Not Listed (EPBC Act), Other specially protected fauna (BC Act);
- *Isoodon fusciventer* (Quenda) – Not Listed (EPBC Act), Priority 4 (BC Act);
- *Lerista lineata* (Perth Slider) – Not Listed (EPBC Act), Priority 3 (BC Act);
- *Neelaps calonotos* (Black-striped Snake) – Not Listed (EPBC Act), Priority 3 (BC Act); and
- *Synemon gratiosa* (Graceful Sunmoth) – Not Listed (EPBC Act), Priority 4 (BC Act).

Additionally, 17 conservation significant migratory wetland species may utilise the REW.

5.2.2.1 Black Cockatoo Habitat

A total of 37.9 ha of Carnaby's Cockatoo habitat and 33.3 ha of Forest Red-tailed Black-Cockatoo habitat has been identified within the subject area, excluding cleared and unsurveyed areas which may provide additional habitat. A total of 3.1 ha of Carnaby's Cockatoo and Forest Red-tailed Black-Cockatoo habitat has been identified within the sandwich lots (excluding cleared and unsurveyed areas).

A total of 166 potential Black Cockatoo potential nesting habitat trees were recorded within the subject area, and 16 potentially suitable hollows. An additional 19 hollows were identified within a previous survey, for which no hollow suitability data was provided. Some of these hollows may also be potentially suitable. A total of 14 potential nesting habitat trees and 6 potentially suitable hollows have been identified within the sandwich lots.

A determination of suitability is required for these hollows, and it is likely that a small proportion of these hollows would be suitable for use by Black Cockatoos.

5.2.3 Conservation Areas

5.2.3.1 Bush Forever

Bush Forever site 393 is located within the north-western corner of the subject area (associated with Wattleup Lake). A small portion of Bush Forever site 268 is mapped within the subject area. The central and south-western portions of the subject area directly abut the large Bush Forever site 268, and the sandwich lots directly abut Bush Forever site 267. Interface treatments to protect the Bush Forever sites from future development, and consideration to bushfire setback requirements from the Bush Forever sites will have to be considered in the preparation of the Land Use Scenarios, and the Improvement Scheme in accordance with the requirements of SPP 2 and SPP 3.7.

5.2.4 Ecological Linkages

Regional Ecological Linkages connect protected Regionally Significant Natural Areas by retaining the best condition conservation areas and local natural areas available between them that can act as stepping stones for flora and fauna.

Regional ecological linkages for the Perth Metropolitan Region were identified and mapped by the Perth Biodiversity Project in 2003. Spatial data maintained by WALGA (2003) identifies two regional ecological linkages mapped within the subject area, largely covering the Bush Forever subject areas. The most obvious opportunity to enhance the existing mapped regional ecological linkage is within and surrounding Bush Forever subject area 393, including the REW and associated buffer, where rehabilitation would result in an improved environmental outcome. Vegetation within the sandwich lots also currently contributes to the north-western ecological linkage.

Key Considerations

Vegetation - development should be concentrated in areas which are mapped as “completely degraded” and “degraded”. Areas of vegetation which are of “good” quality or better, should be prioritised for retention, where possible.

Threatened Ecological Communities - Further statistical analysis, and assessments against diagnostic criteria are required to determine if Banksia Woodlands and Tuart woodlands TECs, do in fact occur within the subject area and sandwich lots.

Fauna - Future development should avoid impacts to black cockatoo habitat including significant trees, particularly those with potentially suitable nesting hollows.

Bush Forever – interface treatments to protect conservation areas from future development, and consideration to bushfire setback requirements from conservation areas.

Ecological Linkages – Consider opportunity to retain Ecological linkage within and surrounding Bush Forever subject area 393, including REW and associated buffer. Alternative green links could be proposed where formal ecological linkages are not possible due to other constraints (e.g. bushfire).

Unsurveyed portions of the subject area and sandwich lots should be subject to a Spring flora and vegetation survey prior to clearing / development to identify any conservation significant flora and vegetation. A targeted Winter survey would also be appropriate for any areas of habitat suitable for threatened *Drakaea* sp. Prior to any clearing or disturbance of vegetation / trees, these areas should also be surveyed to determine any significance to black cockatoos.

5.3 Dust

As outlined in **Section 2.10** of this report, DWER completed a study in 2018 to focus on the potential sources of dust impacting air quality in the north and north-eastern areas of Mandogalup, in response to the EPA’s s16(e) advice.

Major findings of DWER’s study are:

- Major contributors to overall dust levels in the area include the Alcoa RDA, sand and other quarries, roads, truck movements, agricultural activities and industrial activity in the Kwinana industrial area.
- The levels of PM10 dust at the Central and Norkett sites over the study period seem to be somewhat comparable to other locations in Perth and semi-rural areas in the wider Perth metropolitan area.
- Amenity impacts were unable to be assessed, except to note that the levels of total suspended particles (TSP – larger particles) seem to decrease with distance from the RDA.

Key Considerations

The advice of the EPA and DWER’s LiDAR dust monitoring report is the adopted position for the consideration of any dust issues to inform the Mandogalup Improvement Scheme.

TBB will analyse the information contained in DWER’s Dust Monitoring (LiDAR) report to help inform the Land Use Plan underpinning the proposed provisions of the Improvement Scheme.

5.4 Bushfire Hazard

Portions of the subject area are identified as being bushfire prone areas by the Fire and Emergency Services Commissioner (2019). As a result, a Bushfire Management Plan (BMP) is required to accompany the preparation of the Improvement Scheme, to address the following requirements of State Planning Policy 3.7 (SPP 3.7) Planning in Bushfire Prone Areas:

- A bushfire hazard level (BHL) assessment;
- Identification of any bushfire hazard issues arising from the above assessment; and
- Assessment against the bushfire protection criteria requirements contained within the Guidelines demonstrating compliance can be achieved in subsequent planning stages.

A BMP has been prepared for the subject area and is included in **Appendix D**. The BHL included in the BMP shows that based on the existing vegetation, the subject area and sandwich lots contain land with:

- Low bushfire hazard levels associated with areas of managed market gardening within the project area, greater than 100m from Moderate or Extreme bushfire hazards.

- Moderate bushfire hazard levels associated with areas of unmanaged grassland/ unmanaged market gardens (Class G grassland), or areas within 100m of Moderate or Extreme bushfire hazards, both within and adjacent to the subject area and sandwich lots.
- Extreme bushfire hazard levels associated with areas of Class A forest, Class B woodland and Class D scrub, and areas with an effective slope greater than 10 degrees, both within and adjacent to the project area and sandwich lots. It is noted that the only areas with a slope greater than 10 degrees occur on the batters to the Alcoa tailings ponds, however the project area is located downslope of these.

It is anticipated the predominant post-development bushfire hazards will be associated with the Bush Forever subject areas located to the south, west and north of the subject area. Where the development interfaces with intact vegetation, appropriate separation to development (habitable buildings) to achieve a bushfire attack level (BAL) rating of BAL-29 or lower will be required. It is considered that the bushfire risk to proposed development posed by these hazards can be managed through standard application of acceptable solutions under the Guidelines, as well as through a direct bushfire suppression response if required.

A post-development BHL assessment will be completed once the preferred Land Use Plan has been prepared.

Additionally, the development will be required to ensure adequate water supply for firefighting purposes, and appropriate vehicular access and egress provisions for residents and emergency services in accordance with the Guidelines.

Key Considerations

Bushfire – Separation to appropriate development required to achieve a BAL rating of BAL-29 or lower. Adequate water supply for firefighting purposes, appropriate vehicular access and egress required.

5.5 Noise

A Transportation Noise Assessment has been undertaken by Lloyd George Acoustics to assess the noise impact on the subject area from transportation along Anketell Road and the Kwinana Freeway in accordance with the criteria of SPP 5.4 and is included in **Appendix H**.

The assessment included noise measuring and modelling, and concluded with no noise control, road traffic noise levels in the south and south-east of the subject area exceeded the acceptable target for sensitive land uses.

The assessment recommended that sensitive land uses (e.g. residential, education, medical buildings, place of workshop, hotels), are located away from Anketell Road and the Kwinana Freeway, outside the outdoor target noise contour.

Industrial or commercial premises which are not noise sensitive would be best located closer to the transport corridors as these buildings may provide noise barrier effects to sensitive uses behind them.

For future noise sensitive premises where the outdoor noise target will be exceeded, (close to Anketell or Kwinana Freeway), the following is recommended:

- Investigate the effectiveness of noise walls at reducing traffic noise levels;
- Apply various architectural treatments to in the form of Package Treatment requirements; and
- All affected lots would also have notifications on titles in accordance with SPP 5.4 requirements.

Key Considerations

Anketell Road and Kwinana Freeway - carry heavy traffic volumes. Sensitive land uses should be located away from these land uses. Future consideration to be given to Rowley Road / Anketell Road traffic following the outcome of the Westport decision.

Rowley Road and Hammond Road extensions – additional studies recommended to understand potential noise impacts from these roads, including associated Westport traffic.

5.6 Groundwater and Surface Water

A District Water Management Strategy has been prepared by JDA to consider the existing environment of the subject area, and inform the preparation of the Improvement Scheme, included in **Appendix C**.

5.6.1 Surface Hydrology

The PMD and sub-drain occur within the central and southern portions of the subject area. The PMD is a rural drain that forms a regional drainage network, running through many wetlands and other low-lying areas. The PMD generally flows north-east to the south-west through the extent of the subject area.

A Water Corporation open channel is located in the south-west corner of the subject area and connects to the PMD near Anketell Road.

In the north-western section of the subject area, any surface water will flow towards Wattleup Lake. In the north-east section, surface water flow is to a topographic low-point within the Banksia Woodlands.

5.6.2 Groundwater

The hydrogeological formations under the subject area include three distinct aquifers. In descending order of depth from the natural surface water they are; Superficial Aquifer, Leederville Aquifer and Yarragadee Aquifer.

Regional historical maximum groundwater contour mapping indicates that the water table is situated at approximately 12 m AHD in the north-western portion of the subject area, increasing to approximately 20m AHD in the north-eastern corner of the subject area.

Based on a review of groundwater contour data, regional topographic contours and expressions of surface water (based on aerial imagery and subject area walkover), groundwater is above natural surface level in the north-western corner of the subject area. Depth to groundwater in the north-eastern portion of the subject area is expected to be up to 20 m below ground level, while groundwater in the southern portions of the subject area is anticipated to range from "at surface" to over 15 m below ground level.

A number of groundwater bores and associated abstraction licences currently exist across the subject area and sandwich lots. These bores could be utilised for groundwater abstraction where required, such as for construction purposes or irrigation of public open space.

5.6.3 Flows and Levels

The Perth Groundwater Atlas estimates the maximum groundwater levels range from 18mAHD in the north-eastern corner of the subject area to 10 to 11mAHD respectively in the north-west and south-west corner of the subject area.

5.6.4 Groundwater Availability

DWER groundwater allocation limits and remaining available abstractions from the relevant aquifers show all aquifers are over-allocated with no allocations available.

Total current allocation across the subject area is approximately 2,250,000kl/yr; 70% of which is under a single licence. All licences are for the Superficial aquifer.

Land developers would need to trade for licence(s) as the groundwater areas are fully allocated (for non-potable water).

5.6.5 Local Water Management Strategy

Specific issues identified in the DMWS which need to be further investigated as part of the LWMS include:

- Hydrological management of the wetlands and protection of environmental assets;
- Retention of existing flow paths and natural drainage systems located throughout the Study Area;
- Irrigation supply and water efficiency measures for irrigation of POS;
- Refine catchment and sub-catchment areas to maintain pre-development flows entering and leaving the subject area;
- Geotechnical investigation;
- Earthworks and fill strategy; and
- An ASS investigation and Management Plan will be undertaken at the appropriate development phase to identify the exact extent and depth and whether it will impact future proposed development.

Key Considerations

Groundwater – prior to development, groundwater modelling should be undertaken to confirm maximum groundwater levels.

PMD Realignment – The extent of realignment would need to be discussed with Water Corp and DWER, however constraints such as maintaining peak water levels and flow rates at the upstream and downstream extent of the realignment would need to be met (for 5, 10- and 100-year ARI events). Maintaining cross sectional area may be sufficient if the realignment has similar length to the existing, but other factors also come into play depending on design.

Living Stream Potential – If drain is realigned, consider implications of living stream approach, including spatial implications and bushfire management implications.

Groundwater Suitability – The groundwater suitability for abstraction may need to be confirmed through water quality sampling, particularly noting the potential for contamination migration from Alcoa's operations.

Local Water Management Plan and Urban Water Management Plans – to be prepared at future stages of development to demonstrate how groundwater will be managed to ensure pre-development groundwater conditions are maintained in accordance with Better Urban Water Management.

5.7 Geomorphic Wetlands

Mapping of the geomorphic wetlands of the Swan Coastal Plain) identifies four wetlands within the subject area:

- UFI 6610 (Wattleup Lake) Basin/ lake - Resource Enhancement (REW) – located in the north-western corner of the subject area;
- UFI 6531 Basin/ dampland - Multiple Use – located in the north-western corner of the subject area, south of the Resource Enhancement wetland;
- UFI 6530 (Mandogalup Swamp North) Basin/ dampland - Multiple Use – located in the central portion of the subject area; and
- UFI 6538 (Mandogalup Swamp South) Basin/ dampland - Multiple Use – located in the southern portion of the subject area.

As the wetland is a REW and located within a Bush Forever subject area, development within the wetland would not be possible. An appropriate buffer to the REW would also be required to maintain the ecological processes and functions associated with the wetland. The DBCA advised by letter on 14 August 2020 that a 50m buffer to the Wattleup Lake is recommended, and a Wetland Management Plan is to be prepared before development occurs.

Key Considerations

Resource Enhancement Wetland – in the north-western portion of the subject area to be retained with an appropriate buffer applied. Width of buffer to be determined by WAPC in consultation with the DBCA and the land owner / manager, noting the DBCA's recommendation for the buffer to be 50m.

5.8 Heritage

5.8.1 Aboriginal

A search of the Department of Planning, Lands and Heritage – Aboriginal Heritage Places mapping tool (DPLH 2017) found no registered Aboriginal heritage subject areas within the subject area.

Two "Other Heritage Places", Mandogalup Swamp Spectacles (Place ID: 3427, Type: Mythological, Hunting Place, Water Source) and Norkett Road (Place ID: 4360, Type: Artefacts/Scatter) intersect with the subject area but have a status of "Stored Data/Not a Subject area" and therefore do not meet the criteria to be considered a registered subject area.

It is acknowledged that the Aboriginal Heritage Act 1972 is currently being reviewed, to provide more effective protection, conservation and management of Aboriginal cultural heritage in Western Australia, and it is anticipated that the Western Australian Government will introduce the Aboriginal Cultural Heritage Bill 2021 in the near future.

Any necessary future investigations regarding Aboriginal Heritage matters will follow the due diligence process.

5.8.2 European

A search of the inHerit database identified 10 heritage places as listed below in **Table 4**, which are on the City's Municipal Inventory. None are listed as State Registered Places or Places of National Significance.

Table 4 European Heritage Subject Area Mapped Within Subject Area

Place Number	Place Name	Statutory Listing	Other Listings
12087	Mandogalup Post Office (fmr)	N/A	Municipal Inventory Adopted 13 May 1998 (City of Kwinana)
12100	Hall Reserve - Mandogalup	N/A	Municipal Inventory Adopted 13 May 1998 (City of Kwinana)
12123	Mandogalup School Cottage - subject area	N/A	N/A
12130	7 Mile Subject area ("Sevvy" to later settlers)	N/A	Municipal Inventory Adopted 13 May 1998 (City of Kwinana)
12106	Lake Wattleup / Sayer Road Swamp	N/A	Municipal Inventory Adopted 13 May 1998 (City of Kwinana)
12111	Mandogalup School – Subject area of	Heritage List Adopted 20 Nov 1992 (City of Kwinana)	Municipal Inventory Adopted 13 May 1998 (City of Kwinana)
12125	Mandogalup Townsite	N/A	Municipal Inventory Adopted 13 May 1998 (City of Kwinana)
12114	Jolly's Bridge	N/A	Municipal Inventory Adopted 13 May 1998 (City of Kwinana)
12129	6 Mile Subject area	N/A	Municipal Inventory Adopted 13 May 1998 (City of Kwinana)
12092	Soldier Settler Homes, Mandogalup	N/A	Municipal Inventory Adopted 13 May 1998 (City of Kwinana)

Subject areas listed by local governments on their municipal inventories are generally considered significant to their local community. Prior to development in the location of European heritage subject areas, the City should be consulted to determine the compatibility of any land uses proposed, and to identify any development restrictions or opportunities.

Key Considerations

Aboriginal Heritage - Liaison with DPLH is required to determine if an Aboriginal heritage survey or consultation with relevant Aboriginal people is warranted.

European Heritage – consultation with the City to determine compatibility of land uses with heritage listed subject areas and to identify any development restrictions or opportunities.

5.9 Movement Network

A Transport Report has been prepared to inform the Improvement Scheme, and is included in **Appendix F** and summarised below. The Transport Report will be updated to consider the implications of Westport's transport design, once this is available.

5.9.1 Road Network

The subject area's location provides convenient access to the existing and future strategic road network. The Rowley Road corridor abuts the subject area to the north Anketell Road is located to the south. The Kwinana Freeway is located 1km to the east of the subject area.

5.9.1.1 Rowley Road and Wattleup Road

Rowley Road and Wattleup Road are classes as Regional Distributor Roads, with a posted speed limit between 70km/hour and 80km/hour. Wattleup Road runs east west between Rockingham Road and Frankland Avenue, while Rowley Road runs east-west from Frankland Avenue almost to the South Western Highway.

Rowley Road and Wattleup Road are both constructed at 7m single carriageway roads within a 20m road reserve. Rowley Road immediately west of the Kwinana Freeway, reveals Rowley Road carries approximately 7,900 vehicles per day with 14.9% heavy vehicles.

The configuration of the Rowley Road interchange with Kwinana Freeway consists of a bridge structure over the Freeway reserve as a single lane carriageway and turning lanes to facilitate movement on to the Freeway in both directions. The area within the reserve indicates that there is room for substantial expansion of the carriageway and interchange.

Rowley Road has historically been identified as a primary freight route to the Kwinana Industrial Area and future container port, however the final outcome of the Westport Study will confirm the preferred freight route(s) to connect any proposed alterations to the configuration of port activities at Kwinana and the broader heavy vehicle network.

5.9.1.2 Anketell Road

Anketell Road is classed as a Regional Distributor, with a posted speed limit of 80km/hour immediately adjacent to the subject area, increasing to 90km/hour further west. Anketell Road runs east-west between Rockingham Road and Thomas Road.

Anketell Road is constructed as a single carriageway, approximately 8m wide. To the east of Mandogalup Road, the Anketell road reservation is 20m, and to the west of Mandogalup Road the reserve width varies but is at least 30m wide. Anketell Road carries 14,300 vehicles per day with 19.8% heavy vehicles.

The configuration of Anketell Road interchange with Kwinana Freeway comprises a bridge structure over the Freeway reserve, as a single lane carriageway. However, the area within the reserve indicates that there is room for substantial expansion of the carriageway and interchange.

Anketell Road is an existing primary freight and over-sized vehicle route. It is assumed this role would continue into the foreseeable future, acknowledging that the longer-term configuration and the associated intersections and interchange may vary depending on the final outcome of the Westport Study.

5.9.1.3 Mandogalup Road

Mandogalup Road is classed as a Local Distributor and generally runs north-south between Wattleup Road and Anketell Road. The posted speed limit varies between 70 and 80km/hour. Mandogalup Road is a rural standard single carriageway within a 20m road reserve.

5.9.1.4 Other Regional Road Extension to Hammond Road

A north-south 'Other Regional Road' is indicated in the MRS running through the subject area. The road is planned to intersect with Anketell Road to the south and to the existing alignment of Hammond Road to the north where it continues to Cockburn Central. The future planning for this road has commenced with the allocation of a reserve identified within various structure plans within the City of Cockburn.

Its designation as a Regional Road has flow on effects in terms of permitted land uses and access controls either side and has the designated functions of an Integrator Arterial as outlined in Liveable Neighbourhoods.

5.9.1.5 Restricted Access Vehicle Network

The Restricted Access Vehicle Network (RAV) is a critical infrastructure link for access between the future Kwinana port and wider transport network. The network will have direct implications for Mandogalup given its proximity to the future Kwinana port.

Rowley Road, Wattleup Road and Anketell Road are part of Network 4, accommodating vehicles up to 27.5m in length. Thomas Road and the Kwinana Freeway are part of Network 7, accommodating vehicles up to 36.5m in length and a mass of 107.5 tonnes.

5.9.2 Public Transport

The existing public transport network in proximity to the subject area includes the Aubin Grove and Kwinana train stations on the Mandurah line located to the north and south of the subject area. Train station feeder bus routes serve the residential land uses to the north, east, and south, while to the west Rockingham Road and Cockburn Road carry bus service between Fremantle and Rockingham.

Mandogalup was originally planned to have a train station; however, this is no longer the case following a review by the PTA.

5.9.3 Pedestrian & Cycle Network

There is no existing pedestrian network within the subject area, and the limited road network has no pedestrian paths. The existing cycling network comprises a Principal Shared Path (PSP) which runs north-south along the western side of the Kwinana Freeway and the various Perth Bicycle Network routes along Wattleup Road, Rowley Road, and Mandogalup Road.

Key Considerations

Rowley Road and Anketell Road – consider final outcome of the Westport Study to confirm the preferred freight route(s) to connect any proposed alterations to the configuration of port activities at Kwinana and the broader heavy vehicle network.

Kwinana Freeway – Consider opportunities to utilise proximity to Kwinana Freeway.

Hammond Road – Consider implication of Hammond Road extension through subject area and its designation as a Regional Road – e.g. flow on effects in terms of permitted land uses and access controls either side and the designated functions of an Integrator Arterial as outlined in Liveable Neighbourhoods.

Public Transport – comprises bus networks connecting to the Aubin Grove and Kwinana train stations. Mandogalup train station no longer planned by the PTA.

5.10 Service Infrastructure

Wood and Grieve Engineers have undertaken an Infrastructure and Engineering Services Assessment for the subject area, which is included in **Appendix G**.

5.10.1 Water Reticulation

The majority of the subject area is not currently serviced as part of the Water Corporation's water supply scheme. The nearest water reticulation main is located within Rowley Road, near Irvine Parade.

Future water distribution mains are planned by the Water Corporation as part of their Capital Investment Programme, and traverse the eastern edge of the subject area. The ultimate location of the mains will however be dependent on the nature of development proposed on the subject area.

5.10.2 Wastewater Reticulation

The subject area is not currently serviced by the Water Corporation's wastewater scheme. Existing development within the subject area utilise onsite disposal methods.

Water Corporation's long-term planning for wastewater disposal from the subject area comprises four proposed wastewater pumping stations and associated discharge pressure mains. Three pump stations are located within the subject area, and one of the pump stations is located north of the subject area. The pump station subject areas and discharge pressure mains

traverse a number of private properties, which will require significant coordination and cooperation to allow for resolution of land matters to facilitate constructions.

5.10.3 Power

The subject area contains a number of Western Power Corporation's overhead power transmission lines, which includes:

- 330kV Kwinana to Southern Terminal Line (2 lines);
- 132kV Kwinana to Southern Terminal Lines;
- 330kV Muja to Southern Terminal / Kemerton Line; and
- 330kV Kwinana to Northern Terminal Line.

These lines traverse the subject area in various locations as detailed in **Appendix G**.

A number of 22kV high voltage overhead power lines are located within the subject area to facilitate power supplies to existing properties. The location of these overhead high voltage power lines is detailed within **Appendix G**.

In terms of infrastructure capacity, Western Power Corporation's Network Capacity Mapping Tool shows approximately 25MVA to 30MVA of network capacity is available. It is anticipated this capacity would be ample for development of the subject area, however this will require review once the preferred Land Use Plan has been developed. This may require installation of new underground 22kV feeder cables from the nearest zone substations to the development areas.

5.10.4 Telecommunications

The subject area is currently serviced by Telstra infrastructure located within existing road reserves throughout the subject area, which provides services to the existing properties. The existing infrastructure includes copper and optic fibre services. Optus telecommunications infrastructure is also located within the subject area.

5.10.5 Gas

The subject area is not currently serviced by reticulated gas. The nearest existing Atco Gas mains are located to the north of the subject area within Rowley Road. Subject to the nature of the development on the subject area and road reserve linkages, it is envisaged gas mains may be extended through the subject area from the north.

The DBNGP traverses the southern section of the subject area. Depending on the nature of development on the subject area, significant development setbacks and controls may be required. A risk assessment will be prepared based on the draft Land Use Plan, to determine specific setbacks and development controls.

Key Considerations

Water – subject area is not currently serviced as part of the Water Corporation's water supply scheme, consider future connections which will be dependent on nature of development proposed.

Wastewater – subject area is not currently serviced. Consider implications of future pump station subject areas and discharge pressure mains which traverse a number of private properties, and will require significant coordination and cooperation to allow for resolution of land matters to facilitate constructions.

Power - anticipated there is capacity for development of the subject area, however this will require review once the preferred Land Use Plan has been developed.

Communications - subject area is currently serviced by Telstra infrastructure.

Gas – subject area not currently serviced - gas mains may be extended through the subject area from the north.

The DBNGP traverses the southern section of the subject area. Depending on the nature of development on the subject area, significant development setbacks and controls may be required.

5.11 Land Demand and Market Analysis

A Land Supply and Demand Analysis has been prepared by Pracsys and is included in **Appendix E**. The analysis was undertaken to assess the supply and demand for different land uses for the subject area. It identified the following:

- Industrial Land:

- 2,874ha of land is available for future industrial uses (excluding the subject area);
- Demand for industrial land could be between 2,200 and 3,300ha by 2041;
- Based on conservative uptake projections for industrial land in the Study Area, there is a potential gap in the provision of industrial land.
- Residential Land:
 - Undeveloped urban land for residential purposes could accommodate 130,220 dwellings at the Framework's target dwelling density for new residential developments of 15 dwellings per gross hectare;

The greenfield target for dwellings to 2050 is 129,330 dwellings;

- The analysis indicates that the current supply of undeveloped could support the Sub-regional dwelling targets for 2050 based on the Framework's target density per gross hectare.
- Commercial Floorspace
(Retail floorspace from activity centres that support other floorspace uses was used as a proxy for commercial floorspace):
 - Planned retail floorspace in district and regional level centres is 588,000m²;
 - There is a projected need for 589,000m² of retail floorspace by 2041 based on current service ratio (floorspace/population);
 - There a potential need for 729,000m² of retail floorspace if higher levels of retail provision are targeted (higher floorspace to population ratio);
 - There is a potential gap in commercial/retail floorspace that would depend on the drivers for achieving a higher service ratio in the subject area. Service ratios are measured by floorspace (m²) per person. The Study Area currently has lower service ratios than the Perth and Peel average.
- Rural Land:
 - The City of Kwinana Rural Land Study identified low levels of demand for rural land that was suitable in size for agricultural activities;
 - State policy supports the protection of state, regional and locally significant agricultural areas;
 - The subject area has not been identified as a priority agricultural precinct – further confirmation of its potential status would be required;
 - Demand for rural land appears to be low;
 - Two of the larger businesses related to agriculture in the subject area undertake packing and distribution activities on their properties, which would be suited to industrial land zoning.

The land use analysis identified a likely gap in the provision of industrial land in the study area under high and medium growth scenarios. There appears to be a sufficient supply of undeveloped residential zoned land to meet the projected population growth to 2050, assuming average density of 15 dwellings per gross ha (based on the targeted gross dwelling density in the Framework). This is further supported by the likely increasing density of residential developments, particularly around Transit Orientated Developments (i.e., high-density development around a train station). There is sufficient commercial floorspace to support projected population growth to 2041 based on the current provision of commercial floorspace compared to population. The study area currently has a lower provision rate of retail floorspace than the Greater Perth average (measured in retail floorspace m² per resident); if the Greater Perth average provision of retail floorspace per person was targeted for the study area, additional retail floorspace could be required before 2041.

SPP 2.5 has identified a need to protect state, regional or locally significant agricultural precincts in the Metropolitan area. The subject area has not been identified as a significant agricultural precinct, although this should be verified with the Department of Primary Industries and Regional Development. The City's rural land study determined there was limited demand to buy land where agricultural activities could be undertaken, which could be an indication that the area is not a significant agricultural precinct.

5.11.1 Westport Analysis

Following the preparation of the Land Supply and Demand Analysis in 2019, the Western Australian Government announced that Western Australia's future container port will be built in Kwinana (Westport). To consider the implications of Westport on the Western Trade Coast (WTC) and subject area, Pracsys prepared an additional report to quantify the current amount of industry displacement that might occur due to the Westport plans (contained in **Appendix E**). The report is effectively a more detailed analysis of the 'High' growth scenario from Pracsys' original Land Supply and Demand Analysis.

The report identified a potential gap in available industrial land in the WTC of 190ha in the medium growth scenario, and 612ha in the high growth scenario by 2041. It was determined that in the medium growth scenario most Population Driven uses (i.e., uses that are not location-reliant and can readily be delivered anywhere) would transition out of the WTC and in the High scenario, all Population Driven uses and some Strategic uses (i.e., uses which are related to activities located at the Port and benefit from proximity to the port) would transition out of the WTC.

Should Strategic uses want to be accommodated at the subject area, planning needs to send clear signals by appropriately zoning the subject area, providing suitable lot sizes for desired uses and ensuring a suitable transition from Strategic uses to residential development from west to east. The report concludes that planning for Strategic uses is seen as the most flexible option. The development of these uses is likely to occur over a longer timeframe and should demand not eventuate, it is likely that the land could be rezoned to accommodate more population orientated uses.

Key Considerations

Industrial – Potential gap in the provision of industrial land.

Commercial - There is sufficient commercial floorspace to support projected population growth to 2041 based on the current provision of commercial floorspace compared to population. There is a potential gap in commercial/retail floorspace that would depend on the drivers for achieving a higher service ratio in the subject area.

Residential - There appears to be a sufficient supply of undeveloped residential zoned land to meet the projected population growth to 2050.

Rural – There are low levels of demand for rural land.

6.0 Opportunities and Issues Analysis

The opportunities and issues have been identified through the analysis of the technical reports, and are illustrated in **Figure 16**, **Figure 17** and **Figure 18**. The opportunities and issues will be refined and updated as additional analysis is undertaken for the subject area.

6.1 Movement

Movement opportunities and issues summarised in **Figure 18** include:

- **Rowley Road and Anketell Road** – consider final outcome of the Westport Study to confirm the preferred freight route(s) to connect any proposed alterations to the configuration of port activities at Kwinana and the broader heavy vehicle network.
- **Kwinana Freeway** – Consider opportunities to utilise proximity to Kwinana Freeway.
- **Hammond Road** - Consider implication of Hammond Road extension through subject area and its designation as a Regional Road – e.g. flow on effects in terms of permitted land uses and access controls either side and the designated functions of an Integrator Arterial as outlined in Liveable Neighbourhoods.
- **Public Transport** – comprises bus networks connecting to the Aubin Grove and Kwinana train stations. Mandogalup train station no longer planned by the PTA.
- **Anketell Road and Kwinana Freeway** - carry heavy traffic volumes. Sensitive land uses should be located away from these land uses. Future consideration to be given to Rowley Road / Anketell Road traffic following outcome of Westport decision.
- **Rowley Road and Hammond Road extensions** – consider potential noise impacts from these roads, including associated Westport traffic.

LEGEND

-  Subject Area
-  Sandwich Lots

-  **Rowley Road and Anketell Road** - Consider outcome of Westport Study to confirm preferred freight route(s).
-  **Kwinana Freeway** - Consider opportunities to utilise proximity to Kwinana Freeway.
-  **Hammond Road** - Consider implication of Hammond Road extension through site and its designation as a Regional Road - e.g. permitted land uses and access controls either side.
-  **Mandogalup Road** - Consider implications of potential realignment of Mandogalup Road through to Mandogalup East LSP.

-  **Public Transport** - Comprises bus networks connecting to the Aubin Grove and Kwinana train stations. Mandogalup train station no longer planned by the PTA.
-  **Anketell Road and Kwinana Freeway** - Carry heavy traffic volumes. Sensitive land uses should be located away from these land uses. Future consideration to be given to Rowley Road / Anketell Road traffic following outcome of Westport decision.
-  **Rowley Road and Hammond Road Extensions** - Additional studies recommended to understand potential noise impacts from these roads, including associated Westport traffic.

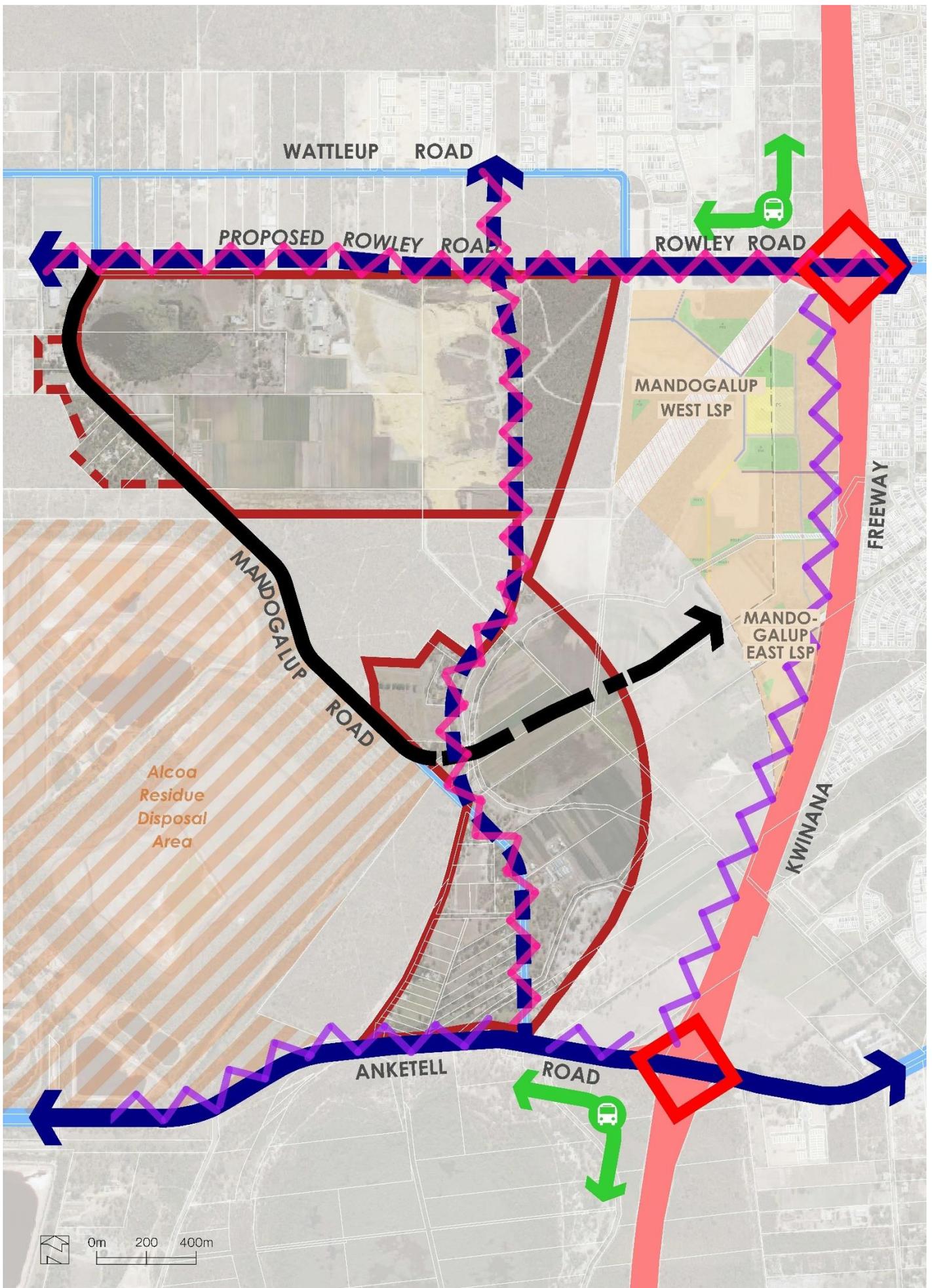


Figure 18: Opportunities and Issues - Movement

6.2 Land Use & Built Form

Land use and built form opportunities and issues, summarised in **Figure 19** include:

- **Fragmented Land Ownership** - will require coordination and cooperation to allow for resolution of land matters to facilitate development.
- **Soil** – Based on the soil type, development should be connected to a sewer to avoid potential environmental impacts. Development should avoid areas of Sandy Silt associated with the REW in the north-western portion of the subject area. Where development is proposed in Sandy Silt across other parts of the subject area, the importation of fill (or cut-fill) will likely be required to achieve appropriate separation to groundwater.
- **Acid Sulfate Soils** - An Acid Sulphate Soil Investigation and Management Plan will be required prior to development.
- **Contamination** - A PSI assessment and groundwater quality monitoring of lots west of Mandogalup Road will be required at the Structure Plan/LWMS stage to further ascertain any potential migration of the alkaline plume into the subject area.
- **High Voltage transmission corridor** - transverses the subject area from the east to west in the centre of the subject area and north to south along the south-eastern boundary.
- **Sand Quarry** – located in northern portion of subject area – opportunity to fill subject area following expiration of quarry licence.
- **Market Gardens** - Consideration of appropriate setbacks and interface treatments between sensitive land uses and market gardens will be required for both market gardens external to the subject area, and market gardens within the subject area.
- **Groundwater** – prior to development, groundwater modelling should be undertaken to confirm maximum groundwater levels.
- **PMD Realignment** – Consider potential realignment of PMD.
- **Living Stream Potential** – If the PMD is realigned, consider implications of living stream approach, including spatial implications and bushfire management implications.
- **European Heritage** – consideration to European heritage subject areas located in the subject area. Consultation with the City to determine compatibility of land uses with heritage listed subject areas and to identify any development restrictions or opportunities.
- **Water** – subject area is not currently serviced as part of the Water Corporation's water supply scheme, consider future connections which will be dependent on nature of development proposed.
- **Wastewater** – subject area is not currently serviced. Consider implications of future pump station subject areas and discharge pressure mains which traverse a number of private properties, and will require significant coordination and cooperation to allow for resolution of land matters to facilitate constructions.
- **Power** - anticipated there is capacity for development of the subject area, however this will require review once the preferred Land Use Plan has been developed.
- **Communications** - subject area is currently serviced by Telstra infrastructure.
- **Gas** – subject area not currently serviced - gas mains may be extended through the subject area from the north.
- **The DBNGP** - traverses the southern section of the subject area. Depending on the nature of development on the subject area, significant development setbacks and controls may be required.
- **Industrial Land** – Likely gap in the provision of industrial land. subject area is ideally located to serve as non-strategic industrial land, providing a transitional area between the neighbouring strategic industrial land uses and adjacent urban developments.
- **Commercial Land** - potential gap in commercial floorspace that would depend on greater private investment being realised in the subject area. Certain commercial uses could also be considered to support the rapidly growing population.
- **Residential Land** - There is sufficient undeveloped residential zoned land to support population projections. Presence of the Alcoa tailing dams likely act as a deterrent to potential buyers.
- **Rural Land** - The low levels of demand for rural land. Does not appear to be best use of the land.

LEGEND

-  Subject Area
-  Sandwich Lots

A **Aboriginal Heritage** - Liaison with DPLH is required to determine if an Aboriginal heritage survey or consultation with relevant Aboriginal people is warranted.

 **European Heritage (portion within Subject Area)** - Consultation with the City to determine compatibility of land uses with heritage listed sites and to identify any development restrictions or opportunities.

- | | |
|------------------------------------|-------------------------|
| 1 Lake Wattleup / Sayer Road Swamp | 6 Soldier Settler Homes |
| 2 6 Mile Site | 7 Jolly's Bridge |
| 3 Mandogalup Townsite | 8 Hall Reserve |
| 4 Mandogalup School | 9 Balmanup Post Office |
| 5 Tramway Reserve | 10 7 Mile Site |

S **Wastewater** - Site not currently serviced - consider implications of future pump station sites and discharge pressure mains which traverse a number of private properties.

W **Water** - Site not currently serviced - consider future connections which will be dependent on nature of development proposed.

P **Power** - Anticipated there is capacity for development of the subject site however, this will require review once the preferred scenario has been developed.

C **Communications** - Site is currently serviced by Telstra infrastructure.

G **Gas** - Subject site not currently serviced - gas mains may be extended through the subject site from the north.

***** **Groundwater** - Monitoring should be undertaken to confirm maximum groundwater levels.

***** **Groundwater Suitability** - for abstraction may need to be confirmed through water quality sampling.

 **The Dampier to Bunbury Natural Gas Pipeline** - Traverses the southern section of the subject site. Depending on the nature of development on the site, development setbacks and controls may be required.

 **Western Power Corridors** - Existing Western Power Corridors Restriction Zones traverse the subject site.

 **Peel Main Drain** - Potential realignment to be discussed with Water Corp and DWER, considering constraints such as maintaining peak water levels and flow rates at the upstream and downstream extent of the realignment would need to be met.

 **Living Stream Potential** - If drain is realigned, consider implications of living stream approach, including spatial implications and bushfire management implications.

 **Market Garden** - Consider existing market gardens and associated buffer requirements / implications.

 **Sand Mining** - Approval for sand mining over identified land.

 **Public Purpose Site** - Site currently designated for Public Purpose use.

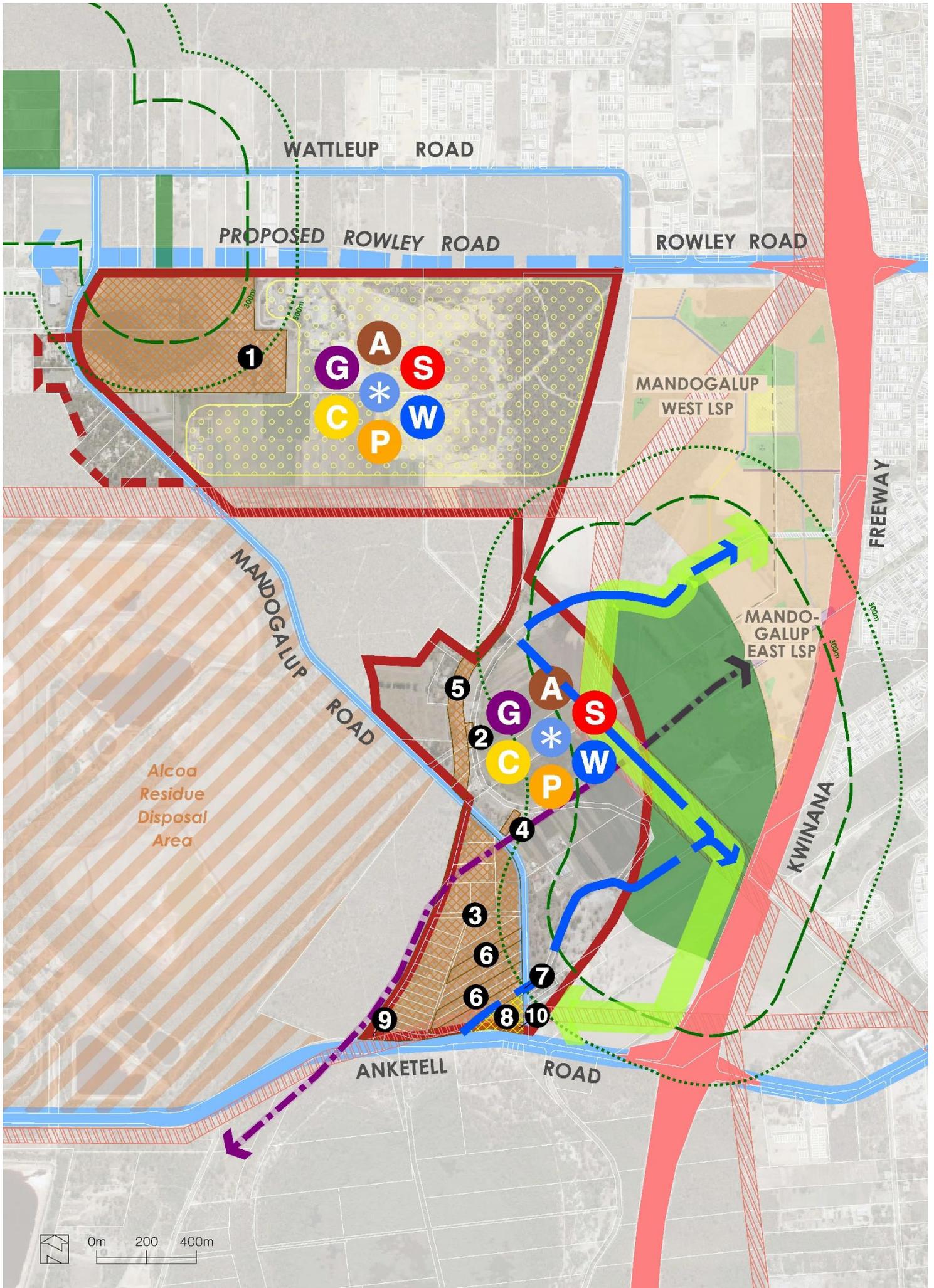


Figure 19: Opportunities and Issues - Land Use

6.3 Environment & Landscape

Environment and landscape opportunities and issues summarised in **Figure 20**, include:

- **Resource Enhancement Wetland** – in north-western portion of subject area to be retained with an appropriate buffer applied. Width of buffer to be determined by WAPC in consultation with the DBCA and the land owner / manager, may be 30-50m.
- **Vegetation** - development should be concentrated in areas which are mapped as “completely degraded” and “degraded”. Areas of vegetation which are of “good” quality or better, should be prioritised for retention, where possible.
- **Threatened Ecological Communities** – Consider retention of potential Banksia Woodlands and Tuart woodlands TECs.
- **Fauna** - Future development should avoid impacts to black cockatoo habitat including significant trees, particularly those with potentially suitable nesting hollows.
- **Bush Forever** – interface treatments to protect conservation areas from future development, and consideration to bushfire setback requirements from conservation areas.
- **Ecological Linkages** – Consider opportunity to retain Ecological linkage within and surrounding Bush Forever subject area 393, including REW and associated buffer. Alternative green links could be proposed where formal ecological linkages are not possible due to other constraints (e.g. bushfire).
- **Unsurveyed portions of the subject area and sandwich lots** - should be subject to a Spring flora and vegetation survey prior to clearing/ development to identify any conservation significant flora and vegetation. A targeted Winter survey would also be appropriate for any areas of habitat suitable for threatened *Drakaea* sp. Prior to any clearing or disturbance of vegetation/ trees, these areas should also be surveyed to determine any significance to black cockatoos.
- **Bushfire** – Separation to appropriate development required to achieve a BAL rating of BAL-29 or lower. Adequate water supply for firefighting purposes, appropriate vehicular access and egress required.
- **Dust** – Analysis of the information contained in DWER’s Dust Monitoring (LiDAR) report to help inform the Land Use Plan underpinning the proposed provisions of the Improvement Scheme will be undertaken.

LEGEND

-  Subject Area
-  Sandwich Lots

 **Vegetation** - “Good” quality or better vegetation should be prioritised for retention.

 **Threatened Ecological Communities** - Potential for Banksia woodlands and Tuart woodlands TECs to occur within the site. Further analysis required.

 **Fauna** - Avoid impacts to black cockatoo habitat including significant trees including potentially suitable nesting hollows.

 **Ecological Linkages** - Consider opportunity to retain Ecological linkages.

 **Resource Enhancement Wetland** - To be retained with an appropriate buffer applied.

 **Bushfire** - Separation to development required to achieve a BAL rating of BAL-29 or lower. Water supply for firefighting purposes, appropriate vehicular access and egress required.

 **Unsurveyed Portions** - Subject to a Spring flora and vegetation survey, and black cockatoo habitat survey prior to clearing/development.

  **Topography** - Careful consideration and regard to the existing landform.

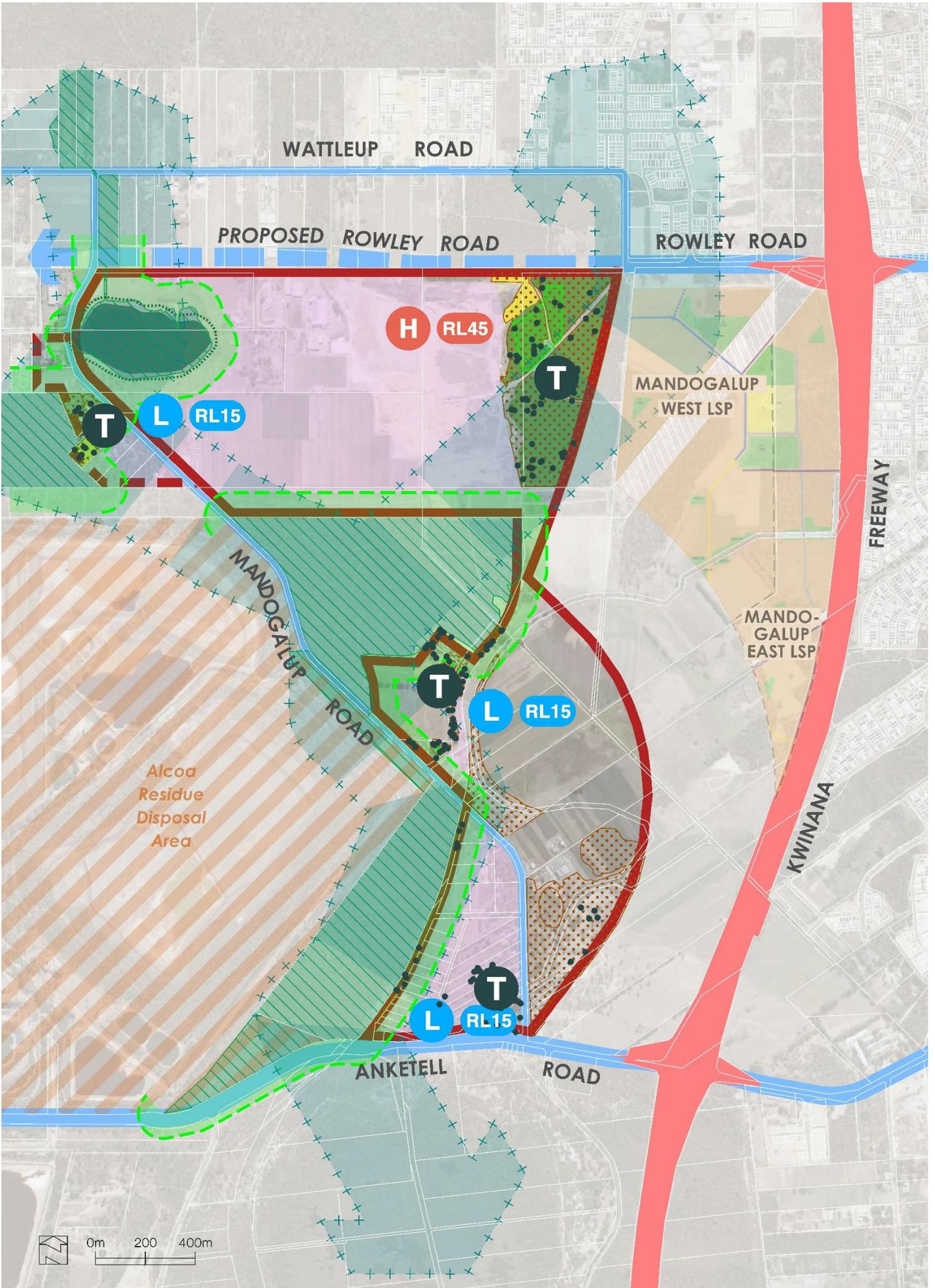


Figure 20: Opportunities and Issues - Public Realm

7.0 Additional Studies

Through the preparation of the technical reports, various additional studies have been identified, which are recommended to be undertaken in order to assist the preparation of the Improvement Scheme or future development of the subject. The additional studies, and recommended timing for the additional studies to be undertaken is identified in **Table 5** below.

Table 5 Additional Studies

Study	Recommended Timing (subject to discussion)	Subject to Separate Scope of Works
Environmental		
Acid Sulfate Soils - An Acid Sulphate Soil Investigation and Management Plan will be required prior to development.	Prior to Development	✓
Contamination - A preliminary subject area investigation is required prior to development to determine the extent of any contamination from existing of previously occurring land uses on the subject area, and the extent of any contamination from adjacent land uses.	Prior to Development	✓
Threatened Ecological Communities - Further statistical analysis, and assessments against diagnostic criteria are required to determine if Banksia Woodlands and Tuart woodlands TECs, do in fact occur within the subject area and sandwich lots.	Prior to Development	✓
Unsurveyed portions of the subject area and sandwich lots - should be subject to a Spring flora and vegetation survey prior to clearing/development to identify any conservation significant flora and vegetation. A targeted Winter survey would also be appropriate for any areas of habitat suitable for threatened <i>Drakaea</i> sp. Prior to any clearing or disturbance of vegetation/ trees, these areas should also be surveyed to determine any significance to black cockatoos.	Prior to Improvement Scheme ¹	
Black Cockatoo habitat – review of suitability of hollows for nesting in the 19 hollows identified in the survey of Lots 2 and 10 Rowley Road.	Prior to Development	✓
Wetland – Wetland and Wetland Buffer Management Strategy to determine suitable buffer	Prior to Development	✓
Noise Impact - Rowley Road and Hammond Road extensions – additional studies recommended to understand potential noise impacts from these roads, including associated Westport traffic.	Prior to Development, following Westport decision.	✓
Heritage		
Aboriginal Heritage - Any necessary future investigations regarding Aboriginal Heritage matters will follow the due diligence process.	Prior to Improvement Scheme	<i>Liaison with the DPLH included only, Aboriginal Heritage Survey would be subject to</i>

Study	Recommended Timing (subject to discussion)	Subject to Separate Scope of Works
		<i>separate Scope of Works</i>
European Heritage – consultation with the City to determine compatibility of land uses with heritage listed subject areas and to identify any development restrictions or opportunities.	Prior to Improvement Scheme	
Water Management		
Preparation of a Local Water Management Strategy (LWMS) for the Mandogalup development will be the responsibility of the landowner and should address key design objectives as identified in the DWMS. Including: Groundwater modelling should be undertaken to confirm maximum groundwater levels. The groundwater suitability for abstraction may need to be confirmed through water quality sampling, particularly noting the potential for contamination migration from Alcoa’s operations.	Structure Plan	✓
Transport		
Modelling outputs of the Westport project need to be considered and utilised in the assessment of the project. Once the Westport transport design is available, Transport Report is to be updated, and modelling outputs should be used as a base for assessing the land use options being considered in Mandogalup. This work would be undertaken in conjunction with Main Roads WA.	Prior to assessing Land Use Scenarios	
Examination of public transport connections to Aubin Grove with PTA once a road network has been determined.	Following selection of draft Land Use Plan	
Requirement for the civil engineers to look at the existing road reserve along Norkett Road (the Hammond Road extension) to understand how the road can avoid the bush forever subject area.	Prior to preparation of Land Use Scenarios	✓
Need to understand the staging delivery to facilitate changes to the road network and when connections are required to the Anketell Road or Rowley Road corridors	Following selection of draft Land Use Plan	
Servicing		
Wastewater – review wastewater servicing capacity once extent of the proposal has been developed.	Prior to Improvement Scheme	
Water – review water servicing capacity once extent of the proposal has been developed.	Prior to Improvement Scheme	
Electricity – review infrastructure capacity once extent of the proposal has been developed.	Prior to Improvement Scheme	
Telecommunications – review telecommunications infrastructure once extent of the proposal has been developed.	Prior to Improvement Scheme	

Study	Recommended Timing (subject to discussion)	Subject to Separate Scope of Works
Gas – review ability to service the subject area once the extent of the proposal has been developed.	Prior to Improvement Scheme	
Dampier to Bunbury Natural Gas Pipeline – Qualitative Risk Assessment to determine required setbacks and development controls or consider adjacent development to inform Improvement Scheme preparation associated with the Dampier to Bunbury Natural Gas Pipeline.	Prior to Improvement Scheme	✓ (Qualitative Risk Assessment)

Notes:

Environment consultant attempted to undertake Spring flora and vegetation survey across Subject Area, access was not available to all lots and therefore was not completed in Spring 2019.

DRAFT

8.0 Land Use Strategy

8.1 Existing Land Use Strategy

A summary of the existing Land Use Strategy is summarised in **Table 6** and outlined below.

The overarching existing Land Use Strategy is the SRPF, in which the subject area is identified as Industrial Investigation, and the sandwich lots are identified as Industrial Expansion. The classification of these areas is not to be construed as a commitment by the WAPC to support rezoning, rather, further detailed planning investigations to be undertaken prior to the consideration of rezoning under the MRS. The detailed planning investigations required to determine the appropriate Land Use Strategy for the subject area are being undertaken through the Improvement Plan process.

The subject area is defined by Improvement Plan 47, which enables the WAPC to undertake the necessary steps to advance the planning and development of the site, and enables the preparation of an Improvement Scheme. The Improvement Plan also sets out the objections for guiding the preparation of the Improvement Scheme.

The subject area is identified for various land uses within District structure plans including the JDSP, being identified as long-term Urban, and the ERIC, which shows a small portion of the subject area as Residential. However, both structure plans identify a dust buffer over the subject area, which requires monitoring to assess the risk of dust from the adjacent Alcoa subject area, and will determine the extent of any urban development. Similarly, the FRIARS recommend reviewing the buffer requirements for the Alcoa RDA to inform future uses at Mandogalup. It is acknowledged that although consideration of these structure plans is required, they are now superseded by the SRPF.

Table 6 Existing Land Use Strategy

Legislation, Policies and Documents	Relevance to Subject Area
State and Regional Planning Framework	
Metropolitan Region Scheme	Subject area predominantly zoned Rural 5.1744 ha zoned Urban Deferred
Improvement Plan No. 47	Encompasses subject area Enables the preparation of the Improvement Scheme
South Metropolitan Peel Sub-Regional Planning Framework (WAPC, 2018)	Subject area identified as Industrial Investigation area
Perth and Peel @ 3.5 million – The Transport Network (WAPC, 2018)	Identifies proposed extensions of Rowley and Anketell Roads east to the Kwinana Industrial Area, and upgraded to primary distributors. Rowley and Anketell Road form part of the Primary Freight network.
Review of the Kwinana Air Quality Buffer – Position Paper (WAPC, 2008)	Proposes an interim Kwinana Air Quality Buffer to be used to guide land use decisions on until the buffer is finalised.
Kwinana Industrial (including Air Quality) Buffer (WAPC, 2010)	Proposes 1km buffer and 0.5km non-residential transition zone.
Environmental Protection Authority Section 16e Advice (EPA, 2017)	Provides guidance on potential health and amenity impacts of dust in respect of potential urban development in the Mandogalup Area. This advice has been adopted and is now a position of government (Cabinet decision).

Legislation, Policies and Documents	Relevance to Subject Area
Local Planning Context	
City of Kwinana Local Planning Scheme No. 12 (City of Kwinana, 2019)	Subject area is predominantly zoned Rural A.
Local Planning Policies	
Local Planning Policy No. 12 Mandogalup Future Development	The City supports the continued operation, development and protection of industrial land uses within and adjacent to the Mandogalup Area and will not support development that has the potential to restrict or impinge upon the future growth of industry in the region.

8.2 Proposed Land Use Strategy

The proposed Land Use Strategy will be detailed in the Mandogalup Improvement Scheme and Land Use Plan, which will be developed as per the methodology detailed in **Section 1.0** of this report.

This report provides the relevant background to the Improvement Scheme including the subject area context, planning framework and relevant technical matters including traffic, services, environmental, bushfire, and land demand considerations and analysis. The report also provides an overview of the opportunities and constraints relevant to the subject area.

The findings in this report will be used to inform the community and stakeholder consultation, and the preparation of the various Land Use Scenarios. The various Land Use Scenarios will be presented to the WAPC, who will select a preferred Land Use Scenario. The agreed preferred Land Use Scenario will form the basis of a spatial plan, that shall form the Draft Land Use Plan.

This report, along with the technical appendices, will be updated following the selection of the preferred Land Use Scenario and preparation of the Draft Land Use Plan.

The Improvement Scheme will be prepared based on the Draft Land Use Plan, to facilitate the development of the subject area through:

- Establishing aims of the Scheme to facilitate the intended development;
- Establishing zones or precincts with associated land use permissibility;
- Providing land use and development guidance through scheme provisions and subject area and development requirements;
- Stipulating any environmental management requirements; and
- Providing for further planning instruments to guide decision making, including Improvement Scheme policies and local development plans.

APPENDIX A

Land Ownership Details

(Note: Appendix A removed from advertised documents due to confidentiality)



APPENDIX B

Environmental Assessment Report



APPENDIX C

District Water Management Strategy



APPENDIX D

Bushfire Management Plan



APPENDIX E

Land Supply and Demand Analysis



APPENDIX F

Transport Report



APPENDIX G

Infrastructure and Engineering Servicing Report



APPENDIX H

Transportation Noise Report

