



Development Services Attachments
ORDINARY COUNCIL MEETING
Wednesday, 19 July 2017

REPORT NUMBER	REPORT TITLE AND ATTACHMENT DESCRIPTION	PAGE NUMBER(S)
9.1.1	Draft Local Planning Strategy Review 1. Draft Local Planning Strategy Report 2. Draft Maps 3. Consultation Strategy	1 – 154
9.1.2	Retrospective Approval for Open Air Storage of Mining Equipment and Skip Bins: Lots 802 and 803 (3571) Great Northern Highway, Muchea (AMS) 1. Applicant's report 2. History of site 3. Correspondence from Department of Planning dated 2 December 2016 4. Submissions received 5. Examples of equipment and bins (photographs) 6. Aerial view	155 – 320
9.1.3	Proposed Extractive Industry for Sand: Lot 52 Old Gingin Road, Muchea 1. Applicant's Report 2. Bioscience report 3. Schedule of Submissions	321 – 358
9.1.4	Local Planning Scheme No.6: Developer Contributions 1. Background Information – report to Council from 2007 2. Shire consultant findings	359 – 386
9.1.5	Proposed Scheme Amendment No. 64: Rezone from 'Agricultural Resource' to 'Rural Smallholdings' – Lots 1 and 2 Teatree Road, Bindoon 1. Scheme Amendment document includes, but not limited to: (i) Locality Plan (ii) draft Structure Plan (iii) Flora and Fauna Survey (iv) Bushfire Management Plan 2. Schedule of Submissions	387 – 596
9.1.6	Section 70A Notification Authorisation: Freehold (Green Title) subdivision of Lot 65 Fewster Street, Muchea 1. Section 70A Notification Document 2. Deposited Plan	597 – 601

Shire of Chittering
LPS Review 2017



Shire of
Chittering

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Document Control

Version	Approved By – Name	Title / Resolution	Date
1.0			

TABLE OF CONTENTS

EXECUTIVE SUMMARY4
 Summary of Key Planning Issues and Implications 4
 Summary of Objectives, Strategies, Policies and Actions 9
PART ONE: STRATEGY26
 1. Introduction 26
 2. Vision and Strategic Direction..... 26
 3. Shire-Wide Strategy 28
 4. Precinct Strategies 43
 5. Implementation 47
 6. Monitoring and Review 50
PART TWO: BACKGROUND INFORMATION & ANALYSIS51
 1. Introduction 51
 2. State and Regional Planning Context..... 53
 3. Local Planning Context..... 59
 4. Local Profile 72
 5. Planning Issues and Implications 92
REFERENCES.....94
APPENDICES.....95

EXECUTIVE SUMMARY

The Shire of Chittering Local Planning Strategy outlines Council's vision for its local government area. It has been prepared to guide future land use planning and decision making, and provides the rationale for land use and development controls to be included in the Shire's local planning scheme. The local planning strategy comprises two parts:

Part One – Local Planning Strategy sets the vision and strategic directions for land use and development, and outlines the objectives, strategies, policies and actions required to achieve the Shire's vision.

Part Two – Background Information and Analysis includes detailed background information and analysis required to support the strategies and actions detailed in Part One.

Council's mission for its local planning strategy is to '**Conserve and Consolidate**'. That is, to 'conserve' its natural areas and rural character, and to 'consolidate' future development in areas where infrastructure and services are available.

The Strategy is focused on the southern portion of the Shire, however some of the broader strategic objectives will apply to the Wannamal townsite and northern portions of the Shire.

Summary of Key Planning Issues and Implications

The following key planning issues and their implications have been identified for the Shire of Chittering, and are explored in greater detail in Part Two.

Biodiversity conservation

The Shire is rich in biological diversity, containing habitat for rare and threatened species and communities. Less than 10% of the Shire's native vegetation is formally protected in conservation reserves. The Shire of Chittering Local Biodiversity Strategy, adopted by Council in 2010, identified areas of high conservation value and associated targets to increase protection. Some private properties containing high conservation value areas may be suitable for future zoning to Rural Conservation. Other areas may be a priority for acquisition by the State government, for the protection of nationally significant environmental values. Future development is to be located in existing cleared areas so as to ensure the retention of as much native vegetation as possible. Rural landholders may also choose to improve the protection and management of local natural areas on their properties through government-funded programs.

Landscape protection

The Shire's natural and rural character is highly valued by its community. View-sheds have been identified from important travel routes throughout the Shire, highlighting areas where future development could have significant visual impact. The newly defined view-sheds will replace the current Landscape Protection Special Control Area in the local planning scheme. Future proposals should be accompanied by visual impact assessment information, with consideration given to the siting and screening of developments that may be visible from travel routes.

This area comprises the land visible from the two most sensitive travel routes, Great Northern Highway and the Chittering tourist way, combined with the undulating landscape between. All planning proposals here are to be accompanied by an assessment of visual impacts undertaken in

accordance with State guidance. Outside of this area, visual impact assessment will be required for any future proposal that is likely to have a visual impact. Measures to mitigate impacts could include siting and screening of development to minimise visibility from roads.

Population and settlement

The Shire currently has three main population centres: Bindoon, Lower Chittering and Muchea. The Shire's population is projected to grow by up to 4.5% per annum, to 7,570 people by 2026. Most of the population growth can be accommodated within existing areas zoned for rural residential, residential and townsite purposes. Several sites have been identified as potentially suitable for rezoning to accommodate future housing, subject to more detailed planning. Planning is underway to establish a new residential area on Reserve Road, north of the Muchea Employment Node, subject to the provision of reticulated water by a private supplier. The majority of future housing will be focused in the Bindoon townsite, connected to essential infrastructure and services. It is expected that smaller residential lots will be developed to support the viability of infrastructure provision. Lower Chittering is anticipated to reach its capacity in the next 10 years for rural living development. The development of a village centre in Maryville will provide recreation, retail and tourism facilities in Lower Chittering. Ongoing upgrades to telecommunications infrastructure will support lifestyle and commercial activities within the Shire.

Ageing population

The Shire has an ageing community. A statistical analysis has found that 20% of the Shire's ageing population (over 65 years) is located in Bindoon. As a result there is a current shortfall in aged facilities and accommodation in the Shire. Bindoon town site has improved its facilities with the development of the Chittering Community Medical Centre and the intention is for Retirees WA to develop 65 aged accommodation and associated community facilities next to the medical centre. In addition to this, the strategy seeks to encourage aged persons accommodation and facilities to let the aged community retire and age within the Shire of Chittering. The Bindoon Townsite is the area identified as most appropriate for this as it has consolidated services and reduces the vulnerability of the possibility of bushfire impact.

Bushfire risk management

The Shire of Chittering has been declared Bushfire Prone. It is the Shire's position that planning and management of that risk for future developments is critical.

Biodiversity and bushfire management have both been identified as priorities for the Shire of Chittering and should retain synergies. The Shire of Chittering has recently endorsed a Bushfire Management Plan for the whole of the Scheme area which aligns with the Local Biodiversity Strategy.

There are some legacy zoned sites where yields may change in order to accommodate bushfire protection without impacting on native vegetation. Areas proposed for future zoning are located in areas that do not require clearing of native vegetation. The strategy proposes rounding off the rural residential area in Lower Chittering, which will improve access for emergency evacuation. Vulnerable uses such as schools, aged accommodation, and child care amongst others are to be located within existing townsites. Contributions towards fire-fighting infrastructure such as evacuation centres, community water tanks and fire-fighting equipment, could be considered for future development areas with bushfire risk.

Transport

Two major transport projects are underway in the Shire: North Link – Upgrade of highway from Morley to Muchea, with Stage 3 impacting the Shire (Ellenbrook to Muchea) and Great Northern Highway upgrade – Perth to Darwin (Muchea to Wubin). The North Link project will reduce travel time between the north-eastern metropolitan area and the Shire with an estimated travel time from Welshpool to Muchea to be twenty five minutes. This is expected to stimulate industrial development in the Muchea Employment Node. It is also anticipated that the reduced commute time will attract new residents looking for a tree-change from city living. The planned deviation of Great Northern Highway will define a new western boundary for residential development at Bindoon. Reduced freight trucks through Bindoon will support the development of a safer, more pedestrian-friendly town site. There is potential, however, that the highway deviation will negatively impact on local businesses in Bindoon. Accordingly a Bindoon Deviation Strategy has been prepared in an attempt to counteract some of the possible negative impacts on the Bindoon town site and to encourage a more improved town site for the future.

Water supply and sewerage

Most residents of the Shire, including some in Bindoon, are required to manage their own water supply and wastewater services, through rainwater tanks, bores and on-site effluent disposal.

Bindoon town site is the only area in the Shire with access to reticulated water. The Minister for Water has confirmed that an infill sewer programme has been approved for the Bindoon town site, this is estimated to be constructed in 2018 and will allow for a number of existing commercial and residential town site developments to connect.

The draft Government Sewerage Policy identifies parts of the Ellen Brook catchment as sewage sensitive area, which places restrictions on land use and servicing arrangements. In particular this affects the Muchea town site (Muchea study outcomes TBC). The provision of services in Muchea and Lower Chittering is dependent on alternative service providers as government agencies have been steadfast in denying services to these areas in the near future. This therefore limits the growth potential of the Shire. However, water services are/will be available in Bindoon and Reserve Road, therefore this Strategy focuses future development in these areas.

Rural land use

The Shire is predominantly rural, and with its proximity to the Perth metropolitan region, provides significant opportunities for agricultural production and value-adding.

The Shire is a productive and lively agricultural producer, with established citrus, poultry, horticulture and livestock industries. The strategy is focused from Bindoon south of the Shire as the North of Bindoon this strategy proposes to retain rural uses.

South of Bindoon, the strategy has to deal with a number of competing demands on rural land, including the industrialisation of rural land due to the insufficient industrial land within Chittering and its surrounds, encroachment of rural living developments and privatisation of water licenses resulting in a monopolisation of local water resources. This strategy seeks to refocus the use of rural land in accordance with SPP2.5 – Rural Planning - natural resource management & primary production, with other land uses in designated areas.

The Rural zone has the largest variety of land use permissibilities of all of the zones. The intention and focus for the Rural zone is to encourage a variety of land uses within the existing lot allocations such as tourism opportunities, agri-business and hobby farms, land uses and development where linked to, and compatible with, primary production, without requiring the fragmentation of agricultural land through subdivision.

Industrial land use

The Shire of Chittering historically has had no land allocated for industrial/light industrial land uses. As a result, rural land has been inappropriately used for industrial uses such as transport depots and warehouse/storage uses with or without the approval of the Shire. In 2011 the Department of Planning endorsed the Muchea Employment Node Structure Plan which covers approximately 1100ha of Agricultural Resource land in Lower Chittering/Muchea.

The Muchea Employment Node is separated from residential areas by 1km buffer. This provides a transition area, where rural land uses are compatible with residential. Detailed planning of the Muchea Employment Node is underway, with the northeast portion of the node set to be developed in the near future.

This strategy proposes an investigation into which land uses are appropriate. It further seeks to consolidate industrial uses in the Muchea Employment Node, thereby retaining rural land for Natural Resource Management and for primary production, and as a result achieving the Shire's objectives to retain natural landscapes and rural amenity.

There has been pressure for rural land to accommodate industrial land uses. This is historically due to the lack of industrial zoned land, where after the Shire would traditionally permit such uses on an ad-hoc basis. With the advent of the Muchea Employment Node, these uses are forthwith to be located within the Node.

Tourism and recreation

Tourism is a growing contributor to the Shire's local economy due to its picturesque natural landscape and its close proximity to the Perth Metropolitan Region.

Tourism has a significant potential role to play in the future economic development and growth of the Shire. The Shire is endowed with significant natural flora assets and a picturesque rural landscape that are highly valued by the community. The intention is to retain these aspects of the Shire that positively contribute to tourism and recreation. Whilst these significant features have been identified they have not been commercially leveraged off, and as a result tourism is not as evident as potential suggests.

The key intention of the strategy is to encourage supportive tourism uses within the rural zones and designated tourism town sites. Particular eco-tourism focused development and paddock to plate tourism will be the focus of this strategy.

Catchment management

The Shire contains a large portion of the Ellen Brook catchment and the Brockman Catchment, which are major contributors of nutrients to the Swan River, the protection of the Palusplain and Ellenbrook is a priority. It has been identified that the stocking of hooved animals has caused significant damage in parts of Lower Chittering and Muchea, the objectives of State Planning Policy

2.5 – Rural Planning (SPP 2.5) state that nutrient management should be encouraged in these sensitive areas.

An existing challenge exists around the Muchea town site area - a sewage sensitive locality – that has traditionally had a high water table. The impact of stock on soil, water and vegetation accordingly requires careful attention prior to. Keeping of stock needs to be restricted in sensitive catchments, in wetlands, in addition to this, the following should also be introduced / strengthened in the strategy.

Strengthen Special Control Areas (SCA) provisions regarding stocking rates and land uses that are detrimental to water quality. In these policy <SCA> areas, the keeping of stock is a discretionary land use.

Accordingly priority waterways have been identified in the Strategy for special consideration in future land use and development proposals.

Basic raw materials

The protection of basic raw materials ‘significant geological supplies’ is provided for under State Planning Policy 2.5 - Rural Planning.

Historically, land that had been previously extracted for BRM has not been rehabilitated resulting in large voids being left on agricultural land throughout the Shire. In addition to this, vegetation has been cleared for the purpose of BRM extraction. Since the previous strategy was developed, the Shire has implemented a Local Planning Policy – BRM and Local Law 2014, however, further controls and guidance to BRM extraction is required to prevent such extraction outcomes.

BRM extraction can be considered subject to impacts on natural areas, compatibility sensitive land uses and visual landscape impacts.

Mining

The Shire contains important geological resources – mineral sands on the coastal plain, and clay and bauxite on the darling scarp. These resources are important contributors to the Shire’s economy. Whilst mining is generally managed through the Mining Act the Shire of Chittering has a historical legacy applying to minerals excluding gold, silver and other precious metals that are located on privately owned land that was alienated from ownership of the Crown before 1899. This means that the control of mining this land falls under the jurisdiction of the Planning and Development Act 2005. The Local Planning Scheme 6 has Mining Industry as a prohibited use and Council has advised it intends on retaining this position into the future.

The Shire of Chittering has a general presumption against mining and oil and gas exploration within its boundaries or surrounds.

Summary of Objectives, Strategies, Policies and Actions

Part One of the Local Planning Strategy contains Shire-wide and precinct-based objectives, strategies, policies and actions. The Shire-wide themes relate to Natural Resource Management, Settlement, Infrastructure, and Economy. Planning precincts have been identified around Bindoon townsite, Lower Chittering, Reserve Road, Muchea Employment Node, and Muchea townsite.

The following table summarising objectives, strategies, policies and actions also provides references to the relevant sections of the local planning strategy text.

Objectives	Strategies	Policies and Actions	Reference
A. Natural Resource Management			
1. Biodiversity conservation			3.1.1 /
1.1 Formally protect high conservation value areas	a. Implement the Shire’s Local Biodiversity Strategy, including formal protection of high conservation value areas on public and private land, as shown on the Local Planning Strategy Map (Figure 1)	<ul style="list-style-type: none"> i. Reserves containing high conservation value areas (Figures 1 & 8) are to be reclassified specifically for conservation purposes in the local planning scheme and reserve management orders ii. Ensure the formal protection of high conservation value areas on land identified for Rural Conservation on the Local Planning Strategy Map (Figure 1) through conservation covenants and other mechanisms iii. Proposals for land containing ‘high conservation value areas are to demonstrate implementation of protection targets contained in the Shire’s Local Biodiversity Strategy – Appendix 5 iv. Any planning proposal affecting native vegetation is to be assessed against the precinct’s retention and protection targets contained in the Shire’s Local Biodiversity Strategy – Appendix 5 v. Support State government acquisition of properties containing ‘high conservation value areas’ for future incorporation into conservation reserves vi. Provide information to landowners regarding opportunities to protect and 	

Objectives	Strategies	Policies and Actions	Reference
		manage 'high conservation value areas' on private land, such as conservation covenants and Land for Wildlife vii. Consider introducing programs for rate rebates and grants to support the voluntary protection and management of 'high conservation value areas' on private land	
	b. Protect high conservation value areas from basic raw materials extraction	i. Within 'high conservation value areas', planning applications for basic raw materials extraction (including 'State Geological Supplies') will not be supported ii. Explore opportunities for formal protection of 'high conservation value areas' when considering applications for basic raw materials extraction on adjoining cleared land	
1.2 Support the conservation of threatened species and communities	a. Retain and protect habitat for threatened species and/or communities	i. Any planning proposal affecting any native vegetation is to be accompanied by information from vegetation, flora, fauna and habitat surveys undertaken in accordance with Federal and State policy guidance ii. Apply formal mechanisms for the retention and protection of threatened ecological communities and/or threatened species habitat wherever possible in future planning and decision making iii. Habitat retention and protection requirements are to be determined at rezoning, or at the next stage of planning if land is already zoned for development	
1.3 Retain the Shire's natural character and sense of place	a. Maximise the retention of native vegetation across the Shire	i. Future development is to be located in existing cleared areas to ensure the retention of as much native vegetation as possible ii. Proposals to rezone vegetated areas for future development will not be supported iii. Structure plans, subdivision and development applications are to address native vegetation	



Objectives	Strategies	Policies and Actions	Reference
		<p>retention for biodiversity conservation and amenity, including retention of individual trees</p> <p>iv. Clustered style developments in existing developed areas are preferable</p>	
2. Visual landscape protection			3.1.2 /
2.1 Protect valued visual landscape character	a. Protect rural and natural landscape character along important travel routes	<p>i. Within mapped 'road view sheds' and the 'Lower Chittering hills' (Figure 12), development is to be avoided if it will either be visible or will dominate the landscape, depending on the type of development and the sensitivity of the location</p> <p>ii. Planning and development proposals are to be accompanied by information on potential visual impacts, assessed in accordance with State guidance</p> <p>iii. Amend local planning scheme provisions for visual landscape protection, including deletion of the Landscape Protection Special Control Area and introduction of new controls including permissibility of non-agricultural uses, requirements for roadside screen planting, and avoidance of sensitive locations such as the skyline, ridgelines, ridge sides and high points</p> <p>iv. Prepare a local planning policy to provide guidance on location, siting and design, including mechanisms such as setbacks, screen planting, to protect rural landscape character</p>	
2.2 Maintain rural amenity	a. Protect amenity for rural residents	<p>i. Outside of highlighted areas on the Landscape Protection Map (Figure 12), rural character and amenity for non-agricultural uses are to be maintained</p> <p>ii. Scheme controls will continue to be supported, where they aim to protect rural amenity from undue noise, dust, commercial vehicle parking and movement etc.</p>	
3. Bushfire risk management			3.1.3 /

Objectives	Strategies	Policies and Actions	Reference
3.1 Avoid development in areas of extreme bushfire hazard	a. Amendments to rezone land for development in areas of native vegetation will not be considered	i. Rezoning for development will be considered only for areas shown on the Local Planning Strategy Map (Figure 1) and highlighted on the Bushfire Risk Management Map (Figure 13)	
	b. Ensure proposals for development within the Shire's bushfire prone area comply with State legislation and policy	i. Remove local planning scheme provisions that duplicate Schedule 2 Part 10A provisions of the planning regulations ii. Planning and development proposals are to be accompanied by appropriate information addressing bushfire hazard and mitigation in accordance with SPP 3.7 & guidelines	
	c. Vulnerable land uses are to be located within appropriately managed areas	i. Amend the zoning table in the local planning scheme to exclude 'Family Day-care' from all zones except Townsite, Residential R2 and Rural Residential and list as an 'A' use	
3.2 Utilise bushfire mitigation measures that do not require the clearing of native vegetation	a. On land zoned for rural living or residential purposes, lot yield and layout are to reflect bushfire risks	ii. Subdivision design is to respond to site conditions, with future development located within existing cleared areas and bushfire mitigation measures to avoid impacts on native vegetation iii. In areas identified for future development on the Local Planning Strategy Map (Figure 1) and highlighted on the Bushfire Risk Management Map (Figure 13), a smaller minimum lot size than reflected in the scheme may be considered, in order to maximise vegetation retention and better design outcomes. iv. Strategic fire breaks intended for secondary emergency access and egress are to be developed to a constructed trafficable standard for 2WD.	
3.3 Improve bushfire management infrastructure	a. Improve access and water supply arrangements to assist fire-fighting operations	i. When rezoning and subdivision occurs, implement mechanisms to improve access and egress to existing rural living and residential areas on adjoining land, as highlighted on the Bushfire Risk Management Map (Figure 13)	



Objectives	Strategies	Policies and Actions	Reference
		ii. Identify opportunities for development contributions towards upgrades and provision of bushfire management infrastructure when scheme amendments, structure plans and subdivisions are considered	
4. Rural land use			3.1.4 /
4.1 Support the sustainable development of rural land for a range of uses	a. Clarify land use and development opportunities for rural land	i. Normalise the Agricultural Resource zone in the scheme to reflect the model provisions in the Local Planning Scheme Regulations ii. Normalise the Rural Retreat and Rural Smallholdings zones in the scheme to reflect the model Rural Smallholdings zone provisions in the Local Planning Scheme Regulations iii. Introduce Rural Home Business as a permissible land use within the Rural zone iv. Amend the zoning table in the local planning scheme to permit rural pursuits in the rural zone and change the permissibility of Cemetery land use in the rural zone from 'P' to 'A'	
4.2 Prevent the fragmentation and/or loss of agricultural land	a. Limit further subdivision of rural land	i. Subdivision of land to facilitate intensive agriculture is not to be supported, due to the existing number of smaller rural lots in the Shire ii. Rezoning of rural land for Rural Residential or Residential development will be considered only for areas shown on the Local Planning Strategy Map (Figure 1) iii. Proposals to rezone Rural Smallholdings zoned land to Rural Residential or Residential will only be considered for areas close to existing settlement, serviced by reticulated water and sewerage, and capable of sustaining more intensive development without adversely affecting the natural environment or amenity iv. Ensure appropriate buffers are maintained between rural and	

Objectives	Strategies	Policies and Actions	Reference
		residential areas, in order to support the continuation of important agricultural land uses	
4.3 Support sustainable agricultural land management	a. Promote improved agricultural practices to reduce nutrient export and land degradation	<ul style="list-style-type: none"> i. Amend the local planning scheme to include reference to land capability and the stocking rates in accordance with State policy and guidelines, particularly along priority waterways and within sensitive catchment areas ii. Amend the local planning scheme to control the keeping of stock, including changing rural pursuits to a 'D' use in the rural zone. iii. Proposals for intensive agriculture are to be supported by advice from the State department responsible for agriculture iv. Implement recommendations of the Ellen Brook Catchment Water Quality Improvement Plan (September 2009) and the Muchea Townsite Groundwater and Soil Assessment project (under preparation) v. When assessing proposals, consideration is to be given to soil, landform, slope, vegetation cover, waterways and impact on stormwater drainage networks vi. The use of appropriate stock fencing is to be mandated where vegetation is to be retained and/or protected vii. Support rural landholders with sustainable land management practices including but not limited to; fencing, native revegetation, appropriate stocking, land remediation, bushfire management, etc. 	
4.4 Avoid industrialisation of rural land	<ul style="list-style-type: none"> a. Focus industrial uses in appropriate areas b. Provide opportunities for living and working on the same property that combine light industry and housing, provided they are carefully 	<ul style="list-style-type: none"> i. Avoid industrial sprawl along the highway, and locate these in unobtrusive nodes or other sites where they can be screened from view ii. Industrial land uses are to focused within the appropriately zoned 	

Objectives	Strategies	Policies and Actions	Reference
	<p>planned; in general proximity to urban areas; serviced; and have design features that address buffers and amenity</p>	<p>Mucea Employment Node</p> <p>iii. Outside of the Mucea Employment Node, industrial land uses are not considered appropriate within the ‘road view sheds’ or ‘Lower Chittering hills’ (Figure 12)</p> <p>iv. Amend the local planning scheme to change the permissibility of transport depots to an ‘X’ use</p> <p>v. Amend Local Planning Scheme to rezone Tronox – Lot M1261 (722) Brand Highway, Mucea.</p> <p>vi. Introduce rural enterprise zone into the local planning scheme</p> <p>vii. Identify suitable sites for possible rural enterprise zones</p>	
<p>4.5 Support the diversification of land uses within the rural zone</p>	<p>a. Encourage activation of the rural zone</p> <p>b. Support tourism that is complimentary to the agricultural use and natural character of rural land</p>	<p>i. Future development is to be incidental to the agricultural intent and natural character of the rural zone</p> <p>ii. Progress amendments to the local planning scheme to support tourism and agribusiness uses within the Rural and Rural Smallholdings zones</p> <p>iii. Encourage tourism and related land uses (such as art and craft centre, market, reception centre, restaurant, tourism accommodation, winery/brewery) on properties with established agricultural enterprises</p> <p>iv. Support tourism development and ‘paddock to plate’ initiatives in appropriate locations along Great Northern Highway, the Chittering Valley Tourist Way, within the ‘Lower Chittering hills’ (Figure 12) and near Bindoon townsite</p>	
<p>5. Catchment management</p>			<p>3.1.5 /</p>
<p>5.1 Improve the health of priority catchments</p>	<p>a. Protect priority waterways and wetlands</p> <p>b. Manage nutrient export and land degradation</p> <p>c.</p>	<p>i. Ensure appropriate setbacks of development from waterways based on site-specific assessments</p> <p>ii. Manage stocking of land in accordance with State policy and guidelines</p> <p>iii. Strengthen and consolidate scheme provisions of the Ellen</p>	

Objectives	Strategies	Policies and Actions	Reference
		Brook Palusplain SCA by; <ul style="list-style-type: none"> iv. making single houses discretionary and Agriculture – Extensive is to be a Discretionary Use for which a DA is required and developments may only be approved where it can be demonstrated to not add to nutrient load in the catchment. v. Improvements to existing land use/development when opportunities arise. vi. Review Local Planning Policy LPP 2 – Muchea Townsite to strengthen requirement for no septic tanks in Muchea Townsite and surrounds. vii. Encourage innovative design for stormwater management in accordance with State guidelines. viii. Encourage developers to construct vegetated swales aka ‘living streams’ in areas affected by the Floodplain and Palusplain. ix. Consideration to be given to a waterways reserve network. x. Consideration for the review and land use provisions around development around the Palusplain. xi. Implement the Muchea study, MENSP & WQIP. 	
6. Basic raw materials, minerals and petroleum			3.1.6 /
6.1 Provide for the extraction of significant basic raw materials and mining	a. Protect ‘significant geological supplies’ (SGS)	<ul style="list-style-type: none"> i. Protect SGS areas identified on the Local Planning Strategy Map (Figure 1) and Basic Raw Materials Map (Figure 11) unless technical information demonstrates that the resource is not of significant quality ii. In the local planning scheme, delete the existing SCA and Introduce new scheme controls for SGS areas that make reference to the Local Planning Strategy Map and allow for the extraction of the 	

Objectives	Strategies	Policies and Actions	Reference
		<p>resource prior to other development occurring</p> <p>iii. Consider appropriate land uses within designated buffers to SGS areas Protect SGS areas identified on the Local Planning Strategy Map (Figure 1) and Basic Raw Materials Map (Figure 11) unless technical information demonstrates that the resource is not of significant quality</p> <p>iv. In the local planning scheme, delete the existing SCA and Introduce new scheme controls for SGS areas that make reference to the Local Planning Strategy Map and allow for the extraction of the resource prior to other development occurring</p> <p>v. Consider appropriate land uses within designated buffers to SGS areas</p>	
<p>6.2 Manage impacts of basic raw materials extraction and mining on the Shire’s natural and rural character</p>	<p>a. Avoid impacts of basic raw materials extraction on natural areas</p> <p>b. Minimise the visual impacts of basic raw materials extraction</p>	<p>i. Planning applications for basic raw materials extraction and associated infrastructure will not be supported in areas affecting native vegetation, wetlands or waterways</p> <p>ii. Outside of SGS areas, basic raw materials extraction and associated infrastructure is not to be visually prominent from road view sheds or the ‘Lower Chittering hills’ (Figure 12</p> <ul style="list-style-type: none"> •) , near Bindoon townsite, or other sensitive locations as identified by Council 	
<p>7. Mining /Natural Resources</p>			
<p>7.1 Exclude mining, natural resource extraction/exploration activities within the Shire that are under</p>	<p>a. There is a general presumption against mining and natural resources extraction within the Shire</p>	<p>i. Develop a strategy to deal with mining and oil and gas applications and exploration within the Shire of Chittering.</p>	

Objectives	Strategies	Policies and Actions	Reference
<p>the control of the <i>Planning Development Act 2005</i></p> <p>7.2 Provide comment/local guidance on all proposed extraction/exploration applications within the Shire of Chittering.</p>		<p>ii. Continue to support the 'X' use of Industry – Mining within the local planning scheme</p>	

B. Settlement			
1. Townsites			
<p>1.1 Focus residential development in areas with essential infrastructure and access to community facilities and services</p>	<p>a. Focus growth in Bindoon as the primary town centre in the Shire</p> <p>b. Limit development within Muchea townsite until reticulated water and sewerage services become available</p> <p>c. Support provision of reticulated water by private licensed water suppliers in areas not serviced by Water Corp</p>	<p>i. incentivise intensification of development within the 'Bindoon water supply area' as shown on the Local Planning Strategy Map (Figure 1)</p> <p>ii. Progress structure planning, subdivision and development of existing Townsite zoned land within Bindoon.</p> <p>iii. Support rezoning of additional land to Bindoon Townsite as shown on the Local Planning Strategy Map (Figure 1), to extend the residential area within Water Corp water supply area</p> <p>iv. Council to provide incentives to facilitate connection of properties to reticulated sewerage within Bindoon via the STED program</p> <p>v. Undertake investigations to identify opportunities for serviceable development within the Muchea townsite</p> <p>vi. Seek State government support for the provision of water and sewerage infrastructure to developed areas of Muchea townsite</p> <p>vii. Undertake a review of the Muchea Townsite Local Planning Policy.</p>	

<p>1.3 Provide a range of housing options suitable for the expected demographic changes</p>	<ul style="list-style-type: none"> a. provide smaller/higher density residential lots to accommodate smaller households and lower maintenance b. provide aged care housing to accommodate older residents c. State housing 	<ul style="list-style-type: none"> i. on eastern side of Bindoon townsite where the scheme allows for R10/30, proactively seek connection to sewer to achieve higher density ii. progress preparation of a structure plan to provide aged care housing iii. work with the agency responsible for social housing to improve the supply in the Bindoon townsite 	
<p>1.4 Improve connectivity of the Bindoon townsite</p>	<ul style="list-style-type: none"> a. Improve connection between west and east sides of Bindoon townsite b. GNH deviation to act as western boundary of Bindoon townsite 	<ul style="list-style-type: none"> i. prepare a master plan for the Bindoon townsite which addresses improved pedestrian connections and streetscape following the highway deviation ii. when considering planning applications, consideration must be given to the potential impact (location, visual, noise) of the proposed road alignment 	
<p>1.5 Retain amenity for townsite residents</p>	<ul style="list-style-type: none"> a. infrastructure and service providers to consider the visual noise and odor impacts on townsite residents 	<ul style="list-style-type: none"> i. proposals for new infrastructure by water Corp, Main Roads and other service providers (e.g. waste) to ensure amenity impacts are taken into consideration 	
<p>2. New residential</p>			
<p>2.1 Limit future residential development to areas that have access to essential infrastructure and community facilities and services</p>	<ul style="list-style-type: none"> a. provide serviced development in the Reserve Road precinct b. new residential areas to reflect the Shire’s sense of place through design guidelines c. in new residential areas, provide community, recreational facilities and opportunities for the development of small-scale commercial/service businesses in the future 	<ul style="list-style-type: none"> i. where essential infrastructure and services can be provided, proposals for new residential development of will be supported ii. low density rural living proposals in areas that can be serviced will not be supported iii. provide reticulated water services within the Reserve Road precinct iv. only when infrastructure services can be extended from Reserve Road, adjoining lots x and y may be considered for future Residential zoning 	
<p>2.2 Provide a high level of amenity in new residential areas</p>	<ul style="list-style-type: none"> a. Develop local strategies and policies for new residential areas. 	<ul style="list-style-type: none"> i. Ensure that new developments are R-coded to ensure the highest standard of 	



		<p>development is statutorily required.</p> <p>ii. Prepare Design guidelines for subdivision to set street scaping and development requirements.</p>	
3. Rural living			
3.1 Consolidate rural living development to existing precincts	<p>a. rezoning and subdivision of rural land for rural residential purposes will only be supported in areas defined on LPS map</p> <p>b. Ensure new development contributes to the desired strategic road network</p> <p>c. all new development is to be accommodated on existing cleared land and not impact on bushland</p> <p>d. encourage creative road layouts to support community bushfire safety</p>	<p>i. See Figure 1.No re-subdivision of lots unless identified on LPS map.</p> <p>ii. Introduce Rural Residential schedule to scheme – specific provisions relating to vegetation, visual landscape, bushfire etc.</p> <p>iii. See Figures 13 & Transport</p> <p>iv. See Figure 13</p> <p>v. See Figure 13</p>	
3.2 Rural living development to respond to the natural and landscape values	<p>a. Lot yield and layout to accommodate existing vegetation, habitat, waterways, landform and rural character all future subdivision and development of RR zoned land is to avoid impact on native vegetation including habitat trees for Carnaby's cockatoo</p>	<p>i. Structure planning will be required for Buckthorn etc. to demonstrate how this is to be achieved</p>	
3.3 Provide for limited RL development where there is significant conservation benefit	<p>a. a rural conservation zoning will be contemplated where environmental benefit can be demonstrated</p>	<p>i. consider RC for lots designated on the strategy map and mechanisms for ongoing protection through conservation covenants et al.</p>	
3.4 Improve amenity in rural living areas	<p>a. Plan for district level activity recreation community facilities</p> <p>b. Allow for Rural Living where it can be demonstrated that critical links can be made between new and existing subdivisions to</p>	<p>i. Allow for the development of a district recreational facility in Maryville, Lower Chittering provide for the development of an activity centre in Maryville, Lower Chittering</p>	



	improve bushfire safety. Note this cannot result in extensive clearing.		
3.5 New rural living development to be serviced	a. Lot sizes to respond to the need for connection to reticulated water services	i. Lots identified for future Rural Living Development potential can only go down to 1 hectare in size if they are serviced by water.	

C. Infrastructure

1. Transport

1.1 Leverage opportunities from improved network access to metropolitan centres	<ul style="list-style-type: none"> a. Provide a focus for freight and logistic based industries at MEN b. North Link 	<ul style="list-style-type: none"> i. Facilitate structure planning and associated studies to support land release in MEN ii. Develop a Local Planning Policy which focuses on Design Guidelines to help manage the impact of the Highway on agricultural land abutting the Highway. 	
1.2	a. Minimal noise and visual impacts of GNH Bindoon deviation on existing and future residents	i. SPP 5.4 + guideline: noise wall and screen planting	

2. Water supply and sewerage

2.1 In non-residential areas, ensure appropriate servicing	<ul style="list-style-type: none"> a. Industrial land use b. Serviced new development commensurate with intended land use and in context of environmental conditions 	<ul style="list-style-type: none"> i. Ensure that adequate provision is made for wastewater disposal, stormwater management and drainage, water supply ii. Ensure that proposals take account of impacts on biodiversity, groundwater, and surface water. iii. Identify on the Local Planning Strategy maps the location of all approved and registered waste disposal sites in the Shire including the location and extent of the Department of Environment and Conservation's recommended odour buffers. iv. Identify the location of all approved and registered waste disposal sites in the Shire and classify them 'Public Purpose' Reserve in Local Planning Scheme No.6. 	
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In residential areas	<ul style="list-style-type: none"> a. Require high quality development in accordance with Department of Water requirements for Better Urban Water Management. 	<ul style="list-style-type: none"> i. Implementation of Better Urban Water Management, including preparation of UWMP. 	
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D. Economy

1. Industrial land use

1.1 Facilitate development of Muchea Employment Node	<ul style="list-style-type: none"> a. Provide for industrial land uses at Muchea Employment Node b. support the use and development of land at MEN for industrial purposes c. concentrate transport, storage and other related industries in the MEN d. avoid ad-hoc industrial development outside MEN 	<ul style="list-style-type: none"> i. amend the local planning scheme to differentiate between the general and light industrial zones ii. investigate potential for pre-funding and/or cost-sharing arrangements for road construction and other infrastructure iii. amend the scheme to prohibit transport depots, warehouse/storage in the rural zone, unless associated with a primary production industry 	
1.2 Recognise strategic land uses	<ul style="list-style-type: none"> a. appropriately zone and buffer important land uses 	<ul style="list-style-type: none"> i. Consider nominal buffers (MAP x) when assessing proposals 	

2. Tourism Land uses

2.1 Provide expanded opportunities for tourism within the Shire	<ul style="list-style-type: none"> a. Encourage ancillary tourist uses within Rural zone (e.g. chalets, hobby wineries, farmers markets etc.) b. Develop a strategy for identifying and improving the visibility of valued landscape features and areas (e.g. through roadside pullover bays along newtown roads, picnic areas, walk trails) c. roads, picnic areas, walk trails) 	<ul style="list-style-type: none"> i. Plan for development, promotion and sustainable management of trails – drive, cycle, bridle, and hike (in accordance with the Trails Network Masterplan. ii. support tourist developments that are suitable for the setting and take account of bushfire risks, servicing and environmental conditions iii. Improved access and facilities at Chittering Lakes iv. Establish linkages between tourism in the Shire and outside v. Plan for a future caravan park in Bindoon to service travelers along Great Northern Highway vi. Encourage popup and wayside stalls in Tourism Precincts (Bindoon and Lower Chittering 	
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		<p>townsites)</p> <p>vii. Develop incentives to encourage nature based 'Eco-Tourism' uses in the Shire. (May require scheme amendment).</p>	
2.2 Recreation	<p>a. Improve access to active and passive recreation facilities for local residents and visitors</p>	<p>i. Plan for the provision of community recreation and tourism facilities with small scale commercial at Maryville village centre (shown on Map)</p> <p>ii. Expand recreational facilities in NE of Muchea townsite</p> <p>iii. Plan for the provision of district level community and recreation facilities in the Reserve Road precinct.</p> <p>iv. Provide active recreation options on establishes Shire reserves.</p> <p>v. Encourage precinct activation through green linkages footpaths, street activation etc.</p>	

E. Planning Precincts

1. Bindoon

<p>Develop Bindoon as the primary population centre in the Shire</p>	<p>a. Facilitate subdivision and development of land currently zoned Townsite</p> <p>b. Support zoning of additional land for residential purposes within the Water Corporation's water supply area</p> <p>c. Incentivise activation of vacant buildings and spaces in Binda Place.</p> <p>d. Increase density within appropriately serviced townsite lots</p> <p>e. Tourism</p> <p>f. Encourage mixed housing types to accommodate state housing and aged accommodation.</p>	<p>i. Support higher density development and possible Subdivision of R30 once STED is connected</p> <p>ii. Encourage mixed use sites in Binda Place</p> <p>iii. Support the development of a Caravan Park in Bindoon Town Centre.</p> <p>iv. Treat the Bindoon Bypass as the new western boundary to Bindoon townsite.</p> <p>v. Encourage aged care development on lot 88 Woolah Rise, Bindoon.</p> <p>vi. Develop a masterplan for Binda Place</p> <p>vii. Develop Design Guidelines built form within Binda Place</p> <p>viii. Develop design guidelines for residential development within Bindoon Vista subdivision.</p> <p>ix. Apply actions and intent of the Bindoon deviation strategy.</p>	
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2. Lower Chittering			
<p>Limit additional un-serviced rural living development in Lower Chittering</p>	<ul style="list-style-type: none"> a. Investigate options for future expansion of the catholic school within the Maryville village centre, including land swaps b. Provide facilities and services for residents and visitors in Lower Chittering e.g. community centre, convenience store c. Improve community activity within Lower Chittering. 	<ul style="list-style-type: none"> i. Explore land swap opportunities with the school site in Lower Chittering, with portion of the public open space to be used for a multi user facility for recreational purposes. ii. Provide for future rural residential development in appropriate places in accordance with the strategy map iii. Prepare a structure plan for the proposed Maryville Village centre iv. Encourage space and plan activation in Maryville. v. Amend the scheme to allow for a variety of home businesses utilising the National Broadband Network. vi. Encourage landholders with development potential to improve access/egress to existing subdivision configurations. vii. Consider relocating the special use site intended for commercial development to support the Maryville development to face Chittering Valley Way. viii. Discourage any development proposals which may have a negative veiwshe on Lower Chittering Hills. 	
3. Reserve Road			
<p>Support future serviced residential development and associated facilities along Reserve Road</p>	<ul style="list-style-type: none"> • Support provision of reticulated water by a private supplier • Potential extension of Residential area northward following development of Lot 2 Reserve Rd – rezoning from Rural Residential to Residential subject to water provision and protection of native vegetation • Plan for provision of additional community facilities & services for the future population 	<ul style="list-style-type: none"> i. Encourage high quality private infrastructure ii. Appropriate linkages with existing subdivisions iii. Design Guidelines for future development of Reserve Road, including nature strip planting, built form and human and property safety. iv. Ensure all future development is appropriately serviced. v. Potential extension of Residential area northward following development of Lot 2 Reserve Rd – rezoning from Rural Residential to Residential subject to water 	



	within Reserve Road precinct	provision and protection of native vegetation	
4. Muchea Employment Node			
Facilitate industrial development within the Employment Node Protect the rural amenity and environmental sensitivities currently existing within the Muchea Employment Node.	a. Support structure plans that are consistent with MENSPP (WAPC) Support landowners with the preparation of local structure plans in accordance with the MENSPP	<ul style="list-style-type: none"> i. Alternative service areas i. Investigate pre-funding road construction i. Investigate options for trunk infrastructure to support within entirety of MEN v. Allow for incidental uses to support the industrial hub, including food and essential services with a human interface. v. Encourage all future industrial development to be located within the Muchea Employment Node. 	
5. Muchea			
Restrict land use and development in sensitive areas of Muchea townsite. Maintain Muchea as a contained village fostering a rural community lifestyle in a healthy environment	a. Future growth and development to be guided by appropriate studies.	<ul style="list-style-type: none"> i. Depending on results of the study, consider changing of zoning in response to environmental and public health conditions. ii. Group dwellings to not be permitted in scheme for Muchea townsite. Muchea townsite (Amd TPS6) iii. Improved connection across Brand Highway between townsite (west) and retail (east) Improve existing community facilities located in Muchea. 	

PART ONE: STRATEGY

Introduction

The Shire of Chittering Local Planning Strategy outlines Council's vision for its local government area. It has been prepared to guide land use planning and decision making, providing the rationale for zoning and land use and development controls to be included in the Shire's local planning scheme. The local planning strategy focuses on the developed southern half of the Shire, from approximately Mooliabeenee Road. North of this road, the Shire is predominantly agricultural, and no changes are proposed for the Wannamal townsite.

Part One (this part) of the local planning strategy sets the vision and strategic directions for land use and development, and outlines the objectives, strategies and actions required to achieve the vision. Part Two of the local planning strategy contains detailed background information and analysis to support the objectives, strategies and actions in Part One.

Local planning strategies are provided for under Part 3 of the Planning and Development (Local Planning Schemes) Regulations 2015 (the Planning Regulations). In accordance with Regulation 11 clause 2, a local planning strategy must:

- (a) Set out the long-term planning directions for the local government;
- (b) Apply any State or regional planning policy that is relevant to the strategy; and
- (c) Provide the rationale for any zoning or classification of land under the local planning scheme.

Vision and Strategic Direction

The vision and strategic directions for the Local Planning Strategy have been adopted from the 2016 review of the Shire of Chittering's Strategic Community Plan. The Strategic Plan sets out the vision and aspirations for the local community and has been developed to guide Council decisions.

The vision for the Shire of Chittering is:

'Living, working and playing in our friendly, thriving, diverse and well-connected community, in harmony with our natural environment.'

In order to achieve this vision, Council is committed to a number of strategic directions linked to the outcome areas of Our Community, Natural Environment, Built Environment, Economic Growth, and Strong Leadership. The Strategic Community Plan outcome areas and strategic directions, and the corresponding sections in the local planning strategy, are provided in Table 1.

Council's mission for its local planning strategy is to 'Conserve and Consolidate'. That is, to 'conserve' its natural areas and rural character, and to 'consolidate' future development in areas where infrastructure and services are available.

Table 1: Relationship between the Strategic Community Plan and this Local Planning Strategy

Strategic Community Plan - outcome areas and strategic directions	Local Planning Strategy
1. Our Community: ‘An inclusive, active, safe and healthy community for all to enjoy.’	Planning Precincts
1.1 Active and supported community - Our communities will have services and facilities within their local community hubs. 1.2 Strong sense of community - Our communities will be cohesive and connected through engagement, interaction and participation. 1.3 Safe and healthy community - Our future generations will be healthy and feel safe in their community.	Bindoon Lower Chittering Reserve Road Employment Node Muchea
2. Natural Environment: ‘A protected and bio-diverse environment, which the community and tourists enjoy in a well-managed, respectful manner.’	Natural Resource Management
2.1 Protected environment - Our local diversity will be valued, protected and promoted as unique and valuable. 2.2 Sustainable resources - Energy and water are valued with a focus on improved water and energy use. - Waste is reduced and valued through recycling and reuse. 2.3 Protection of life and property - Bush fire management and mitigation is a high priority.	Biodiversity conservation Visual landscape protection Rural land use Catchment management Bushfire management
3. Built Environment: ‘Well planned built landscapes that are progressive, vibrant, diverse and reflect the Shire’s unique country lifestyle.’	Settlement, Infrastructure
3.1 Development of local hubs - Development of town centres with improved access to housing, services and facilities. 3.2 Safe access - Diversity of transport modes. 3.3 Improved amenities - Focus on improved asset management.	Townsites New residential Transport Water supply and sewerage
4. Economic Growth: ‘Thriving, sustainable and diverse economic investments and employment opportunities, from cottage to large-scale industry.’	Economy
4.1 Economic growth - Provision of future local employment. 4.2 Local business growth - Local businesses are supported. 4.3 Increased visitors - Visitors are welcome to stay and recreate. - Improved environmental access as places to visit.	Industrial land use Tourism and recreation
5. Strong Leadership: ‘A responsive and empowering Council, which values consultation, accountability and consistency.’	

<p>5.1 An engaged community - The community feels actively involved.</p> <p>5.2 Strong partnerships and relationships - Working with stakeholders to build strong and sustainable relationships and to ensure the best use of Shire resources.</p> <p>5.3 Accountable governance Good governance which supports efficient and effective service delivery.</p>	
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Shire-Wide Strategy

This section outlines the Shire’s planning strategies relating to the Shire-wide themes of Natural Resource Management, Settlement, Infrastructure, and Economy. Section 4 outlines additional strategies that relate specifically to the Shire’s planning precincts around Bindoon townsite, Lower Chittering, Reserve Road, Muchea Employment Node, and Muchea townsite.

3.1 Natural resource management

The Shire of Chittering’s natural resource management strategies relate to biodiversity conservation, visual landscape protection, bushfire risk management, rural land use, catchment management, and basic raw materials and mining.

3.1.1 Biodiversity conservation

Objectives

- Formally protect high conservation value areas
- Support the conservation of threatened species and communities
- Retain the Shire’s natural character and sense of place

Strategies

- Implement the Shire’s Local Biodiversity Strategy, including formal protection of high conservation value areas on public and private land, as shown on the Local Planning Strategy Map (Figure 1)
- Protect high conservation value areas from basic raw materials extraction
- Retain and protect habitat for threatened species and/or communities
- Maximise the retention of native vegetation across the Shire

Policies and Actions

- Reserves containing high conservation value areas (Figure 8) are to be reclassified specifically for conservation purposes in the local planning scheme and reserve management orders
- Ensure the formal protection of high conservation value areas on land identified for Rural Conservation on the Local Planning Strategy Map (Figure 1) through conservation covenants and other mechanisms
- Proposals for land containing high conservation value areas are to demonstrate implementation of protection targets contained in the Shire’s Local Biodiversity Strategy – Appendix 5
- Any planning proposal affecting native vegetation is to be assessed against the precinct’s retention and protection targets contained in the Shire’s Local Biodiversity Strategy – Appendix 5
- Support State government acquisition of properties containing high conservation value areas for future incorporation into conservation reserves
- Support State government acquisition of properties containing high conservation value areas for future incorporation into conservation reserves
- Provide information to landowners regarding opportunities to protect and manage high

- conservation value areas on private land, such as conservation covenants and Land for Wildlife
- Consider introducing programs for rate rebates and grants to support the protection and management of high conservation value areas on private land
- Within high conservation value areas, planning applications for basic raw materials extraction (including 'State Geological Supplies') will not be supported
- Explore opportunities for formal protection of high conservation value areas when considering applications for basic raw materials extraction on adjoining cleared land
- Any planning proposal affecting native vegetation is to be accompanied by information from vegetation, flora, fauna and habitat surveys undertaken in accordance with Federal and State policy guidance
- Apply formal mechanisms for the retention and protection of threatened species habitat and/or threatened ecological communities wherever possible in future planning and decision making
- Habitat retention and protection requirements are to be determined at rezoning, or at the next stage of planning if land is already zoned for development
- Future development is to be located in existing cleared areas to ensure the retention of as much native vegetation as possible
- Proposals to rezone vegetated areas for future development will not be supported
- Structure plans, subdivision and development applications are to address native vegetation retention for biodiversity conservation and amenity, including retention of individual trees

The indicative high conservation value areas from the Shire of Chittering Local Biodiversity Strategy (endorsed by Council in 2010) are identified on the Local Planning Strategy Map (Figure 1). It is the intention that high conservation value areas will remain as native vegetation in perpetuity and not be cleared or developed for other purposes. Council's aim is to increase the formal protection of high conservation value areas by changing reserve designations, zoning for conservation, and providing support to landowners who voluntarily participate in conservation programs. The State government may also pursue acquisition of some of these areas for future incorporation into conservation reserves, as indicated in the draft Perth and Peel Green Growth Plan (2015).

The Local Biodiversity Strategy identified specific reserves for reclassification in the local planning and land tenure systems to reflect a 'conservation' purpose. This will require Council to initiate a local planning scheme amendment, and concurrently request changes to reserve purpose on relevant reserve management orders.

Several high conservation value areas are identified on the Local Planning Strategy Map (Figure 1) for potential future Rural Conservation zoning. Rural living development may be considered in existing cleared portions of these sites, subject to formal protection of native vegetation by way of conservation zoning and covenanting. All development including bushfire protection requirements will need to be accommodated without impacting on the high conservation value areas.

The high conservation value areas not identified for future Rural Conservation zoning are deemed to be unsuitable for future development because the land is remote from existing settlement, presents an unacceptable bushfire risk and/or does not contain a large enough conservation area to justify additional development rights. These high conservation value areas are to remain within their existing zones and may qualify for support for private conservation activities, such as through the Chittering Landcare Centre. The Shire will also investigate the potential for rate rebates for landowners who voluntarily enter into conservation covenants to protect IHCVAs on private properties.

Proposals involving high conservation value areas and other native vegetation will need to be accompanied by information from surveys undertaken in accordance with Federal and State policy guidance. Proposals will also need to demonstrate implementation of targets contained in Appendix 5 of the Local Biodiversity Strategy, including 'protection' targets for high conservation value areas and 'retention' targets for planning precincts.

Aside from implementation of the Local Biodiversity Strategy, Council is concerned with the retention of native vegetation for catchment management and visual landscape protection. Hence, it is expected that future development will be located in existing cleared areas to ensure the retention of as much native vegetation as possible.

3.1.2 Visual landscape protection

Objectives

- Protect valued visual landscape character
- Maintain rural amenity

Strategies

- Protect rural and natural landscape character along important travel routes
- Protect amenity for rural residents

Policies and Actions

- Within mapped road viewsheds and the Lower Chittering hills (Figure 12), development is to be avoided if it will either be visible or will dominate the landscape, depending on the type of development and the sensitivity of the location
- Planning and development proposals are to be accompanied by information on potential visual impacts, assessed in accordance with State guidance
- Amend local planning scheme provisions for visual landscape protection, including deletion of the Landscape Protection Special Control Area and introduction of new controls including permissibility of non-agricultural uses, requirements for roadside screen planting, and avoidance of sensitive locations such as the skyline, ridgelines, ridge sides and high points
- Prepare a local planning policy to provide guidance on location, siting and design, including mechanisms such as setbacks, screen planting, to protect rural landscape character
- Outside of highlighted areas on the Visual Landscape Protection Map (Figure 12), rural character and amenity for non-agricultural uses are to be maintained
- Scheme controls will continue to be supported, where they aim to protect rural amenity from undue noise, dust, commercial vehicle parking and movement etc.
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Significant roads and the areas visible from these roads (viewsheds) have been identified to inform future land use planning and development, consistent with the Visual Landscape Planning manual (2007). The Great Northern Highway and the Chittering Valley tourist drive viewsheds, and the area connecting these viewsheds within the 'Lower Chittering hills' district, are highlighted on the Visual Landscape Protection Map (Figure 12). The intention of this is to protect the visual landscape from inappropriate unsightly development and extractive industries/ industrial uses from scarifying the landscape.

3.1.3 Bushfire risk management

Objectives

- Avoid development in areas of extreme bushfire hazard
- Utilise bushfire mitigation measures that do not require the clearing of native vegetation
- Improve bushfire management infrastructure

Strategies

- Amendments to rezone land for development in areas of native vegetation will not be contemplated
- Ensure proposals for development within the Shire's bushfire prone area comply with State legislation and policy
- Vulnerable land uses are to be located within appropriately managed areas
- On land zoned for rural living or residential purposes, lot yield and layout are to reflect bushfire risks
- Improve access and water supply arrangements to assist fire-fighting operations

Policies and Actions

- Rezoning for development will be considered only for areas shown on the Local Planning Strategy Map (Figure 1) and highlighted on the Bushfire Risk Management Map (Figure 13)
- Remove local planning scheme provisions that duplicate Schedule 2 Part 10A provisions of the planning regulations
- Amend the zoning table in the local planning scheme to exclude 'Family Day-care' from all zones except Townsite, Residential R2 and Rural Residential and list as an 'A' use
- Subdivision design is to respond to site conditions, with future development located within existing cleared areas and bushfire mitigation measures to avoid impacts on native vegetation
- In areas identified for future development on the Local Planning Strategy Map (Figure 1) and highlighted on the Bushfire Risk Management Map (Figure 13), a smaller minimum lot size than reflected in the scheme may be considered, in order to maximise vegetation retention and better design outcomes.
- Strategic fire breaks intended for secondary emergency access and egress are to be developed to a constructed trafficable standard for 2WD.
- When rezoning and subdivision occurs, implement mechanisms to improve access and egress to existing rural living and residential areas on adjoining land, as highlighted on the Bushfire Risk Management Map (Figure 13)
- Identify opportunities for development contributions towards upgrades and provision of bushfire management infrastructure when scheme amendments, structure plans and subdivisions are considered

The Shire of Chittering with assistance from DFES has undertaken a risk assessment of all assets within the local government area.

The north-eastern portion of the Rosa Park rural residential subdivision in Lower Chittering has been identified as an area that would benefit from improved access and egress, to assist bushfire emergency response. The firebreak along the rear of the properties should be maintained as a formal access way, providing continuous and unobstructed vehicle access across property boundaries.

Future scheme amendments to rezone properties identified on the LPS map for future rural living should be supported by appropriate bushfire attack level (BAL) assessment information. The scheme

amendments should contain provisions requiring connections between existing and new subdivision areas. This includes:

- Lot 5 (No. 251) Morley Road – road connection to the rear of Lot 123 (No. 298) Turtle dove Drive to the east
- Lot M1942 (No. 293) Morley Road – extension of Thornbill Place and Bronzewing Court to the south
- Lot 8 (No. 100) Buckthorn Drive – road connection between Buckthorn Drive to the north and Navelina Drive to the east

Lot sizes and yields may need to be adjusted in order to accommodate building protection requirements without the need to clear native vegetation.

3.1.4 Rural land use

Objectives

- Support the sustainable development of rural land for a range of uses
- Prevent the fragmentation and/or loss of agricultural land
- Support sustainable agricultural land management
- Avoid industrialisation of rural land
- Support the diversification of land uses within the rural zone

Strategies

- Clarify land use and development opportunities for rural land
- Limit further subdivision of rural land
- Promote improved agricultural practices to reduce nutrient export and land degradation
- Focus industrial uses in appropriate areas
- Encourage activation of the rural zone
- Support tourism that is complimentary to the agricultural use and natural character of rural land
- Provide opportunities for living and working on the same property that combine light industry and housing, provided they are carefully planned; in
- general proximity to urban areas; serviced; and have design features that address buffers and amenity

Actions

- Normalise the Agricultural Resource zone in the scheme to reflect the model provisions in the Local Planning Scheme Regulations
- Normalise the Rural Retreat and Rural Smallholdings zones in the scheme to reflect the model Rural Smallholdings zone provisions in the Local Planning Scheme Regulations
- Introduce Rural Home Business as a permissible land use within the Rural zone
- Amend the zoning table in the local planning scheme to permit rural pursuits in the rural zone and change the permissibility of Cemetery land use in the rural zone from 'P' to 'A'
- Subdivision of land to facilitate intensive agriculture is not to be supported, due to the existing number of smaller rural lots in the Shire
- Rezoning of rural land for Rural Residential or Residential development will be considered only for areas shown on the Local Planning Strategy Map (Figure 1)
- Proposals to rezone Rural Smallholdings zoned land to Rural Residential or Residential will only be considered for areas close to existing settlement, serviced by reticulated water and sewerage, and capable of sustaining more intensive development without adversely affecting the natural environment or amenity

- Ensure appropriate buffers are maintained between rural and residential areas, in order to support the continuation of important agricultural land uses
- Amend the local planning scheme to include reference to land capability and the stocking rates in accordance with State policy and guidelines, particularly along priority waterways and within sensitive catchment areas
- Amend the local planning scheme to control the keeping of stock, including changing rural pursuits to a 'D' use in the rural zone.
- Proposals for intensive agriculture are to be supported by advice from the State department responsible for agriculture
- Implement recommendations of the Ellen Brook Catchment Water Quality Improvement Plan and the Muchea town site Groundwater and Soil Assessment project (under preparation)
- When assessing proposals, consideration is to be given to soil, landform, slope, vegetation cover, waterways and impact on stormwater drainage networks
- The use of appropriate stock fencing is to be mandated where vegetation is to be retained and/or protected
- Support rural landholders with sustainable land management practices including but not limited to; fencing, native revegetation, appropriate stocking, land remediation, bushfire management, etc.
- Avoid industrial sprawl along the highway, and locate these in unobtrusive nodes or other sites where they can be screened from view
- Industrial land uses are to be focused within the appropriately zoned Muchea Employment Node
- Outside of the Muchea Employment Node, industrial land uses are not considered appropriate within the 'road view sheds' or 'Lower Chittering hills' (Figure 12)
- Amend the local planning scheme to change the permissibility of transport depots to an 'X' use
- Future development is to be incidental to the agricultural intent and natural character of the rural zone
- Progress amendments to the local planning scheme to support tourism and agribusiness uses within the Rural and Rural Smallholdings zones
- Encourage tourism and related land uses (such as art and craft centre, market, reception centre, restaurant, tourism accommodation, winery/brewery) on properties with established agricultural enterprises
- Support tourism development and 'paddock to plate' initiatives in appropriate locations along Great Northern Highway, the Chittering Valley Tourist Way, within the 'Lower Chittering hills' (Figure 12 & 1) and near the Bindoon town site.
- Introduce rural enterprise zone into the Local Planning Scheme
- Identify suitable sites for possible rural enterprise zones

Approximately 90% of the Shire's Scheme area is rural. The Shire of Chittering is a major agricultural contributor to Western Australia's produce; however rural zoned land has historically been abused through ad-hoc rezoning resulting in subdivision causing fragmentation of large agricultural parcels and inappropriate industrialisation of rural land.

The strategies intention is to keep rural land in its current configuration and encourage appropriate ancillary rural uses on rural land and encourage industrial uses to be located wholly within the Muchea Employment Node.

There has been high nutrient levels identified feeding into the Ellenbrook and Brockman catchments. Agricultural practices such as stocking along catchments and fertilising in proximity to catchments and sensitive water bodies need to be better controlled, simple inclusions into the scheme such as fencing, and incentivising better practices with existing and future landholders as stipulated in the actions above is an important focus of this strategy.

Encouragement of incidental tourism uses on rural land such as accommodation, wayside stalls, wineries and repurposed farm buildings used for weddings is also encouraged on rural zoned and used land.

3.1.5 Catchment management

Objectives

Improve the health of priority catchments

Strategies

- Protect priority waterways and wetlands
- Manage nutrient export and land degradation

Policies and Actions

- Ensure appropriate setbacks of development from waterways based on site-specific assessments
- Manage stocking of land in accordance with State policy and guidelines
- Strengthen and consolidate scheme provisions of the Ellen Brook Palusplain SCA by;
 - Making single houses discretionary and Agriculture – Extensive is to be a Discretionary Use for which a DA is required and developments may only be approved where it can be demonstrated to not add to nutrient load in the catchment.
- Improvements to existing land use/development when opportunities arise.
- Review Local Planning Policy LPP 2 – Muchea Townsite to strengthen requirement for no septic tanks in Muchea Townsite and surrounds.
- Encourage innovative design for stormwater management in accordance with State guidelines.
- Encourage developers to construct vegetated swales aka 'living streams' in areas affected by the Floodplain and Palusplain.

Refer to Figure 9 detailing wetlands & waterways.

3.1.6 Basic raw materials

Objectives

- Provide for the extraction of significant basic raw materials
- Manage impacts of basic raw materials extraction on the Shire's natural environment and rural character

Strategies

- Protect 'significant geological supplies' (SGS)
- Avoid impacts of basic raw materials extraction on natural areas
- Minimise the visual impacts of basic raw materials extraction

Policies and Actions

- Protect SGS areas identified on the Local Planning Strategy Map (Figure 1) and Basic Raw Materials Map (Figure 11) unless technical information demonstrates that the resource is not of significant quality
- In the local planning scheme, delete the existing SCA and Introduce new scheme controls for SGS areas that make reference to the Local Planning Strategy Map and allow for the extraction of the resource prior to other development occurring

- Consider appropriate land uses within designated buffers to SGS areas
 - i. Planning applications for basic raw materials extraction and associated infrastructure will not be supported in areas affecting native vegetation, wetlands or waterways
 - ii. Outside of SGS areas, basic raw materials extraction and associated infrastructure is not to be visually prominent from road view sheds or the 'Lower Chittering hills' (Figure 12), near Bindoon town site, or other sensitive locations as identified by Council

Comment

Basic Raw Material extraction can be considered subject to impacts on natural areas, compatibility sensitive land uses and visual landscape impact assessments. The protection of basic raw materials 'significant geological supplies' is provided for under State Planning Policy 2.5 Rural Planning.

Historically land that had been extracted for Basic Raw Material has not been rehabilitated resulting in large voids being left on agricultural land throughout the shire. In addition to this, vegetation has been cleared for the purpose of Basic Raw Material extraction.

Since the previous strategy was developed the Shire has implemented a Local Planning Policy – Basic Raw Material and Extractive Industry Local Law 2014, however, it is considered further controls and guidance to Basic Raw Material extraction is required.

An additional consideration to the amendment/ review of the existing Local Planning Policy – Basic Raw Materials to identify specific areas appropriate for extraction in accordance with the guidance provided in the strategy should be undertaken. In particular figure 11, this should be undertaken as a priority of the strategy to ensure that development guidance is proactive to growth rather than reactive to Great Northern Highway and new proposed Bindoon Bypass upgrades. In addition to this Figure 11 should provide guidance on appropriate buffers between extraction activities and sensitive land uses. It is Council's preference that Basic Raw Material extraction occurs south of the Bindoon town site.

Land that proposes clearing of indicative high conservation value vegetation for the purpose of Basic Raw Material extraction will not be supported.

1.2 Mining/Natural Recourses

Objectives

- Exclude mining, natural resource extraction/exploration activities within the Shire that are under the control of the *Planning Development Act 2005*
- Provide comment/local guidance on all proposed extraction/exploration applications within the Shire of Chittering.

Strategies

- There is a general presumption against mining and petroleum extraction within the Shire

Policies and Actions

- Develop a strategy to deal with mining and oil and gas applications and exploration within the Shire of Chittering.
- Continue to support the 'X' use of Industry – Mining within the local planning scheme

Mining/ natural resource extraction has been a particular point of contention amongst the community due to the proximity of resource to residential settlements. The Shire has a broad range of recorded mineral deposits that are considered to be of strategic importance. There is one mineral sands processing plant approved on Brand Highway – Tronox – in Muchea. There are currently two exploration permits within the Shire of Chittering ‘EP 494’ and ‘EP 389’. EP 389 is associated with an active production site at Red Gully near GinGin which is currently producing gas from conventional gas wells. EP 494 covers an extensive area from east of Eneabba to the fringes of Perth, the permit runs through parts of the Shire of Chittering.

The Shire contains important geological resources – mineral sands on the coastal plain, natural gas and clay and bauxite on the Darling Scarp. These resources are important contributors to the Shire’s economy. The Western Australian Government has been regulating the development of petroleum or mined resources through the *Petroleum and Geothermal Energy Resources Act 1967* and the *Mining Act 1978*.

The Shire of Chittering has a historical legacy applying to minerals excluding gold, silver and other precious metals that are located on privately owned land that was alienated from ownership of the Crown before 1899. This means that the control of mining this land falls under the jurisdiction of the Planning and Development Act 2005, thus requiring local government consideration. The Local Planning Scheme 6 has ‘Industry- Mining’ as a prohibited use, a position for which Council intends on retaining into the future.

The Shire in its assessment of mining/natural resources seeks to ensure that all proposals do not detrimentally impact urban settlements, agricultural and horticultural activities and ensure that the natural environment is respected and retained.

The Shire of Chittering has a general presumption against mining and oil and gas exploration within its boundaries or surrounds.

1.3 Settlement

The Shire of Chittering’s settlement strategies relate to the town sites of Bindoon and Muchea, the new residential area planned for Reserve Road, and future rural living areas.

1.3.1 Townsites

Objectives

- Focus residential development in areas with essential infrastructure and access to community facilities and services
- Provide a range of housing options suitable for the expected demographic changes
- Improve connectivity of the Bindoon town site
- Retain amenity for town site residents

Strategies

- Focus growth in Bindoon as the primary town centre in the Shire
- Limit development within Muchea town site until reticulated water and sewerage services become available
- support provision of reticulated water by private licensed water suppliers in areas not serviced by Water Corp
- provide smaller/higher density residential lots to accommodate smaller households and lower maintenance

- provide aged care housing to accommodate older residents
- State housing
- Improve connection between west and east sides of Bindoon town site
- GNH deviation to act as western boundary of Bindoon town site
- infrastructure and service providers to consider the visual noise and odour impacts on town site residents

Policies and Actions

- incentivise intensification of development within the 'Bindoon water supply area' as shown on the Local Planning Strategy Map (Figure 1)
- Progress structure planning, subdivision and development of existing Town site zoned land
- Support rezoning of additional land to Town site as shown on the Local Planning Strategy Map (Figure 1), to extend the residential area within Water Corp water supply area
- Council to provide incentives to facilitate connection of properties to reticulated sewerage within Bindoon via the STED program.
- Undertake investigations to identify opportunities for serviceable development within the Muchea town site
- Seek State government support for the provision of water and sewerage infrastructure to developed areas of Muchea town site
- Undertake a review of the Muchea Town site Local Planning Policy.
- on eastern side of Bindoon town site where the scheme allows for R10/30, proactively seek connection to sewer to achieve higher density
- progress preparation of a structure plan to provide aged care housing
- work with the agency responsible for social housing to improve the supply in the Bindoon town site
- prepare a master plan for the Bindoon town site which addresses improved pedestrian connections and streetscape following the highway deviation
- when considering planning applications, consideration must be given to the potential impact (location, visual, noise) of the proposed road alignment
- proposals for new infrastructure by water Corp, Main Roads and other service providers (e.g. waste) to ensure amenity impacts are taken into consideration

The Shire aims to accommodate most of its future population growth within the Bindoon townsite. Muchea townsite development should be limited to subject studies confirming water table heights and future servicing. Lower Chittering does not have sufficient public amenities, Special use site 1 – Lot 9003 (Cnr Santa Gertrudis Drive & Muchea East Road, Chittering) has been zoned to be developed with community facilities such as convenience store, restaurant and shops.

3.3.2 New residential

Objectives

- Limit future residential development to areas that have access to essential infrastructure and community facilities and services
- Provide a high level of amenity in new residential areas

Strategies

- provide serviced development in the Reserve Road precinct
- new residential areas to reflect the Shire's sense of place through design guidelines
- in new residential areas, provide community, recreational facilities and opportunities for the

development of small-scale commercial/service businesses in the future

- Develop local strategies and policies for new residential areas.

Policies and Actions

- where essential infrastructure and services can be provided, proposals for new residential development of will be supported
- low density rural living proposals in areas that can be serviced will not be supported
- provide reticulated water services within the Reserve Road precinct
- only when infrastructure services can be extended from Reserve Road, adjoining lots x and y may be considered for future Residential zoning
- Ensure that new developments are R-coded to ensure the highest standard of development is statutorily required.

Prepare Design guidelines for subdivision to set street scaping and development requirements.

- Planning is underway for a new residential area on Reserve Road.
- New residential development must be able to connect to services.
- High quality residential design is required, this includes developing design guidelines for new and existing residential estates (Bindoon Vista) to improve the built form and amenity in the Shire of Chittering.

3.3.3 Rural living

Objectives

- Consolidate rural living development to existing precincts
- Rural living development to respond to the natural and landscape values
- Provide for limited RL development where there is significant conservation benefit
- Improve amenity in rural living areas
- New rural living development to be serviced

Strategies

- rezoning and subdivision of rural land for rural residential purposes will only be supported in areas defined on LPS map
- Ensure new development contributes to the desired strategic road network
- all new development is to be accommodated on existing cleared land and not impact on bushland
- encourage creative road layouts to support community bushfire safety
- Lot yield and layout to accommodate existing vegetation, habitat, waterways, landform and rural character all future subdivision and development of RR zoned land is to avoid impact on native vegetation including habitat trees for Carnaby's cockatoo
- a rural conservation zoning will be contemplated where environmental benefit can be demonstrated
- Plan for district level activity recreation community facilities
- Allow for Rural Living where it can be demonstrated that critical links can be made between new and existing subdivisions to improve bushfire safety. Note this cannot result in extensive clearing.
- lot sizes to respond to the need for connection to reticulated water services

Policies and Actions

- See Figure 1.No re-subdivision of lots unless identified on LPS map.
- Introduce Rural Residential schedule to scheme – specific provisions relating to vegetation, visual landscape, bushfire etc.
- See Figures 13 & Transport
- See Figure 13
- See Figure 13
- Structure planning will be required for Lot 8 Buckthorn Road, Lot 6 Morley to demonstrate how this is to be achieved
- consider Rural Conservation for lots specifically referred to within the strategy maps and mechanisms for ongoing protection through conservation covenants et al.
- Allow for the development of a district recreational facility in Maryville, Lower Chittering provide for the development of an activity centre in Maryville, Lower Chittering
- Lots identified for future Rural Living Development potential can only go down to 1 hectare in size if they are serviced by water.
- High quality residential design is required, this includes providing road linkages to open up existing bottle necked subdivisions particularly in Lower Chittering, design guidelines and retention of important vegetation.

Limited additional land has been identified for future rural residential within Lower Chittering as per Figure 1.

Rural Living has traditionally been accepted as the development focus of the Shire of Chittering, particularly the Rural Residential zone. As a result of this, the Shire of Chittering has a large rural residential sprawl, nodal in some sections and accordingly has inherited a large maintenance issue with extensive road networks, drainage swales (often poorly constructed) and limited public facilities. Because the Shire is located on the periphery of the urban area, community expectations are increasing in relation to services and community infrastructure. Therefore a shift in the traditional ‘rural residential’ development focus requires change. For all future land identified for rural living or rural conservation purposes, developers are required to consider and apply the following:

- Open road linkages opening up surrounding subdivisions that previously only had one entry and exit point.
- Lots proposed to be 1ha or less requires connection to reticulated water services.
- High conservation value vegetation is to be retained at all times, development is to occur in cleared spaces as indicated in Figure 13
- Public open space is to be developed to a high standard in accordance with Liveable Neighbourhoods.

1.4 Infrastructure

The Shire’s infrastructure strategies relate to transport, and water supply and sewerage.

1.4.1 Transport

Objectives

- Leverage opportunities from improved network access to metropolitan centres

Strategies

Provide a focus for freight and logistic based industries at MEN

- North Link
- Minimal noise and visual impacts of GNH Bindoon deviation on existing and future residents

Policies and Actions

Facilitate structure planning and associated studies to support land release in MEN

- Develop a Local Planning Policy which focuses on Design Guidelines to help manage the impact of the Highway on agricultural land abutting the Highway.
- SPP 5.4 + guideline: noise wall and screen planting

The existing transport network within the Shire of Chittering comprises of road and rail infrastructure and services. Most roads located within the Shire are currently controlled by the local government. However, there are three major changes proposed to Chittering current road network, as follows:

- Northlink
- Muchea to Wubin upgrade
- Bindoon Bypass

These upgrades will improve the strategic freight network within the shire and its connectivity to the Perth Metropolitan region and the north.

Both the towns of Bindoon and Muchea are situated on, or in close proximity to the existing Great Northern Highway alignment. To the South, this road connects the Shire to the City of Swan and the City of Perth thereafter. To the North, this road flows into New Norcia and further North into the Pilbara. This makes it the most important stretch of road traversing the Shire. Main Roads WA will be upgrading the Great Northern Highway between the furthest North into the town of Wubin and Muchea in the South. This project will start in 2017 and its estimated completion date is in 2019. In Chittering, a 14km stretch of the road in Muchea will be upgraded. The most significant change that this project will bring is the construction of a bypass road directed west of Bindoon (Main Roads, 2016). The purpose of these roadworks is to allow larger road trains (triples and quads - 53.5m) to travel on the highway, increasing freight efficiency. The other major road development underway in the Shire is the Tonkin Highway extension (formerly known as Perth to Darwin highway), which will connect Muchea to the industrial parts of the metropolitan area.

As part of the proposal process, the Shire undertook research into the affects a bypass could have on the town of Bindoon. In summary, this research concluded that any adverse economic impacts are short term, and that such towns usually and ultimately benefit from a bypass in the long term, provided the population of the town exceeds 2,500 people. Bindoon has a population of 1,063 people, placing it at risk. In addition, the Shire's proximity to Midland as a major service centre may cause traffic to go around Bindoon to access the better services present there. To facilitate this change, the Shire has made stakeholder consultation and marketing strategy a priority for the town. The strategy has identified the need for better signage in the Shire to advertise the different towns, including a gateway entry to Bindoon. Regardless, the Shire faces a challenge to promote the retail services that exist in the Shire, as opposed to travelling south into Midland.

The Strategy has considered the proposed impact of the new proposed road network, the Bindoon Bypass should act as the new western boundary for the Bindoon town site.

1.4.2 Water supply and sewerage

Objectives

- In non-residential areas, ensure appropriate servicing
- In residential areas require high quality development and services

Strategies

Industrial land use

- Serviced new development commensurate with intended land use and in context of environmental conditions
- Require high quality development in accordance with Department of Water requirements for Better Urban Water Management.

Policies and Actions

- Ensure that adequate provision is made for wastewater disposal, stormwater management and drainage, water supply
- Ensure that proposals take account of impacts on biodiversity, groundwater, and surface water.
- Identify on the Local Planning Strategy maps the location of all approved and registered waste disposal sites in the Shire including the location and extent of the Department of Environment and Conservation's recommended odor buffers.
- Identify the location of all approved and registered waste disposal sites in the Shire and classify them 'Public Purpose' Reserve in Local Planning Scheme No.6.
- In residential areas - Implementation of Better Urban Water Management, including preparation of UWMP.

The Shire of Chittering is currently the only shire within the Wheatbelt without a sewerage system. The Minister of Water has committed to the installation of a STED scheme by 2018 for Bindoon town site. This will allow land currently zoned R10/R30 the ability to connect and utilise its higher density allocation of R30. The Shire has also received commitment that Bindoon town site currently serviced by reticulated water supply by Water Corporation will be able to service all future intensification within the designated water area.

Muchea town site is heavily constrained by a high water table and important catchments. In 1999 a combined group of government agencies presented a report placing Muchea as a high priority town for a deep sewerage scheme on both environmental and health grounds, however due to lack of government funding this has not occurred. There is currently study being prepared to determine if the ground water levels have changed.

Until Muchea is appropriately serviced, it is recommended that no further intensification of development occur, only measures to support the existing town site and community.

3.4.3 Industrial land use

Objectives

- Facilitate development of Muchea Employment Node
- Recognise strategic land uses

Strategies

- Provide for industrial land uses at Muchea Employment Node

- support the use and development of land at MEN for industrial purposes
- concentrate transport, storage and other related industries in the MEN
- avoid ad-hoc industrial development outside MEN
- appropriately zone and buffer important land uses

Policies and Actions

- amend the local planning scheme to differentiate between the general and light industrial zones
- investigate potential for pre-funding and/or cost-sharing arrangements for road construction and other infrastructure
- amend the scheme to prohibit transport depots, warehouse/storage in the rural zone, unless associated with a primary production industry
- Consider nominal buffers when assessing proposals

The Shire of Chittering historically has had little to no land allocated for industrial/light industrial land uses. As a result, rural land has been inappropriately used for industrial uses such as transport depots and warehouse/storage uses with or without the approval of the Shire. In 2011 the Department of Planning endorsed the Muchea Employment Node Structure Plan, a strategic industrial estate, which covers approximately 1100ha of Agricultural Resource land in Lower Chittering/Muchea.

The Muchea Employment Node is located at the intersection of the Brand Highway / Muchea East Road and Great Northern Highway, and is an area set aside for service-based uses such as transport, livestock, fabrication, warehousing, wholesaling and general commercial use. The Muchea Employment Node Structure Plan provides a 20 year land use planning framework. New development in the Employment Node will provide a concentration of employment opportunities for people living in and around the Shire of Chittering. The Muchea Employment Node is separated from residential areas by 1km buffer. This provides a transition area, where rural land uses are compatible with residential. Detailed planning of the Muchea Employment Node is underway, with the northeast portion of the node set to be developed in the near future.

This strategy proposes an investigation into which land uses are appropriate. This Strategy seeks to consolidate industrial uses in the employment node, thereby retaining rural land for Natural Resource Management and for primary production, and as a result achieving the Shire's objectives to retain natural landscapes and rural amenity. All proposed industrial type uses are to be located within the Muchea Employment Node.

3.4.4 Tourism and recreation

Objectives

- Provide expanded opportunities for tourism within the Shire
- Explore recreation based tourism activities

Strategies

- Encourage ancillary tourist uses within Rural zone (e.g. chalets, hobby wineries, farmers markets etc.)
- Develop a strategy for identifying and improving the visibility of valued landscape features and areas (e.g. through roadside pullover bays along wildflower roads, picnic areas, walk trails)
- Improve access to active and passive recreation facilities for local residents and visitors

Policies and Actions

- Plan for development, promotion and sustainable management of trails – drive, cycle, bridle,

and hike (in accordance with the Trails Network Masterplan.

- support tourist developments that are suitable for the setting and take account of bushfire risks, servicing and environmental conditions
- Improved access and facilities at Chittering Lakes
- Establish linkages between tourism in the Shire and outside
- Plan for a future caravan park in Bindoon to service travellers along Great Northern Highway
- Encourage popup and wayside stalls in Tourism Precincts (Bindoon and Lower Chittering town sites)
- Develop incentives to encourage nature based 'Eco-Tourism' uses in the Shire. (May require scheme amendment).
- Plan for the provision of community recreation and tourism facilities with small scale commercial at Maryville village centre (shown on Map)
- Expand recreational facilities in NE of Muchea town site
- Plan for the provision of district level community and recreation facilities in the Reserve Road precinct.
- Provide active recreation options on establishes Shire reserves.
- Encourage precinct activation through green linkages footpaths, street activation etc.

The Shire of Chittering is not primarily a tourist destination however it does attract an increasing number of tourists (according to the CVC statistical data), in particular day visitors to the region. The main attractions are:

- close proximity to Perth and other tourist locations including Avon Valley, Gingin-Moore River Region, Toodyay, New Norcia and the Swan Valley;
- picturesque hills, bushland and countryside (including walk trails);
- nearby wineries and bakery; and
- various regional/community events run throughout the year.

While there is no one specific draw card there are a number of places to visit and activities to participate in whilst in Chittering. The Rural zone allows for a number of tourism type uses such as repurposed farm sheds for wedding receptions and paddock to plate initiatives need to be encouraged within existing rural land and major settlements.

4. Precinct Strategies

The following strategies have been developed for specific planning precincts across the Shire (refer to Figure 14). From northeast to southwest the planning precincts are:

- Bindoon
- Lower Chittering
- Reserve Road
- Employment Node
- Muchea

4.1 BINDOON

Objectives

- Develop Bindoon as the primary population centre in the Shire
- Improve Binda Place as a destination

Strategies

- Facilitate subdivision and development of land currently zoned Townsite
- Support zoning of additional land for residential purposes within the Water Corporation's water supply area
- Incentivise activation of vacant buildings and spaces in Binda Place.
- Increase density within appropriately serviced Townsite lots.

Tourism

- Encourage mixed housing types to accommodate state housing and aged accommodation.

Actions

- Rezone Lot 3 Gray Road from Rural to Rural Residential
- Rezone Lots 209, 900 and 901 from Rural Smallholdings to Rural Residential
- Support higher density development and possible Subdivision of R30 where STED is connected
- Encourage mixed use sites in Binda Place.
- Support the development of a Caravan Park in Bindoon Towncentre.
- Treat the Bindoon Bypass as the new western boundary to Bindoon townsite.
- Encourage aged care development on lot 88 Woolah Rise, Bindoon.
- Develop a masterplan for Binda Place
- Develop design guidelines built form within Binda Place
- Develop design guidelines for residential development within Bindoon Vista subdivision.
- Apply the actions and intent of the Bindoon deviation strategy.

The strategic direction for Bindoon Townsite is to be the primary residential growth area for the Shire. Being the only serviced centre in Chittering with capacity to grow and intensify to R30 this is the logical place to focus in on development.

A significant challenge lies ahead for the Bindoon Townsite will be the Bindoon Bypass, this proposes to divert all heavy traffic west of Bindoon Townsite. Elaborate on Bindoon deviation strategy.

4.2 LOWER CHITTERING

Objective:

Limit additional un-serviced rural living development in Lower Chittering

Strategies

- Investigate options for future expansion of the catholic school within the Maryville village centre, including land swaps
- Provide facilities and services for residents and visitors in Lower Chittering e.g. community centre, convenience store
- Improve community activity within Lower Chittering

Actions

- Explore land swap (of Lots 213? & 214 Angus Way, Lower Chittering, with portion of Lot 8017 Muchea East Road, Lower Chittering for a multi user facility for recreational purposes.
- Provide for future rural residential development on Lot 10 Muchea East Road, Lot 8 Buckthorn Drive, and Lots 5, 13 and M1942 Morley Road
- Prepare a structure plan for the proposed Maryville Village centre (comprising Reserve 52220 and lots 9011 and 597 Muchea East Rd)
- Encourage space and plan activation in Maryville.
- Amend the scheme to allow for a variety of home businesses utilising the National Broadband Network.
- Encourage landholders with development potential to improve access/egress to existing subdivision configurations.
- Consider relocating the special use site intended for commercial development to support the Maryville development to face Chittering Valley Way.

Discourage any development proposals which may have a negative view sheds on Lower Chittering Hills

Lower Chittering is anticipated to reach its capacity in the next 10 years for rural living development. The development of a village centre in Maryville will provide recreation, retail and tourism facilities in Lower Chittering. Ongoing upgrades to telecommunications infrastructure will serve to support lifestyle and commercial activities within the Shire.

The western extension of Lower Chittering precinct investigation areas for long-term housing (following the development of Reserve Road and its northern extension, which will provide reticulated water supply and sewerage infrastructure to the area) includes other opportunities for Rural Conservation zoning. Such zoning may include the protection of Indicative High Conservation Vegetation Areas (IHCVA) and allow development in existing cleared portions (subject to separation buffer to extraction of BRM SGS north of Blue Plains Road).

The priority planning directions are to protect native vegetation, improve bushfire access, and avoid further unserviced development.

4.3 RESERVE ROAD

Objective: Support future serviced residential development along Reserve Road

Strategies

- Support provision of reticulated water by a private supplier
- Potential extension of Residential area northward following development of Lot 2 Reserve Rd – rezoning from Rural Residential to Residential subject to water provision and protection of native vegetation
- Plan for provision of additional community facilities & services for the future population within Reserve Road precinct

Actions

- Encourage high quality private infrastructure
- Appropriate linkages with existing subdivisions
- Design Guidelines for future development of Reserve Road, including nature strip planting, built form and human and property safety.
- Ensure all future development is appropriately serviced.

- Potential extension of Residential area northward following development of Lot 2 Reserve Rd – rezoning from Rural Residential to Residential subject to water provision and protection of native vegetation

Investigation areas for long-term housing (following the development of the approved Reserve Road subdivision, which will provide reticulated water supply and sewerage infrastructure to the area) include areas which can satisfy the following:

- development in existing cleared areas (approximately 80 ha) and protection of native vegetation in reserve and/or private lot under conservation covenant
- areas that do not provide habitat for Carnaby's cockatoo
- retention of remnant vegetation including isolated trees

Another opportunity for serviced development exists on areas provided for on the strategy map.

4.4 EMPLOYMENT NODE

Objective: Facilitate industrial development within the Employment Node

Strategies

- Support structure plans that are consistent with MENSPP (WAPC) Support landowners with the preparation of local structure plans in accordance with the MENSPP
- Protect the rural amenity and environmental sensitivities currently existing within the Muchea Employment Node.

Actions

- Alternative service areas
- Investigate pre-funding road construction
- Investigate options for trunk infrastructure to support within entirety of MEN
- Allow for incidental uses to support the industrial hub, including food and essential services with a human interface.
- Encourage all future industrial development to be located within the Muchea Employment Node.

This strategy proposes an investigation into which land uses are appropriate. It further seeks to consolidate industrial uses in the Muchea Employment Node, thereby retaining rural land for Natural Resource Management and for primary production, and as a result achieving the Shire's objectives to retain natural landscapes and rural amenity.

There has been pressure for rural land to accommodate industrial land uses. This is historically due to the lack of industrial zoned land, where after the Shire would traditionally permit such uses on an ad-hoc basis. With the advent of the Muchea Employment Node, these uses are forthwith to be located within the Node.

4.5 MUCHEA

Objective: Restrict land use and development in sensitive areas of Muchea (consistent with local planning policy)

- Maintain Muchea as a contained village fostering a rural community lifestyle in a healthy environment

Strategies

- Future growth and development to be guided by the groundwater study

Actions

- Depending on results of the study, consider changing of zoning in response to environmental and public health conditions.
- Group dwellings to not be permitted in scheme for Muchea town site.
- Improved connection across Brand Highway between town site (west) and retail (east)
- Improve existing community facilities located in Muchea
- Pursue a change of reserve purpose for the POS.
- Improve recreation facilities in North East of the town
- No further development or land use intensification being permitted until such time as the land is serviced
- Support landholders to minimise nutrient impacts of agriculture on groundwater

Until the Muchea town centre can be appropriately serviced, intensification of development will not be supported. Notwithstanding, efforts to improve existing community facilities is encouraged and promoted via this strategy.

Implementation

The Local Planning Strategy is to be used as a guide to assist Council and the WAPC in planning decision making. The Strategy will be used in regard to the amendment of the Scheme or preparation of a new scheme, structure plans, subdivision applications and development proposals. Proposed amendments to the local planning scheme (table):

- New zone category
- New or amended provisions
- Rezoning of specified lots
- Further rezoning opportunities
- Changes to use class table
- Changes to residential densities
- Changes to SCAs
- New or revised local planning policy

5.1 Local Planning Strategy Map**GIVE POWER TO MAP – GUIDE COUNCIL & PROPONENTS**

LPS map is referred to in various policies/actions

Also requires reference in local planning scheme for visual landscape protection, basic raw materials – where LPS map will replace SCAs for these matters

Spatial layer	Explanation
Groundwater protection	Land within the gazetted Public Drinking Water Supply Area that is included within the 'Special Control Area – Water Supply' under the scheme, and protected in accordance with SPP2.5
Industrial	Land currently zoned as 'Light Industrial' under the scheme, land within Muchea Employment Node area that may be zoned Light Industry or General Industry in future (subject to local structure

	planning), and land owned by Tronox Pty Ltd that is approved for the additional use of 'Mineral Sands Processing Plant' under the Scheme
Reserves (various)	All existing Crown reserves, as well as freehold land that is designated as local reserve under the scheme, for various purposes
Residential	Land currently zoned as 'Residential R2' under the scheme
Rural residential	Land currently zoned, as well as land that is proposed for future rezoning as 'Rural Residential' under the scheme
Rural smallholdings	Land currently zoned as Rural Smallholdings and Rural Retreat under the scheme, that is consistent with the Rural Smallholdings zone in the Model Provisions
Townsite	Land currently zoned, as well as land that is proposed for future rezoning as 'Townsite' under the scheme
Rural	Land currently zoned as 'Agricultural Resource' under the scheme, that is consistent with the Rural zone in the Model Provisions
Rural conservation	Land currently zoned, , as well as land that is proposed for future rezoning as 'Rural Conservation' under the scheme
High conservation value	Indicative High Conservation Value Areas (IHCVAs) identified in the Shire of Chittering Local Biodiversity Strategy, endorsed by Council in 2010
Bindoon water supply area	Area identified by Water Corporation for future reticulated water supply
Significant basic raw materials	State Geological Supplies identified by the Department of Mines and Petroleum, in accordance with State Planning Policy 2.5 Rural Planning
Priority waterways	Priority waterways including freshwater creeks, identified by the Ellen Brockman Catchment Group
Proposed road	Proposed alignment of the Great Northern Highway deviation – Chittering Roadhouse to Wubin
Gas pipeline	High pressure gas pipelines requiring special consideration, in accordance with policy
65m contour	65m ASL contour, above which further development may be permitted, in accordance with Local Planning Policy No. 2 – Muchea Village
Water production bore	Water Corporation water production bore, requiring special protection in accordance with policy

5.2 Scheme review

Following the implementation of this strategy, Council is expected to undertake a total scheme review in order to appropriately apply the actions within the Shire. In summary, the review is to consider the following:

- Rural zones that are consistent with *Planning and Development (Local Planning Schemes) Regulations 2015*
- Maryville school site rezoning
- Change reservation of some Local Public Open Space reserves to Conservation
- Remove BRM and Landscape SCAs, instead include provisions that reference maps in this strategy
- Create a schedule of Rural Residential precincts
- Implement Rural living development provisions – building envelopes/setbacks, water supply

5.3 Management order changes

Crown Reserves - change of purpose (conservation, BRM)

5.4 Additional planning

- Support review of structure plans – e.g. Bindoon, Lower Chittering
- Undertake structure planning – e.g. Bindoon townsite, Maryville village centre, MEN

6. Monitoring and Review

Part 6 of *Planning and Development (Local Planning Schemes) Regulations 2015* – Review and consolidation of local planning schemes provides local authorities with guidance on the preparation and implementation of local planning schemes.

In particular, Clause 65(2) states that if a local planning scheme was gazetted more than five years before the gazettal of the new Regulations (as is the case for Shire of Chittering Town Planning Scheme No. 6), the local government must carry out a review of the local planning scheme within three years of the Regulations coming into operation.

Clause 66 requires that a review report approved by Council be provided to the WAPC within six months of this date, which translates to the end of February 2019 for the Shire of Chittering. The report is to outline the dates that the local planning scheme and all of its amendments were gazetted.

The Strategy conversely is designed to provide a vision for anticipated land use and development in the shire. Notwithstanding, as new information is likely to come to hand, or land use issues and pressures affecting the shire will change over time, the Strategy remains capable of further review or amendment.

PART TWO: BACKGROUND INFORMATION & ANALYSIS**1. Introduction**

The Shire of Chittering Local Planning Strategy outlines Council's vision for its local government area. It has been prepared to guide land use planning over the next ten years, and provides the rationale for land use and development controls in the Shire's local planning scheme.

The local planning strategy is:

- a public document which provides the opportunity for the community and government agencies to have input into the Shire's strategic planning;
- a plan that provides strategies for the future zoning of land for various land uses and guidance for the future subdivision and development of land; and
- a dynamic document that can be amended in response to changes in policy and factors influencing the Shire's growth and development.

The local planning strategy comprises two parts. Part One summarises the key planning and development issues that are relevant to the Shire of Chittering, and sets out a vision and strategic direction for the Shire, as well as land use planning actions required to achieve the vision over the next ten years. Part Two (this document) includes background information, analysis and detail required to support the high level strategies and actions in Part One.

Section references are provided in Part One to relevant background details in Part Two to assist with interpretation and implementation. The overall strategy map depicts existing and proposed land uses between 2017 and 2027. Longer term (10-50 years) land use and development strategies are addressed within the body of the report.

1.1 Requirements for a Local Planning Strategy

Local planning strategies are provided for under Part 3 of the *Planning and Development (Local Planning Schemes) Regulations 2015* (the Planning Regulations). According to Regulation 11 clause 2, a local planning strategy must:

- (a) set out the long-term planning directions for the local government;
- (b) apply any State or regional planning policy that is relevant to the strategy; and
- (c) provide the rationale for any zoning or classification of land under the local planning scheme.

The local planning strategy has a very important role in land use planning as it guides decision making on scheme amendments (including rezoning of land) and the subdivision and development of land within the local government area. Unlike local planning policies adopted by Council, the local planning strategy is endorsed by the Western Australian Planning Commission (WAPC) and therefore holds significant weight in the planning decision making process.

The Planning Regulations introduced a track-based system for local planning scheme amendments (Part 5) whereby 'an amendment that is not consistent with a local planning strategy' is defined as a 'complex amendment' and requires the local government to seek the support of the WAPC prior to it being advertised for public comment.

Part 3 of the Planning Regulations outlines the process of developing a local planning strategy, including certification of the draft strategy by the WAPC, advertising of the draft strategy for public comment, consideration of public submissions, endorsement of the final strategy by the WAPC, publication of the endorsed strategy, and amendments to the local planning strategy.

1.2 Background to the Local Planning Strategy

The *Shire of Chittering Local Planning Strategy 2001-2015* was endorsed by the WAPC on 29 June 2004. The Shire had been experiencing considerable pressure for the subdivision of rural land and a strategic plan was required. The local planning strategy proposed the rezoning of extensive areas of the Shire for rural lifestyle purposes, with priority given to land within a 'priority development area' (PDA).

On 2 April 2008, the WAPC resolved to: (i) instruct the Shire of Chittering to review aspects of its local planning strategy; and (ii) advise that it would not support amendments for rezoning outside the strategy's PDA, and that the amendments must be justified in terms of proximity to existing development, services and infrastructure and impacts on environmental values. On 28 October 2008 the WAPC sought to clarify the treatment of previously submitted scheme amendments, and resolved to continue to progress amendments to rezone land located within the PDA from Agricultural Resource zone to Rural Residential, Rural Retreat and Rural Small Holdings.

The WAPC also resolved at its 28 October 2008 meeting: (i) to request that the Shire of Chittering not initiate any amendments located on land outside the PDAs to rezone land from agricultural resource to Rural Residential, Rural Retreat or Rural Smallholdings prior to the review of the local planning strategy; and (ii) that the Shire of Chittering formally request assistance from the Department of Planning to review its local planning strategy.

Around the same time, the Shire was also developing its Local Biodiversity Strategy, with the assistance of the Western Australian Local Government Association (WALGA) Perth Biodiversity Project. The draft local biodiversity strategy was released for public comment in 2008, and the final was endorsed by Council in April 2010. The local biodiversity strategy identified that rural residential development was having an adverse impact on native vegetation, and supported the review of the Shire's local planning strategy.

The Shire's draft revised local planning strategy was prepared with the assistance of Greg Rowe and Associates, and was released for public comment in July 2014. The public submissions received highlighted a number of outstanding issues to be addressed, including clarification on the intent of the 'indicative high conservation value areas' depicted on the strategy map.

At its meeting on 18 November 2015, Council resolved to place a moratorium on any future proposed amendments to the local planning scheme to rezone land, with the exclusion of land located within the Muchea Employment Node Structure Plan area, effective from 29 February 2016. This moratorium was implemented to avoid any further potential delays to the finalisation of the local planning strategy.

This revised draft local planning strategy has been prepared with technical assistance from the Department of Planning, to guide land use planning over the next ten years. Future planning and development within the Shire is to be consistent with the Local Planning Strategy. The success of implementation of the strategy lies in its acceptance by the local community and a commitment from the local government to implement its Objectives, Strategies and Actions.

1.3 Overview of the Shire of Chittering

The Shire of Chittering is located on the northern boundary of the Perth metropolitan region, approximately 56 km from the Perth CBD. The Shire shares its boundaries with the City of Swan (south), City of Wanneroo (southwest), Shire of Gingin (northwest), Shire of Victoria Plains (north) and Shire of Toodyay (east). The Shire covers an area of 1,220km² and contains the towns and localities of Bindoon, Muchea, Lower Chittering, Mooliabeenee and Wannamal. Muchea townsite lies approximately 10 km north of Bullsbrook townsite, and Bindoon townsite is situated about 35 km east of Gingin townsite.

The majority of the Shire's population resides in Muchea, Lower Chittering and Bindoon. North of Bindoon townsite the Shire is dominated by agriculture, and opportunities for land use change, subdivision and development are limited. Hence, the local planning strategy focuses on the southern portion of the Shire, generally to the south of Mooliabeenee Road and Bindoon-Dewars Pool Road.

2. State and Regional Planning Context

The local planning strategy has been prepared within the context of State and regional planning provisions relevant to the local government area. The relevance of these documents to the local planning strategy is set out below.

2.1 State Planning Strategy

The State Planning Strategy (WAPC 2014) Strong and resilient regions is a key strategic goal of the State Planning Strategy, with the priorities being a diverse economy, creating places where people want to live and work, and inter-regional collaborations to harness the competitive advantage of each region. These key priorities have been developed further in the Draft Wheatbelt Planning and Infrastructure Framework (2014) and also guide this local planning strategy.

The Strategy plans for a doubling of the State's population by 2056 and supports interconnected, vibrant and resilient communities with strong recognition of the importance of regional development. vision, principles, strategic goals, South West sector, economic development, resources economy, education/training, tourism, agriculture/food, land availability, physical infrastructure, movement, water, energy, waste, telecommunications, social infrastructure, spaces & places, affordable living, health/wellbeing, environment, security (Muchea air weapons range, Bindoon training depot) – refer to table on p112

The Shire of Chittering is located within the Wheatbelt Region of Western Australia. The State Planning Strategy's vision for the Wheatbelt Region is summarised as follows:

- linked key townships by strategic freight networks; and
- encourage innovative practices with agriculture and environmental management, including the rehabilitation and protection of productive agriculture.

The Shire of Chittering will play an important part implementing and actioning some of the visions of the State Planning Strategy through the following:

- Protecting prime agricultural land and natural resources from incompatible development;
- Protection of the natural landscape;
- Facilitate the development of a range of different lifestyles; and

- Facilitate the development of an improved transport network.

2.2 WAPC policies

The following State planning policies and Development Control policies have been identified as being most relevant to land use planning in the Shire of Chittering:

WAPC policy	Summary of relevant policy objectives & measures
State Planning Policies	
1 State Planning Framework	provides the basis for decision making across the State and general principles for land use planning, it brings together existing policies, strategies and plans approved by the WAPC
2 Environment & Natural Resources	This is a broad policy that is supplemented by more specific policies. It details the guiding objectives for water resources, air quality, soil and land quality, biodiversity, agriculture and rangelands, minerals/resources, aquaculture, greenhouse gas emissions and energy efficiency.
2.2 Gnangara Groundwater Protection	relate to the Groundwater Protection Area and Public Drinking Water Supply Area located to the west of Muchea
2.4 Basic raw Materials	Whilst this policy is not specific to areas outside of Perth, the general objectives relating to appropriate extraction of basic raw materials are applicable to Chittering. Particularly as the Shire is a peri-urban shire under pressure from the metropolitan area for basic raw materials. It should be noted SPP2.5 contains more specific clauses relating to basic raw materials within Chittering
2.5 Rural Planning	<p>This policy is the primary guide to rural development, and development of rural properties. In addition the policy provides guidance on rural subdivision and basic raw material extraction, particularly to Chittering.</p> <p>The intent of the policy is to protect and preserve rural land due to the importance of their economic, natural resource, food production, environmental and landscape values.</p> <p>The objectives of this policy will be applied to the Strategy, particularly in relation to the scheme areas north of Bindoon, and the consolidation of existing urban and rural living areas, such that they do not encroach on existing rural areas.</p> <p>Particularly the policy requires the following matters to be considered within the Strategy:</p> <p>(a) provide more detailed consideration and guidance in relation to regional strategic planning;</p> <p>(b) only identify land for rural living zones in accordance with State Planning Policy 3: Urban Growth and Settlement and clauses 5.2 and 5.3 of the policy;</p> <p>(c) only identify rural land for conversion to other land uses when consistent with the objectives of the policy;</p> <p>(d) indicate separation distances and/or buffers for land uses where necessary; and</p> <p>(e) provide soil and land capability information regarding the risk of nutrient export where land uses may generate increased nutrient loads in rivers, estuaries or their tributaries.</p> <p>As noted previously in this strategy, these points are detailed and</p>



	discussed in detail.
2.7 Public Drinking Water Source	<p>The policy is designed to protect public water priority drinking areas. Objectives of this policy that will be implemented into the Strategy are as follows;</p> <p>Protection of public drinking water through appropriate statutory provisions including special control areas.</p> <p>Land use and developments proposed in all priority source protection areas that have the potential to cause detrimental impact on public drinking water supplies should not be permitted unless they can demonstrate the impacts can be satisfactorily managed or avoided.</p>
2.5 Rural Planning Policy	<ul style="list-style-type: none"> • Secure significant basic raw material resources and provide for their extraction; promote sustainable settlement in and adjacent to existing urban areas; protect and sustainably manage environmental, landscape and water resource assets. • Create new rural lots only in accordance with Development Control Policy 3.4 • Planning requirements for rural living precincts, including
2.9 Water Resources	This policy aims to protect, conserve and enhance water resources that have significant economic, social, cultural and/or environmental values.
3 Urban Growth & Settlement	This policy focuses on appropriate measures for the creation of sustainable communities, whilst managing strategic urban growth across Western Australia.
3.1 Residential Design Codes	The Residential Design Codes detailed in this policy assist with planning for residential development, particularly in the townsites and within the Reserve Road subdivision. This policy is incorporated into all Western Australian local planning schemes, requiring council to utilise the objectives of this policy when making local planning decisions.
3.6 Development Contributions for Infrastructure	<p>The Western Australian Planning Commission has established State Planning Policy 3.6 to provide guidance for the use of DCPs by local government. The policy identifies the circumstances where contributions can be sought from developers toward shared infrastructure. The nature of items that can be subject to contribution requirements range from utility services through to community infrastructure.</p> <p>The Shire has previously resolved to prepare a DCP for the coordinated provision of community services for the Shire. Outputs from this work included a draft cost apportionment and contribution liability report. Consultancy Game Planning Australia (GPA) was subsequently appointed to review the potential terms of a DCP.</p> <p>Work to date to prepare the DCP has been based on a forecast population growth rate of 4.1% per annum over the next 10 years. Based on average occupancy rates, this growth would generate the need for an additional 870 dwellings over 10 years.</p> <p>The Department of Planning has found, however, that the actual lot production rate is significantly lower than modelled growth scenarios. Data collated by the Department finds only 71 lots have been created since 2009. This amounts to approximately 10 lots per year – significantly less than modelled scenarios that would yield around 87 dwellings per year.</p>

3.7 Planning for Bushfire Management	<p>The provisions of this policy require the following information to be supplied to accompany the Strategy:</p> <p>a) (i) the results of a BHL assessment determining the applicable hazard level(s) across the subject land, in accordance with the methodology set out in the Guidelines. BHL assessments should be prepared by an accredited Bushfire Planning Practitioner; or</p> <p>(ii) where the lot layout of the proposal is known, a BAL Contour Map to determine the indicative acceptable BAL ratings across the subject site, in accordance with the Guidelines. The BAL Contour Map should be prepared by an accredited Bushfire Planning Practitioner; and</p> <p>b) the identification of any bushfire hazard issues arising from the relevant assessment; and</p> <p>c) clear demonstration that compliance with the bushfire protection criteria in the Guidelines can be achieved in subsequent planning stages.</p> <p>Studies have been undertaken to assess the bushfire risk in each of the newly identified areas for residential development.</p>
4.1 State Industrial Buffer (Amended) (Draft)	<p>The main focus of this policy is to avoid land use conflict between industrial uses and essential service infrastructure and sensitive land uses. There are a couple of existing areas within the Shire of Chittering that would require the formalisation of buffers to help assure existing and future development avoids conflict. This includes areas surrounding the Muchea Employment Node.</p>
5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning	<p>This policy aims to promote a system in which sustainable land use and transport are mutually compatible. The objectives of this policy are to protect people against unreasonable levels of noise created through transport, particularly around major transport corridors and strategic freight routes.</p> <p>This policy will be particularly applicable to the Shire of Chittering with the current and intended upgrade of the Northlink development and Perth to Darwin Highway upgrades.</p>
Development Control Policies	
DC1.1 Subdivision of land – general principals	<p>This policy sets out the general principles, which will be used by the Western Australian Planning Commission (WAPC) in determining applications for the subdivision of land. It indicates the WAPC’s basic requirements for the creation of new lots as well as the procedures it will follow in processing subdivision applications.</p>
2.3 Public Open Space in Residential Areas	<p>The basic component of this policy is the requirement that 10 percent of the gross subdivisible area of a conditional subdivision shall be given up free of cost by the subdivider for public open space. The policy reflects the conclusion that while the 10 percent requirement should continue to be applied, there may be some flexibility applied in particular circumstances. The policy is closely related to existing policies which deal with the subdivision of residential land and also with coastal management issues.</p>
2.5 Special Residential Zones	<p>The purpose of Special Residential zones is to allow for lots of a size which will offer a style of spacious living at densities lower than those characteristic of traditional single residential developments but</p>

	higher than those found in Special Rural zones. This policy sets out the requirements of the Commission for the creation of such zones in terms of location, internal design and servicing, and statutory provisions.
3.4 Subdivision of Rural Land	This policy sets out the principles that will be used by the WAPC in determining applications for the subdivision of rural land. The policy is consistent with the objectives of State Planning Policy 2.5: Rural Planning, which establishes the statewide policy framework for rural land use planning in Western Australia. Rural zones are generally flexible and permit a range of agricultural, commercial and industrial land uses. This policy aims to support the range of land uses that are appropriate for rural settings, while limiting the loss of this land to incompatible uses such as housing.
4.3 (Draft) Planning for High-Pressure Gas Pipelines	This policy establishes the Western Australian Planning Commission's (WAPC) position regarding development along high-pressure gas pipelines. It seeks to protect people from unacceptable levels of risk from high-pressure gas pipelines by protecting high-pressure gas pipelines from unregulated encroachment. Development along such pipelines may pose a risk to pipeline integrity and, equally, may be at risk should a pipeline failure occur. The consequences of a pipeline failure have implications for life, property, the environment and the State's economy. The planning system should manage the interface between pipelines and other land uses.

2.3 Other State government policies, plans and guidelines

- Draft Country Sewerage Policy 2003
- Rural Planning Guidelines
- Bushfire Planning Guidelines
- Visual Landscape Planning Manual
- Better Urban Water Management
- Strategic Assessment of Perth & Peel
- Bindoon-Chittering Water Reserve Drinking Water Source Protection Plan
https://www.water.wa.gov.au/data/assets/pdf_file/0012/4080/74425.pdf
- Production bores in Reserve 40335 (Lot 18 Teatree Rd)

Guidelines for Planning in Bushfire Prone Areas

Local planning strategies should identify objectives for bushfire risk management and propose recommendations and actions to achieve these objectives by overlaying areas on the Western Australian Bushfire-Prone Area Map onto the strategy map, to help determine any conflict areas. This assessment should be used to allocate permissible land uses away from at-risk areas and flag where further assessment of the bushfire risk is required. Areas where a hazard level assessment of extreme is expected should generally not be identified for further intensification or rezoning. Should such an area be identified, further fire management planning is required before intensification or rezoning is to be considered. Where relevant, local planning strategies should identify areas where, due to the age and/or general nature of existing development, non-compliance with SPP 3.7 is expected if future development occurs. Enhanced management measures should be incorporated

for such areas to provide improved community protection in the form of improved access, water infrastructure, emergency services and vegetation management.

Specifically, the following issues should be addressed as part of the preparation of a local planning strategy incorporating bushfire-prone areas: – the location of bushfire-prone areas and the need for further assessment of the risk in such areas; – the avoidance of land use and development intensification in areas likely to maintain or generate a hazard level of extreme; – existing firefighting infrastructure such as, response or suppression capacity such as water tanks, brigades etc; – the existing road network, its likely effectiveness in a bushfire emergency, and any gaps in the access network from a bushfire safety point of view; – biodiversity issues, their interrelationships with bushfire risk areas, and means of protection for areas with high conservation values, such as the safe application of fire for land management and biodiversity objectives, accommodating adequate separation from existing or proposed buffers for wetlands, foreshores for waterways and other conservation areas; and – the location of any vulnerable or high-risk land uses within identified bushfire-prone areas and whether such uses may require management strategies to be prepared. These considerations should be formalised in an implementation plan forming part of the local planning strategy which identifies further actions and assigns responsibilities for the tasks to be undertaken in a timely manner.

To help inform the strategy and proposed future developments within the shire a number of supporting bushfire management focused plans have been developed. For future identified development sites, there have been supporting bushfire hazard assessments undertaken. There is also an overall bushfire risk management plan prepared (figure 13). The purpose of these plans is to clearly detail cleared areas appropriate for development and also the different areas of risk to take into consideration when considering developing within the Shire of Chittering.

2.4 Regional strategies

2.4.1 Wheatbelt Planning Infrastructure Framework

The Wheatbelt Planning and Infrastructure Framework (2015) is a regional strategic planning document that provides an overview of regional planning issues and priorities. The key objectives for the Wheatbelt established in the framework are: effective infrastructure and service delivery; a diversified and adaptive economy; and management of natural amenity to support social, cultural and economic development.

The Local Planning Strategy builds on opportunities identified in the framework as being particularly relevant to the shire, such as:

- A focus on employment growth and regional services and facilities, such as for health and education.;
- Potential opportunities to establish additional horticulture sites within the Shire of Chittering, with a particular focus on citrus production. Given its soil and water resources and location relative to the metropolitan area;
- Commerce and Industry is a key focus with the establishment of the Muchea Employment Node in Muchea.
- Development of the tourism market based on the Shire's landscape and biodiversity values with the identification of the existing Chittering Valley Wine Region.
- Identification of State significant Basic Raw Materials in the form of clay in the Muchea-Chittering area.
- Possible identification of future water trading in areas with restricted water access.

A number of these objectives from the WPIF have been included as actions within the Local Planning Strategy.

2.4.2 North-East Corridor Extension Strategy 2003

This plan applies to the Shire of Chittering and the City of Swan, with the two main settlements being Bullsbrook and Muchea. The Shire of Chittering has been identified to have a future industrial node and a future town to help appropriately support growth within the north east corridor.

The Chittering New Town concept is envisaged to fall within a long-term time frame. However, as a result of the Greater Perth growth indicators the need or otherwise of this concept may need to be revisited. This will form part of the review of this Strategy. In the interim, the Shire of Chittering should allow and continue with the current rural uses, provided that any change of land use does not compromise the long-term urban development viability.

From an economic perspective the industrial node – Muchea Employment Node has been structure planned (MENSP 2011). This is the major economic focus of the Shire of Chittering and supports the objectives of the North East Corridor Extension Strategy.

2.4.3 Draft North-East Sub-regional Planning Framework 2015

The North-East Sub-regional Planning Framework (the framework) is one of three frameworks prepared for the outer sub-regions of Perth and Peel – North-West, North-East and South Metropolitan Peel (including Metropolitan South-West, Metropolitan South-East and Peel sectors) – that, combined with the draft Central Sub-regional Planning Framework, establish a long-term and integrated planning framework for land use and infrastructure provision.

The framework proposal identifies

Facilitate and support a future regional transportation network and facilitate the provision of service infrastructure:

- protect areas with regional conservation and landscape value;
- strengthen key activity centres and employment nodes to meet the future needs of industry, commerce and the community;
- Employment opportunities – MEN, Binda Place
- Regional roads and freight.

3. Local Planning Context

3.1 Council's Mission and Vision

Council's Mission is to work with and for the community to:

- Protect our natural environment
- Enhance our rural lifestyle
- Develop quality services and facilities
- Facilitate suitable development and employment opportunities

Council's Vision for the Shire is:

'By the year 2026 we will achieve diverse and cooperative sustainable communities dedicated to protecting and enhancing the rural character and natural attributes of the Shire.'

Council will achieve this through the development of:

- Sustainable economic management;
- Sustainable rural production; and
- Tourism.

Our Vision: “Living, working and playing in our friendly, thriving, diverse and well connected community, in harmony with our natural environment.”

Our Values:

- *Excellence*
- *Integrity*
- *Consistency*
- *Communication*
- *Customer Focus*
- *Respect*
- *Valuing our Staff*
- *Continuous Improvement*

3.2 Strategic Community Plan

Strategic Community Plan 2017-2022

Outcomes	Strategic Directions	Strategies
Strategic Priority 1: Our Community “An inclusive, active, safe and healthy community .”		
1.1 Active and supported community	Our communities will have services and facilities within their local community hubs	Strengthen aged ,youth and children service access through partnerships and advocacy Enhance existing recreation and social facilities for local communities
1.2 Strong sense of community	Our communities will be cohesive and connected through engagement, interaction and participation	Actively support community , volunteer groups and networks Strengthen and grow social events and festivals Activate our local centres and towns
1.3 Safe and healthy community	Our future generations will be healthy and feel safe in their community	Improve the safety of our community Advocate for improved education and health services
Strategic Priority 2: Natural Environment “A protected and bio-diverse environment, which the community and tourists enjoy .”		
2.1 Protected Environment	Our local diversity will be valued, protected and promoted as unique and valuable	Ensure the protection of our local biodiversity Develop an integrated network of walking and cycling trails
2.2 Sustainable resources	Energy and water are valued	Encourage sustainable housing

<p>2.3 Protection of life and property</p>	<p>with a focus on improved water and energy use Waste is reduced and valued through recycling and reuse Bushfire management and mitigation is a high priority</p>	<p>design Improve the sustainability of Council buildings Improve use of and access to waste disposal services Improve bushfire preparedness and recovery</p>
<p>Strategic Priority 3: Built Environment “Well planned built landscapes that are progressive, vibrant, diverse and reflect the Shire’s unique country lifestyle.”</p>		
<p>3.1 Development of Local Hubs 3.2 Safe Access 3.3 Improved amenities</p>	<p>Development of Town Centres with improved access to housing, services and facilities Diversity of transport modes Focus on improved asset management</p>	<p>Plan for new recreation and amenity facilities to support the growing population in the south of the Shire Activate local town centres through planning residential, commercial and amenity Plan for and facilitate housing choices and amenity Balance urban development with a focus on natural environment protection and open spaces Advocate for improved public transport Improve pedestrian and cycle access Improve road safety options Improve recreation and social infrastructure across the region</p>
<p>Strategic Priority 4: Economic Growth “Thriving, sustainable and diverse economic investments and employment opportunities, from cottage to large-scale industry.”</p>		
<p>4.1 Economic Growth 4.2 Local business growth 4.3 Increased visitors</p>	<p>Provision of future local employment Local businesses are supported Visitors are welcome to stay and recreate Improved environmental access as places to visit</p>	<p>Support private investment which stimulates significant and sustainable jobs growth Actively pursue development of the Muchea Employment Node Support agricultural growth, with a focus on local produce and agribusiness Encourage and support local businesses and new investments for the future Support and promote accommodation options</p>

		Support and grow events to attract visitation Facilitate , promote and support ecotourism
Strategic Priority 5: Strong Leadership “A responsive and empowering Council, which values consultation, accountability and consistency.”		
5.1 An engaged community	The community feels actively involved	<ul style="list-style-type: none"> • Encourage and promote community engagement
5.2 Strong partnerships and relationships	Working with stakeholders to build strong and sustainable relationships and to ensure the best use of Shire resources	<ul style="list-style-type: none"> • Build effective partnerships with stakeholders • Actively seek Grant Funding opportunities to support identified projects
5.3 Accountable governance	Good governance which supports efficient and effective service delivery.	<ul style="list-style-type: none"> • Ensure efficient and effective governance • Build the capacity and resources to deliver shared plans

Key priorities relevant to land use planning and development include:

- Construct a multi-purpose health centre (short term)
- Explore options to build a multi-purpose recreational centre (long term)
- Implement Local Biodiversity Strategy (ongoing)
- Explore alternative energy sources and potential water re-use (grey water and storm water) (medium term)
- Encourage sustainable housing designs, better fire protection practices, more rainwater harvesting, and the use of solar energy (short term)
- Continue to develop Bindoon as the regional centre (short term)
- Redevelopment of Binda Place as an attractive, inviting and functional main street environment (short term)
- Focus on land use planning providing diverse housing, aged, farm/rural, retail and employment (industrial node, local business) (ongoing)
- Undertake necessary scheme amendment to allow Muchea Employment Node (short term)
- Plan and promote local hubs for retail, home businesses (short term)
- Explore options for light industry area (short term)

3.3 Local Biodiversity Strategy

The Shire of Chittering Local Biodiversity Strategy was adopted by Council in April 2010 following an extensive community consultation process which involved providing a copy of the draft report to each affected landowner.

Vision: In 2050 the Shire of Chittering will have retained at least 20,000 hectares of its remaining 22,421 ha of Local Natural Areas and formally protect at least 6,328 ha within these areas.

Goal 1: Retention of natural areas;

Goal 2: Protection of natural areas;

Goal 3: Management of natural areas

The strategy identifies planning precincts (Future Town Centre, Bindoon, East Chittering, Chittering Valley, Lower Chittering, Employment Node, Muchea, Northern Agricultural) and contains recommendations for each of these precincts. The strategy also identifies Indicative High Conservation Value Areas which have been incorporated into the Local Planning Strategy maps.

Less than 10% of the Shire's native vegetation is formally protected in conservation reserves. The Shire of Chittering Local Biodiversity Strategy, adopted by Council in 2010, identified areas of high conservation value and associated targets to increase protection. Some private properties containing high conservation value areas may be suitable for future zoning to Rural Conservation. Other areas may be a priority for acquisition by the State government, for the protection of nationally significant environmental values. Future development is to be located in existing cleared areas so as to ensure the retention of as much native vegetation as possible. Rural landholders may also choose to improve the protection and management of local natural areas on their properties through government-funded programs.

Planning Implications

- IHCVAs to be protected via Rural Conservation zone
- IHCVAs to be protected via Conservation reserve on scheme map & purpose on Crown title
- Other IHCVAs may be protected via voluntary conservation covenant if eligible under DPAW or National Trust programs

3.4 Local Planning Scheme

The Shire of Chittering Local Planning Scheme No. 6 was originally gazetted on 30 November 2004.

3.4.1 Aims

The aims of the scheme are to:

- Provide **environmental protection** and enhancement of **biodiversity** and the natural resources including **land, air and water quality**;
- Protect **good quality agricultural soils** suitable for sustainable farming and horticulture from inappropriate subdivision and development for non-agricultural purposes;
- Ensure all developments comply with the principles of **catchment management**;
- Maintain the **rural lifestyle** as part of the community structure and well-being;
- Provide for, but contain, settlement growth in designated areas of a **local village character** as service centres for the local population and tourists;
- Provide for rural residential development in **controlled settlement** areas;
- Protect and improve areas of **remnant vegetation and waterways** from further degradation;
- Facilitate **vegetated wildlife corridors and greenways**, particularly along the primary **watercourses** through the Shire by means of **reserves and partnerships** with government agencies and private landholders;
- Protect the **landscape values** of any designated landscape precinct/area/zone;
- Identify and protect **basic raw materials** resources for **extraction** and set standards for **management and rehabilitation**;

- Promote employment opportunities by setting aside land for **light and service industry** development;
- Provide for a coherent and efficient **road system** throughout the Shire;
- Provide a **cohesive framework** on which to manage the development of the Shire;
- Cooperate with **community groups** to assist in sustainable enterprises for the benefit of the agricultural industry and the community as a whole;
- Provide for **essential infrastructure** consistent with and as needed to support the other aims of the Scheme.

3.4.2 Local Reserves and Zones

The Shire of Chittering Town Planning Scheme No. 6 provides for the reservation of land for the following purposes:

- Conservation
- Highway
- Major road
- Parks and Recreation
- Public Purposes: Cemetery; Civic and Cultural; Fire Fighting Station; Gravel; Land Refuse; School and Place of Assembly; Telecommunications; Water Supply
- Railway
- Water Supply

TPS6 also provides for the zoning of land for the following purposes:

Zones	Objectives
Townsite	<ul style="list-style-type: none"> • provide for a range of compatible uses within the Bindoon and Muecha townsites to provide for a high range of services, residential types, community and recreational facilities in a village with rural character; • prohibit land uses which may adversely affect the living and visual amenity of the location; • provide for the protection of the natural environment; • protect or enhance any local reserves.
Light Industrial	<ul style="list-style-type: none"> • designate land for the development of strategically located light and service industries to provide supporting service to local agriculture and to create employment opportunities.
General Industrial	<ul style="list-style-type: none"> • accommodate a range of service based and related industrial land uses such as livestock, fabrication, warehousing, wholesaling and general commercial uses which will not by the nature of their operations, detrimentally impact upon residential and other sensitive land uses outside of the General Industry zone. • to apply environmental standards and practices that protect and maintain the amenity and water and air quality of adjoining areas and support the retention and enhancement of the environmental values of the site and its surrounds. maintain the visual amenity of the area as seen from major public roads. • minimise the visual impact of development to achieve a built form that is harmonious with the surrounding area. • ensure orderly and comprehensive planning and coordinated subdivision and development.
Industrial	<ul style="list-style-type: none"> • designate strategic land areas for future industrial development and



Development	<p>employment creation purposes, and prevent such land from being used or developed in a manner which could prejudice its use for this purpose;</p> <ul style="list-style-type: none"> • ensure orderly and comprehensive planning and co-ordinated subdivision and development through the requirement for the preparation and endorsement of a structure plan in accordance with part 5.19 and any associated provisions contained in Schedule 15 of the Scheme; • ensure the coordinated provision of infrastructure, and the equitable sharing of service costs associated with subdivision and development of industrial land; • protect the amenity of adjacent properties; and • protect the environmental assets of the site.
Agricultural Resource	<ul style="list-style-type: none"> • preserve productive land suitable for grazing, cropping and intensive horticulture and other compatible productive rural uses in a sustainable manner; • protect the landform and landscape values of the district against despoliation and land degradation; • encourage intensive agriculture and associated tourist facilities, where appropriate; • allow for the extraction of basic raw materials where it is environmentally and socially acceptable.
Rural Smallholdings	<ul style="list-style-type: none"> • preserve productive land suitable for intensive horticulture and other compatible productive rural uses in a sustainable manner; • protect the landform and landscape values of the district against despoliation and land degradation. • provide lots with a minimum size of 5ha.
Rural Retreat	<ul style="list-style-type: none"> • promote land protection and environmental remediation. • permit a range of land uses which are compatible with the capability of the landform for limited agricultural, viticultural, horticultural, tourism and rural lifestyle development. • provide lots with a minimum size of 10ha.
Rural Residential	<ul style="list-style-type: none"> • designate areas where rural residential developments can be accommodated without detriment to the environment or the rural character of the area. • meet the demand for a rural lifestyle on small lots, generally in excess of 1 hectare. • maintain and enhance the rural character and amenity of the locality.
Rural Conservation	<ul style="list-style-type: none"> • maximise the long-term protection and management of significant environment values. • minimise the fragmentation of, and where deemed relevant, promote ecological linkages between, these values. • ensure that development is compatible, sympathetic and integrated with these values. • create lot/s that are of sufficient size to sustain the long-term protection and management of these values. • Encourage innovative subdivision design, such as consolidated cluster style development, that maximises the long-term protection and management of these values.
Residential R2	<ul style="list-style-type: none"> • designate areas for low density residential development in a rural setting, in which natural environmental values are conserved as far as possible.

	<ul style="list-style-type: none"> • meet the demand for lifestyle lots with a minimum lot size of 5,000m². • ensure development is sited and designated to achieve an integrated and harmonious character within each estate.
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3.4.3 Model provisions

The model provisions for local planning schemes in Schedule 1 of the *Planning and Development (Local Planning Schemes) Regulations 2015* set out the preferred types of reserves and zones and their objectives.

Reserves and their objectives from the model provisions that are similar to those in TPS6 are:

- **Environmental Conservation:**
 - *To identify areas with biodiversity and conservation value and to protect those area from development and subdivision*
 - *To identify and protect areas of biodiversity conservation significance within National Parks and State and other conservation reserves*
- **Primary Distributor Road:**
 - *To set aside land required for a primary distributor road being a road classified as a Regional Distributor or Primary Distributor under the Western Australian Road Hierarchy*
- **Public Open Space:**
 - *To set aside areas for public open space, particularly those established under the Planning and Development Act 2005 s.152*
 - *To provide for a range of active and passive recreation uses such as recreation buildings and courts and associated car parking and drainage*
- **Public Purposes:**
 - *To provide for a range of essential physical and community infrastructure*
- **Railways:**
 - *To set aside land required for passenger rail and rail freight services*

Zones and their objectives from the model provisions that are similar to those in TPS6 are:

- Residential
- Special Residential
- Rural
- Rural Residential
- Rural Smallholdings
- Rural Townsite
- Environmental Conservation
- Light Industry
- General Industry
- Industrial Development
- Commercial
- Mixed Use
- Service Commercial

- Tourism

It is recommended that the Shire's local planning scheme be updated so that the reserves, zones and their objectives are consistent, where possible, with the model provisions in the Regulations. In particular, it is recommended that the existing Rural Retreat and Rural Smallholding zones in TPS6 be amalgamated, in order to be consistent with SPP 2.5.

Planning Implications

- Model provisions for local planning schemes – reserves and zones
- SPP 2.5 zones

WATER PRONE SCA

The Local Planning Scheme 6 currently has identified Water Prone Areas - Land subject to inundation or flooding is delineated on the Scheme Map. Planning Approval is required for any development within the Special Control Area.

The purpose of this SCA is to provide guidance for future development.

- To manage development in areas where there is high risk of inundation so as to protect people and property from undue damage and where there is a potential risk to human health.
- To preclude development and the use of land which may increase the amount of nutrients from entering the surface and/or sub-surface water systems. . To ensure that wetland environmental values and ecological integrity are preserved and mentioned.

LANDSCAPE PROTECTION SCA

The Local Planning Scheme 6 currently has identified Landscape Protection Areas. The Landscape Protection Areas are:

- the Chittering Valley Landform System: for the protection of the Brockman River Catchment its biodiversity and the drainage pattern and land degradation problems;
- the Gingin Scarp: for the protection of the landform against denudation, water quality (nutrient export) and erosion;
- the northern uplands: for the agricultural quality of the undulating landforms and rural production.

The purpose of this SCA is:

- To secure the areas delineated on the Scheme Map from undue subdivision and development that would detract from the landscape value of the rural environment;
- to conserve and enhance the character of the significant landscape area; and
- to ensure land use and developments are compatible with the landscape values.

3.5 Local planning policies

The following local planning policies are currently operating under the Shire's local planning scheme:

No.	Local planning policy
1	Bindoon Townsite
2	Muchea Village

3	Poultry Farms
4	Rural Tourist Accommodation
6	Water Supply and Drainage
7	Outbuildings and Swimming pools
9	Tunnel Houses
10	Basic Raw Materials
11	Wayside Stalls
12	Additional Accommodation and Ancillary Dwellings
13	Car Parking
16	Roads and Drainage
18	Setbacks
19	Pre-painted Building Materials
20	Transported and Transportable Dwellings
21	Fire Management Plans
22	Fences
24	Stocking Rates
26	Waste Management
27	Living in Sheds
28	Public Open Space – Dedication on rezoning
29	Sea Containers
30	Registered Road Verges
31	Structures in Road Reserves
32	Development Plan
Draft	Transport Depots

3.6 Muchea Employment Node Structure Plan - map on p72 MENSF

The objective of the Muchea Employment Node Structure Plan is to designate land for future industrial development and employment creation purposes. The structure plan includes land use planning guidelines (section 6.2 and figure 8) and policy statements for individual precincts (section 6.3).

The Muchea Employment Node breaks the 1100hectare parcel into five (5) precincts:

- Precinct 1 North A – General Industry, mix of low water use type industries including rural industry, loop road.
- Precinct 1 North B – Western Australian Meat Industry Association, general low water use industries, loop road.
- Precinct 2 South – general and light industry uses.
- Precinct 3 West - general and light industry uses, Loop road.
- Precinct 4 East – subject to the extraction of state significant clay resource, existing quarry's and landfills within this precinct.

There has been an identified need for Limited light industrial development to accommodate local demand for light industrial land. In the short term this can occur on existing lots within the node subject to the provisions of the scheme. However, prior to subdivision of any lots within the Muchea Employment Node, compliance with the guidelines is required. Future consideration should also be given to a composite light industry type lot North of Bindoon town site to service the northern portion of the Shire.

Further detailed planning is required to enhance, elaborate or expand on the provisions of the structure plan, such as the preparation of local structure plans or subdivision guide plans, would be undertaken by developers, land owners and land managers who wish to develop land in the employment node in the future.

Planning Implications

- Precinct structure planning must be undertaken prior to rezoning land.
- Special Control Area stipulating development provisions is to be expanded across the whole Node.
- Local Planning Policy is to be developed stipulating design guidelines for development within the Node.

3.7 Local Laws

Local Laws under the *Local Government Act 1995* –
Extractive Industries Local Law 2014

Application for licence should also include: a map and details of the native vegetation.

Cats Local Law 2015

‘Cat Prohibited Areas’: All Conservation and Parks and Recreation reserved land designated under the Transfer of Land Act 1893 and Shire of Chittering Town Planning Scheme No. 6

‘Cat Restricted Areas – Fauna Protection Buffer Zones’: All land identified for the purposes of conservation and preservation of vegetation as designated under the Shire of Chittering Town Planning Scheme No. 6, Shire of Chittering Local Planning Strategy and any endorsed Structure Plan.

3.8 Other Council plans informing the strategy

Bushfire Risk Management Plan 2016-2021

The aim of the BRM Plan is to document a coordinated and efficient approach toward the identification, assessment and treatment of assets exposed to bushfire risk within the SoC

The objective of the BRM Plan is to effectively manage bushfire risk within the SoC in order to protect people, assets and other things of local value. Specifically, the objectives of this BRM Plan are to:

- Guide and coordinate a tenure blind, multi-agency bushfire risk management program over a five year period;
- Document the process used to identify, analyse and evaluate risk, determine priorities and develop a plan to systematically treat risk;
- Facilitate the effective use of the financial and physical resources available for bushfire risk management activities;
- Integrate bushfire risk management into the business processes of local government, land owners and other agencies;
- Ensure there is integration between land owners and bushfire risk management programs and activities;
- Monitor and review the implementation of treatments to ensure treatment plans are adaptable and risk is managed at an acceptable level.

Community Development Plan 2014-2024

Established to develop a ten-year strategy to assist for future planning and provide the Community within Chittering a strategic direction. The Strategy provides for the high-level objectives of the Shire in relation to the wider community development.

In respect to community development, the following are considered as imperatives for the Shire:

- Planning for and facilitation of provision of age appropriate services, facilities and opportunities, including planning for a growing retired population who may have insufficient retirement funds at their disposal (Aged friendly community);
- Provision of a high standard of infrastructure to cater for community demands for Sports & Recreation, community services and cultural development opportunities;
- Establishment of a policy position of co-location of services and facilities;
- Support systems for those less able to provide entirely for themselves; and
- Planning for a youth service.

Community Economic Development Plan 2015-2025

Prepared to provide a ten-year strategy that outlines broad actions aimed at creating partnerships between the community, business and industry, Council and Governments in order to promote and enhance growth and development within the Shire / region.

The Strategy will focus on five key strategic areas:

Strategy One – Enabling Infrastructure

To provide a strong physical platform on which to build and support investment.

Strategy Two – Business Support and Growth

To establish connections, provide information and actively seek to retain and expand existing businesses and attract new businesses.

Strategy Three – Visitor Attraction

Tourism can raise awareness about a place, increase investment in amenities which benefit both visitors and the community and provide opportunities for business development.

Strategy Four – Key Economic Precincts

Chittering's key economic precincts include Bindoon, Lower Chittering, Muchea, Home Business and Agricultural (including horticultural and floricultural).

Strategy Five – Regional Collaboration

Collaborative activities can range from simple arrangements such as sharing resources to more complex projects such as regional planning, providing infrastructure or shared service delivery.

Sport and Recreation Plan 2012-2022

Developed to establish a ten-year plan to help the Shire and the community determine a strategic direction for the future planning, provision and management of sport and recreation.

The plan will enable the achievement of the following objectives:

- Encourage effective and efficient administration of sport, recreation and community groups.

- Promote opportunities for groups to access funding through various sport and recreation funding programs.
- Facilitate other development opportunities for sport and recreation groups within the Shire.
- Improve the sustainability of sport and recreation organisations by providing greater support to volunteers.

Trails Network Masterplan 2013-2023

The purpose of this plan is to create a trails network which will cater for the community and visitors, with quality trails that are well promoted and linked.

The objectives focussed on by this plan include; Access, Coverage, Environment, History, Information, Interpretive Material, Maintenance, Promotion, Recreation and Standards.

Visual Landscape – Trails

<http://www.chittering.wa.gov.au/discover/trails/default.aspx#Walk>

Drive Trails:

- Wildflower Trail:
<http://www.chittering.wa.gov.au/sites/chitteringwagovau/assets/public/File/Chit%20Chat%20Trail%20Notes/WILDFLOWERS.pdf>
- Discover Golden Horizons: <http://www.chittering.wa.gov.au/discover/golden-horizons.aspx> (A Sea of Flowers, Getting Back to Nature, From Paddock to Plate, Art and Heritage)
<http://www.chittering.wa.gov.au/sites/chitteringwagovau/assets/public/File/Lifestyle/DGH%20Brochure.pdf>

Flora Roads (DPaW/RCC)

- Blue Plains Rd
- Maddern Rd

Also Roadside Conservation Values mapping on EPT

Walk Trails - Chittering Trails Network:

- Bindoon Tale Trail
- Blackboy Ridge
- Carty Reserve
- Lake Needonga Trail
- Stonehouse Trail
- Spoonbill Lake
- Wannamal Heritage Trail

Chittering Valley Wine Trail:

- <http://chitteringvalleywinetrail.com.au/thetrail.html>

Proposed Maryville Bridle Trail

Proposed Mountain Bike Trail – see Trails Network Masterplan 2013-2023

Highway Deviation strategy

The importance of informing Council and the community of the requirement to be prepared for the proposed highway deviation was identified in the Chittering Economic Development Strategy.

This document identifies and addresses negative impacts associated with the highway deviation and focusses on positioning Chittering, in particular Bindoon, so that it can maximise the positive benefits associated with the works.

3.9 Other relevant strategies, plans, policies

Ellen Brook Catchment Management Plan 2000, Local Water Quality Improvement Plan Ellen Brook Catchment 2009

The Ellen Brook Catchment Management Plan specifies actions to reduce the export of nutrients into the Swan-Canning River System by controlling over excessive phosphates and nitrates entering the surface and sub-surface water regimes.

Consultation is ongoing with Ellen Brook Catchment Management Group of which Council is an active participant. Ellen Brook Catchment Management Group is valuable vehicle by which the Council has formed cooperative partnerships with relevant government agencies and community groups. Many projects related to revegetated and streamline rehabilitation have been taken to reduce nutrient export into the Swan River.

Changes in land uses and land management practices are urged together with remedial works to arrest nutrients before they enter the watercourses. The Shire of Chittering makes an annual contribution included in the Annual Budget to assist with the daily operations of the Chittering Landcare Centre which further helps implement the objectives of this strategy.

Shire councils of Gingin, Dandaragan and Chittering all unanimously agreed to establish a Regional Alliance at their respective Council meetings in December. Recent Wheatbelt Development Commission planning identified several issues common to all three Shires which has prompted the formation of a working partnership between the three local governments. The Shire of Chittering also forms part of the Avon Regional Organisation of Councils (AROC) formed in 1999 – Chittering, Dowerin, Goomalling, Northam, Toodyay, Victoria Plains

4. Local Profile

Include the key characteristics of the local government area and the major physical, environmental, social and economic influences relevant to planning for the future. This information may be accompanied by a series of maps, which can assist with the presentation of information, as well as highlighting any relevant opportunities and constraints. The identification of information for the local profile should be based on its relevance and application to local planning, which should be highlighted in the analysis and discussion of the information.

4.1 Demographic trends

4.1.1 Population growth

The Shire of Chittering had an estimated resident population of 5,218 people in June 2014 (ABS 2015). The Shire experienced a population growth of 56.8% (or 1,890 people) since 2004 – the year that the previous local planning strategy was released. This was the greatest population growth of all local government areas in the Wheatbelt planning region, significantly higher than the Shire of Gingin (20.9% or 943 people) and the Shire of Northam (14.5% or 1,472 people).

The WA Tomorrow (WAPC 2015) median forecast (Band C) for the Shire of Chittering is 7,300 people by 2026, which represents an increase of approximately 2,770 people (or 61.1%) from the 2011 Census. This represents an average annual growth rate of 4.1%, which is lower than the Shire's growth over the period 2004-2014 (5.8%) but significantly higher than the projected growth of the Wheatbelt region as a whole (0.4%) for the same period. By comparison, the Wheatbelt Blueprint (WDC 2015) aspires to a regional population of 120,000 people by 2031 and 180,000 people by the year 2050, which would represent an average annual population growth rate of 3.7% until 2050 (based on the 2011 census population).

4.1.2 Age profile

At the 2011 Census, the median age of residents in the Shire was 42 years, which is significantly older than the Western Australian median age of 36 years. The Shire also has an under-representation of people between the ages of 20 and 34 years (10.2%, which is significantly less than Western Australian average of 21.6%). Young people leave the area for employment and higher education opportunities. The introduction of the Muchea Employment Node may assist in retaining younger sections of the population with increased employment opportunities.

In 2011, there were 1,063 people in Bindoon, 1,558 people in Lower Chittering and 680 people in Muchea. Bindoon had significantly fewer children aged 0-14 years (18.5%) and more older people aged 65 years and over (20.2%), compared with Lower Chittering (24.8% and 9.3%) and Muchea (25.6% and 8.8%) and Western Australia as a whole (19.7% and 12.3%). Bindoon has the only development for aged person's accommodation. By 2027, the projected increase of residents over 70 years of age in the Shire of Chittering will be close to 200%. Given the demographics of the Shire, another aged person's development may be required. It is proposed to create another aged persons dwelling facility as part of a joint venture between a developer and the Shire on Lot 979 GNH (old Golf Course site).

According to ABS, Youth numbers are predicted to approximately double over the next 12 years.

Retiree Housing and Aged Services Survey 2013- most respondents felt that they would remain in or relocate to Chittering when they were ready to retire. With that in mind over three-quarters of the respondents would like the option of being able to purchase or rent an 'Independent Living Unit' within the Shire. In addition to the lack of retiree housing options, access to medical facilities, public transport and care / support services were the three most raised areas of concern in both the survey comments and the community forum.

4.1.3 Education and Employment

At the time of the 2011 Census, 29.1% of people in the Shire of Chittering were attending an educational institution. Of these, 33.4% were in primary school, 29.6% in secondary school and 9.8% in a tertiary or technical institution. In terms of tertiary qualification, approximately 23% of residents possessed a certificate, 8% possessed a diploma and 7% were degree qualified.

As at March 2015, the Shire of Chittering supported a lower labour force participation rate and a moderate unemployment rate (1.8%), perhaps due to the presence of an older population, many of whom are retired or transitioning from the workforce.

There were 2,183 people who reported being in the labour force in the week before Census night in Chittering (Local Government Areas). Of these 61.4% were employed full time, 29.2% were employed part-time and 3.5% were unemployed.

The average personal income for the Shire of Chittering is \$54,777, significantly higher than that of the Wheatbelt region at \$43,807. Median weekly household income is \$1368 based on the 2011 ABS Census. \$1,415 State average

Since 2008 the major drivers of economic activity in the Shire Chittering have been construction (12.5%), agriculture (11%) and manufacturing (9.9%), mainly of chemical products. Other key employment industries in the Shire have been retail trade (7.8%), public administration (7.1%) and education (6.9%). Of the employed people in Chittering (S) (Local Government Areas), 5.3% worked in Sheep, Beef Cattle and Grain Farming. Other major industries of employment included School Education 5.2%, Metal Ore Mining 3.8%, Road Freight Transport 3.4% and Local Government Administration 2.9%.

The most common occupations in Chittering (S) (Local Government Areas) included Technicians and Trades Workers 19.1%, Managers 16.1%, Clerical and Administrative Workers 14.2%, Labourers 12.2%, and Professionals 10.6%.

The Central Midlands Sub-Regional Economic Strategy states that the economy of the Shire of Chittering is underlined by an employment self-sufficiency rate of 57% (in 2011). This, coupled with a moderate unemployment rate, indicates that there are fewer jobs in the LGA than employed persons, highlighting the presence of a drive-in/drive-out trend within the Shire.

Loss of employment on larger agricultural properties is expected as economic viability declines and traditional farming loses the capacity to support higher employment. More intense perennial agriculture is only expected to have a marginal and seasonal impact on employment due to the trend towards higher mechanisation. Value adding of primary production is in its infancy and has the potential to add significantly to agriculturally related employment.

Need for a light industrial estate to provide local services as well as accommodating industries relocating from the metropolitan area.

A challenge to the Shire outlined within the Wheatbelt Blueprint 2015 is the tendency of 15 – 19 year olds leaving the area for further education and employment prospects. This is a result of limited local employment and training opportunities and restricted transport options. Solutions to employment difficulties for the youth of the Shire will rely on collaborative and innovative solutions, improved public transport options and enhanced focus on the needs of the emerging workforce represented in the youth population.

4.2 Key issues summary – Demographic trends

Provide for retention measures to keep youth in Chittering
Provide a variety of housing options to accommodate aging population.

4.3 Settlements

overview, townsites & development areas, residential land supply, rural living land supply, rural land (RSH)

At the time of the last Census (ABS 2011), the Shire of Chittering had 1,892 private dwellings, of which 82.4% were occupied and 17.6% were unoccupied.

Standard housing is predominantly in the two main townships Bindoon and Muchea. The Country Club, Hideaway and Chittering Heights rural residential subdivisions support Bindoon. The Peters Road development supports Muchea. Other large housing components are in rural residential areas of Maryville and Wandena Rural Residential precincts with a future 250 lot residential R2 estate planned on Reserve Road. The remainder of accommodation is in the traditional farming areas.

The Shire of Chittering as part of a Joint Venture with the Department of Housing, are able to provide rental housing for people on low incomes. All applicants for Community or Senior housing must be eligible for Homes West housing. The Shire of Chittering has six rental units located in the Bindoon town site which are available for rent for community members on low incomes. eight rental units located in the Bindoon town site which are available for rent for senior community members on low incomes. As limited spaces are available, eligible applicants will be placed on a waiting list and notified as dwellings become available.

Muchea has the second highest expected housing growth in Western Australia over the next 5 years at 27.2%. This in part may be linked to the development of the Northlink Project, which will provide direct access from Tonkin Highway to Muchea nonstop. It is envisaged that this will lead to the Southern communities of the Shire being a marketable solution to people wanting to commute to the metropolitan area whilst residing on small acre farming and lifestyle blocks that are indicative of the developments in the area potentially increasing the numbers of families with children and young people residing in the Chittering Shire.

4.3.1 Housing demand

The highest population projections by WA Tomorrow (Band E) would see an average annual growth of 4.5% between 2011 and 2026, and result in 7,570 people in the Shire of Chittering by 2026. Given the Shire's current population is 5,218 (ABS 2015), and the average number of people per household in the Shire of Chittering is 2.7 (ABS 2011), approximately 870 additional dwellings would be required to accommodate the highest projected population growth in the next ten years – the timeframe of this strategy.

4.3.2 Potential stock and development status of land

The majority of the Shire of Chittering remains rural, with over 90% zoned Agricultural Resource. A large proportion of land relative to other Wheatbelt areas is zoned Rural Residential (approximately 6.5%). In terms of total area (6,882 ha) and number of lots (1,779), Rural Residential zoned land is the predominant land use for residential purposes in the Shire. By comparison, the Townsite zone covers an area of approximately 508 ha and 476 lots.

Table x: Total stock of land and number of lots for each zone (based on local planning scheme and cadastre data as at January 2016 and Valuer General's data as at July 2015)

Local planning scheme zone	Total area (hectares)	Lot count
Agricultural resource	97,131.26	1,212

Industrial development	149.07	1
Light industrial	17.33	2
Residential	77.11	8
Rural conservation	801.55	2
Rural residential	6,882.58	1,779
Rural retreat	833.92	8
Rural Smallholdings	12.81	2
Townsite	508.83	476
Total	106,414.47	3,490

Approximately 36% (183 ha of total 508 ha) of Townsite zoned land and 56% (3,824 ha of total 6,882 ha) of Rural Residential zoned land in the Shire of Chittering remains to be subdivided and/or developed (IRIS 2015).

Subdivision potential of currently zoned land has been assessed, based on the minimum lot sizes specified in the local planning scheme, and assuming 75% of the gross land area is capable of subdivision. The estimated lot yield for existing zoned land is as follows:

Table x:

Local planning scheme zone	Minimum lot size	Gross undeveloped land area	Estimated lot yield	Assuming 75% gross land available
Townsite Bindoon (R10/R30)	300m ²			
Muchea (R10)	1000m ²			
Residential R2	5000m ²		154	
Rural Residential	1ha		3,651	
Rural Smallholdings	5ha		0	
Rural Retreat	10ha		78	
Total			3,883	

Land supply has also been assessed more accurately, in terms of conditional approvals for the subdivision of land. The WAPC has given approval for 447 new lots to be created (166 of which were approved in 2016) including 366 Rural Residential, 28 Residential R2, two Residential R2.5, five Townsite, and 46 Rural Conservation (one of which is a large conservation lot). The subdivision approvals are at various stages of implementation. However, it is important to note that, of the 1,472 lots approved through conditional subdivision since 2009, only 70 have been created as titled lots.

Undeveloped and unrated Rural Residential zoned land (of lot sizes greater than 10ha): 2795ha x 0.75 = 2096

A further 303 lots have been identified from approved structure plans (Lot 26 Spice Rd, Lot 7 Gray Rd, Lot 2 Reserve Rd, Lot 9001 Rosewood Dr) that have not yet received subdivision approval. This includes 227 Residential R2, 40 Rural Residential, and 36 Rural Conservation (including a large conservation lot). Amending the structure plan for Stage 12 Maryville (Lot 9001 + Res 50220) will allow an additional 30 Rural Residential lots.

The Shire has adequate zoned land to accommodate projected population growth over the life of this strategy.

4.3.3 Key issues summary – Settlements

- Population growth
- Land supply
- Subdivision potential

It is recognised that currently the diversity of residential dwellings is limited..

Community Infrastructure and Facilities

Growth in the Shire of Chittering population and the potential expansion of Townsites and Settlements will provide the impetus for establishing a higher threshold of community facilities and services across the Shire. The enhancement of these facilities and services will assist greatly in attracting and retaining residents, workers and their families to build a strong sense of community. It has been identified that the Shire of Chittering is under resourced of community facilities for its current and future estimated growth. The Shire of Chittering has the following community infrastructure;

- Schools
- Private – IHC P-8 & Catholic Ag Collage (high school)
- Public – Bindoon Primary K-6, GinGin K-10, Bullsbrook K-12
- Wannamal Community Centre
- Bindoon Townhall
- Lower Chittering Hall
- Muchea Hall
- Chittering Tourist Centre
- Ferguson House
- Chittering Health Centre
- Brockman Centre Precinct
- Old Medical Centre
- Chinkabee Complex
- Sandown Park

The Shire of Chittering Administration Centre provides the shire's administration, health, building, planning and ranger services as well as a library. There are a number of active community and sporting organisations. These include but are not limited to Scouts, Football, Tennis, Netball and Athletics. Due to the Shire of Chittering's proximity and access to major road systems to the metropolitan centres of Joondalup and Midland, the majority of residents within the Shire access these centres.

Ensuring that there is sufficient quantity and quality of community infrastructure is important to cater for the communities recreational and community needs. The Shire has previously explored the options of Development Contribution Plans and Differential/Specialised area ratings, however to date the growth rate of the population has not warranted it.

In addition, infrastructure includes: water supply, wastewater, local infrastructure and facilities; regional infrastructure; infrastructure planning and provision, and telecommunications (mobile phone towers and service coverage).

Due to the Shire of Chittering's proximity and access to major road systems to the metropolitan centres of Joondalup and Midland, the majority of residents within the Shire access these centres. Local Medical Services- Chittering Medical Centre in Bindoon, there are three major economic focuses:

- Tourism;
- Industrial; and
- Agri-business.

Comparative Advantages

- High population growth
- Great Northern and Brand Highway (Northlink)
- Location, with excellent access to the CBD and other markets
- Chittering New Town
- Muchea Employment Node
- Affordable land both residential and industrial (comparative to Perth)
- Extensive, intensive horticulture industry
- Strong broad acre farming area (north)

Challenges

- Lack of suitable supporting infrastructure (power, water and telecommunications)
- Lack of industrial/commercial land
- High population growth
- Lack of local employment options
- Low level of access to local health services
- Limited access to local educational and training facilities
- Limited public transport
- Climate change
- Skills shortage
- High level of commuting workforce to the CBD
- Infrastructure and services

Waste Management

The Shire of Chittering has the highest growing population in the Wheatbelt, with population growing annually. There is raising concern regarding the increased waste impact on our peri-urban shire. The amount of waste is on the increase due to factors such as population growth and associated housing and other infrastructure development. Moreover it is expected that the generation of waste will be on the increase for quite some time, hence the pressure on available landfill space will be increasing rather than decreasing. A correct value therefore needs to be placed on Shire landfill space and every effort made to utilise it in the most effective manner.

The Shire of Chittering currently operates two landfills - Bindoon and Muchea.

Both Bindoon and Muchea landfills are Category 64 facilities – Class II putrescible landfill sites. A Class II site refers to an unlined landfill site designed to accept putrescible and inert wastes. This includes:

- Clean Fill
- Type 1 Inert Waste
- Putrescible Wastes
- Contaminated solid waste meeting waste acceptance criteria specified for Class II landfills (possibly with specific licence conditions)
- Type 2 Inert Wastes (with specific licence conditions)
- Type 1 and Type 2 Special Wastes (for registered sites as approved under the Controlled Waste Regulations)
- Type 2 Inert Wastes include waste consisting of stable non-biodegradable organic materials such as tyres and plastics which require special management to reduce the potential for fires.
- Special Waste Type 1 includes asbestos and asbestos cement products.
- Special Waste Type 2 consists of certain types of biomedical waste which are regarded as hazardous but which, with the use of specific management techniques, may be disposed of safely within specified classes of landfill.
- Putrescible means a component of the waste stream likely to become putrid.
- The nominated throughput for each site is less than 5000 tonnes per year.

Actions

Explore the closure of the Bindoon Landfill and Recycling Centre in favour of a transfer station versus the continued operation of the site as a landfill and recycling centre.

Ensure the rehabilitation of land previously excavated for Basic Raw Materials to ensure that voids are not left on land that can be easily utilised as waste landfills.

Recognise that all landfill sites in the Shire have potential to discharge nutrients and other pollutants to the environment directly by surface water flow or through leaching to groundwater and that contamination of groundwater by leachate from landfill sites is very difficult to remediate.

Encourage the local community to generate less waste and recycle more in order to help reduce demand for any further development of waste disposal sites in the Shire.

Consider the potential impact of waste disposal sites on land use and development on adjoining landholdings including the need to provide suitable buffer areas and establish suitable land use controls within these buffer areas.

Need to take account of land capability, natural resources and existing or proposed adjoining land uses when planning for the expansion of existing waste disposal sites in the Shire or the development of any new sites in order to minimise negative environmental impacts and avoid land use conflicts.

To minimise the amount of solid and putrescible waste produced in the Shire and to provide for the safe and effective management of all waste generated so as to not adversely affect community health, the amenity of adjoining land uses or the Shire's natural resources.

Minimise the amount of waste produced in the Shire and the need for further expanded development of waste disposal sites.

Ensure that all future development and use of land within the buffer areas of existing or proposed waste disposal sites in the Shire is compatible with the long term operation of these facilities.

Develop educational forums and campaigns to encourage recycling and waste minimisation throughout the Shire.

Work with the Department of Environment and Conservation and the Western Australian Local Government Association to implement the Chittering Waste Management Plan including performance monitoring of existing waste disposal sites.

Identify on the Local Planning Strategy maps the location of all approved and registered waste disposal sites in the Shire including the location and extent of the Department of Environment and Conservation's recommended odour buffers.

Identify the location of all approved and registered waste disposal sites in the Shire and classify them 'Public Purpose' Reserve in Local Planning Scheme No.6.

Water Resources

The Shire of Chittering is limited to water serviced areas, to Bindoon Townsite only. This water is provided and serviced by the Water Corporation, who has confirmed that it will provide enough water to accommodate proposed development growth within Bindoon.

A Secondary reticulated water source has been identified by an alternative service provider to service the proposed Reserve Road subdivision (approximately 250 lots).

Water availability - DoW Water Allocation map

The major water reserves for the Shire of Chittering include the Bindoon-Chittering Water Reserve is a PDWSA proclaimed under the Country Areas Water Supply Act 1947. A portion of the Gngangara Underground Water Pollution Control Area proclaimed under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909*

Road and Rail Infrastructure

Any future detailed design is developed on the understanding that it is not the function of highways and main roads to provide a basis for subdivision or development and that the safety and uninterrupted passage of through traffic must be given the highest priority.

The two projects that make up NorthLink WA are vital components of a wider series of improvements to the Perth Darwin National Highway. The primary objective of these improvements is to enhance freight efficiency and productivity by reducing travel time and improving journey time reliability between the Perth Metropolitan Area and the north west of Australia.

The National Highway currently follows the Great Northern Highway alignment, commencing at the intersection of Roe Highway and Reid Highway, as a two lane road. The route passes through the Swan Valley where:

- There is limited opportunity for further upgrades to the existing highway; and
- Growing traffic volumes are impacting on the community – particularly freight movements between Perth and resources projects in the north.
- The new route will provide economic benefits through improved freight efficiency and capacity, as well as improved amenity for Swan Valley residents and tourists.
- Connecting the Perth Darwin National Highway to Tonkin Highway will further increase the importance of Tonkin Highway as a north-south route, linking industrial areas such as the Airport and Kewdale precincts to the north. The Tonkin Highway Grade Separations will

complement the new route by reducing delays and improving journey reliability on the corridor.

- NorthLink WA has been planned to achieve this by:
- Developing a long term vision (the 'Ultimate Concept Plan') to ensure flexibility to cater for the traffic volumes associated with a future Perth population of 3.5 million, including a forecast for large increases in freight traffic.
- Shifting heavy vehicles from the Great Northern Highway onto the new 37 km link from Reid Highway to Muchea, to enhance safety for tourists and the community as they travel through the Swan Valley.
- Improving travel times and journey time reliability, which will improve freight efficiency and productivity.

NorthLink WA has a long term vision to cater for the traffic volumes associated with a future Perth population of 3.5 million. The Federal and State Governments have invested \$1.12 billion in NorthLink WA, which will meet the following objectives:

- Improve freight capacity, efficiency and productivity;
- Reduce urban congestion now and into the future;
- Improve road safety in line with the State's 'Towards Zero' policy;
- Maximise sustainability through economic, social and environmental responsibility;
- Improve amenity for the community, tourists and road users; and
- Create value through affordable infrastructure.
- Commuters, tourists, freight and other road users travelling between Perth and the State's north currently use the Great Northern Highway, the State's existing major northern route. While traffic volumes on the highway are increasing, there is limited opportunity for further upgrades.
- NorthLink WA will take the pressure off the Great Northern Highway by shifting the majority (around 80%) of heavy vehicles over to the new route.
- NorthLink WA will be constructed in three sections:
- [Southern Section: Guildford Road to Reid Highway](#)
- [Central Section: Reid Highway to Ellenbrook](#)
- [Northern Section: Ellenbrook to Muchea](#)

Once all sections are completed, NorthLink WA will:

- Provide a non-stop transport route between Morley and Muchea.
- Increase road capacity to improve journey times and productivity.
- Improve amenity in local communities by reducing congestion on local roads.
- Save lives by eliminating four of the State's top 15 most dangerous intersections.
- Improve amenity in the Swan Valley for residents and the 600,000 tourists who visit the area each year.

Great Northern Highway - Muchea to Wubin

In 2014, the Australian and Western Australian governments announced that detailed planning was underway for a \$385 million upgrade of the 218 km section of Great Northern Highway between Muchea and Wubin. The highway forms part of the National Highway Network and provides a strategic freight link between Perth and the State's north as well as Darwin and the Northern Territory. There are 3 major projects that will impact the Shire of Chittering; Northlink Stage 3, Muchea North and the Bindoon Bypass projects.

Project objectives;

Improve road safety	Safer route that reduces the risk of death, serious injury and damage
Increase freight efficiency	Increased efficiency in terms of vehicle loads (mass and size) and reduced delays for all traffic
Improve network reliability	Improved reliability with more consistent and predictable travel times and improved network access
Enhance travel wellbeing	Improved roadside amenities for rest and driver information
Contribute to sustainability and viable communities	Balance community concerns against the economic, community safety and network access issues
Enhance the environment	Undertake practices to help retain and enhance the environmental values of roadsides

The specific part of this project that will impact Chittering is the Muchea North section. This section involves the upgrade of 14km section of Great Northern Highway to Chittering Roadhouse. A dual carriageway is proposed for the whole of this project.

During the planning review for the Great Northern Highway: Muchea to Wubin Upgrade Stage 2, we identified that the steep grades of Bindoon Hill presented significant challenges for the potential use of 53.5 m road trains travelling through the town of Bindoon. In addition to maximising the efficiency of this major freight network route through the potential use of higher productivity vehicles, consideration was also given to improving local community safety by reducing the number of heavy vehicle movements through the town of Bindoon.

To resolve these issues, several realignment and upgrade options were considered in the vicinity of Bindoon Hill along with a number of alternative options between Muchea and Calingiri West Road. Three bypass corridor options were presented to the local community and stakeholders for feedback and consultation in mid-2016.

On completion of the community feedback and consultation period, each bypass option was carefully assessed against a range of safety, social, economic, heritage, environmental, traffic and transport efficiency criteria.

Bypass Selection

In early 2017, the former Minister for Transport endorsed  [Western Bypass Corridor A](#) for further planning and development. Read the Minister's [media statement](#) for more information.

Bypass Benefits

Although slightly longer than the other options, Western Bypass Corridor was selected as it provides a flatter and more consistent route for larger, heavy vehicles. This was seen as a significant benefit by industry. More consistent speeds will contribute to greater freight efficiencies, reduce emissions and improve road safety by reducing dangerous overtaking manoeuvres of slower vehicles. There will also be safety and amenity improvements for the local community by reducing the number of heavy vehicle movements through the town of Bindoon.

A small area of undeveloped Light Industrial zoned land is located at the intersection of Great Northern Highway and Bindoon-Dewars Pool Road, northeast of Bindoon townsite. However, with the proposed deviation of the highway, it is likely that any industrial development at this location is likely to service the local area only.

4.5 Key issues summary – Infrastructure and services

- Water corp supply to Bindoon only
- Water supply required for Muchea Employment Node
- Water supply & sewerage required for Muchea townsite
- Perth to Darwin Highway
- Community and retail services for Maryville

4.6 Local economy – overview, agriculture, BRM & minerals, industry, tourism

The local economy is based on agriculture. There is limited industry - need MEN

Agriculture

The Shire of Chittering makes an important contribution to the state's economy, producing an estimated \$29.5 million of agricultural products in 2010-11.

Significant areas of citrus plantings are established in the shire, particularly oranges, limes and mandarin trees. Some of these crops are among the highest producing in the state. Extensive planting of avocados are also present and stone fruit trees are also common.

In addition to the contribution, the shire hosts the Western Australian Meat Industry Authority (WAMIA) Muchea Livestock Centre, which is the largest dual species undercover livestock selling facility in Australia and as such significant asset to the livestock industry within WA.

DAFWA emphasised the caution regarding the use of phosphates and nitrates in the Ellen Brook catchment. Careful management of irrigation and fertilisers is required on the poorer sands in this area to both maintain production and reduced offsite impacts.

With its proximity to Perth and two major transport routes, DAFWA considered that the shire is logistically well placed to expand on value adding industries and its local planning strategies should support these enterprises.

The Shire of Chittering draft Economic Development Strategy 2014-2024 identifies agriculture as the number one of the top 5 employment industries in Chittering (24%) and agriculture is identified as a future area of opportunity. The strategy states that *"it is proposed that the Muchea Employment Node would be suitable for industries associated with transport, fabrication, warehousing, agriculture, food production, livestock and other general industry uses"*. However as many of these activities are classified under the banner of "Noxious Industry" they would be excluded, undermining the potential opportunities for future development and employment within the Shire.

DAFWA appreciates the negative connotation of the term "Noxious Industry". It is noted under the Shire of Chittering TPS "Noxious Industry" is defined as an industry which is subject to licensing as "Prescribed Premises" under the Environmental Protection Act 1986. This is a very broad category of agri-industry activities ranging from fruit and vegetable processing to dairy processing. DAFWA suggests that the Shire considers proposals on a discretionary case by case basis, taking into account best technology and best management practices as well as EPA licensing and approval processes.

DAFWA does not support the aims outlined in section 8.6.2 of the LPS which are to "maximise productive capacity of good soil" through subdivision into Rural Smallholdings. This aim is

inconsistent with the policy measures to protect rural land as set out under section 5.1 of the Western Australian Planning Commission's State Planning Policy 2.5 Land Use Planning in rural areas. Section 8.6.2 also appears to conflict with the aims of the LPS itself under Sections 5.4 and 7.2 which are designed to curtail the loss of productive soils.

Unless it is demonstrated that intensive agricultural development is being constrained by a shortage of smaller lots in the shire, it is unlikely that further subdivision can be justified on this basis. A recent lot size analysis for the shire suggests that there is currently a large proportion of small lots at <60ha. Rather than a lack of smaller sized lots in the shire, the major limitation for the development of intensive agriculture in this area appears to be the availability of adequate amounts of good quality water for irrigation.

Recent research by DAFWA shows that between 2007 and 2003 in the Shire of Chittering, there has been a reduction in the area of Rural zoned land by approximately 4% and a corresponding increase in Rural Residential, Rural Small Holdings and Rural Retreat areas. In many areas this has been for the establishment of intensive agriculture. In frequent cases, however, these smaller lots have been used only for residential pursuits, effectively removing this land from agriculture.

It has been DAFWA observation that an increase in the number of small rural lots does not necessarily translate into an increase in agricultural enterprises. Across the Peel and South West regions, more than 2400 small rural lots have been subdivided since 2000. In this time the number of horticulture enterprises has fallen from 1196 to 1145. Small lot subdivision is not increasing the number horticultural enterprises, a trend confirmed in international literature.

DAFWA ongoing research shows that successful horticultural enterprises are increasingly characterised by larger lots (with water). In 1996 the average vineyard in the Margaret River wine region was 15 hectares; by 2006 the average size had grown to 27 hectares. Research into the profitability of orchard enterprises has shown that smaller orchards (less than 20 hectares) do not generate sufficient income to employ external labour or allow economies of scale.

DAFWA supports the protection of existing processors in the region and believes that buffer zones are an important tool to prevent land use conflict. While buffers for poultry farms have been included on the Shire of Chittering's draft LPS map and text, it appears to have overlooked the 1000m buffer zone for the WAMIA site as shown on figure 8 of the Muchea Employment Node Structure Plan final report. Section 11.5 of the draft LPS (land refuse sites and industrial buffers) also does not mention that buffer zone for the WAMIA site. DAFWA recommends that the draft LPS text and map be upgraded to include this buffer zone to comply with requirements outlined in section 6.1 of SPP4.1 (State Industrial Buffer).

Muchea Livestock Centre

The Western Australian Meat Industry Authority is seeking expressions of interest from organisations seeking to establish their operations adjacent to the Muchea Livestock Centre, located at Lot 5 Muchea East Road, Muchea. The Muchea Livestock Centre is the largest undercover livestock selling Centre in Australia with an annual capacity of 120,000 cattle and 1,000,000 sheep. Operating since May 2010, it is a hub for the Western Australian livestock industry.

The Authority has approximately 40ha of land available with existing or potential road frontage available for development and suitable for a range of uses. The land is currently zoned Agricultural Resource and falls within the Muchea Employment Node Structure Plan area.

4.7 Key issues summary – Local economy

4.8 Environment – overview, geology & soils, waterways, conservation reserves, groundwater & wetlands, vegetation, threatened species

- General (pp12-13)
- Physical features, climate, NRM (p22)
- Water management
- Population & housing (pp15-18)
- Economy & employment (pp19-20)
- Retail & commerce
- Tourism & visitors
- Recreation & open space
- Community facilities
- Rural areas
- Urban design & heritage
- Traffic & transport
- Infrastructure services (settlement patterns & infrastructure on p21)
- Local geographical units (pp25-28): Northern broad agricultural area, Chittering Valley, Dandaragan Plateau, Ellen Brook Palusplain
- Broad issues (pp29-40): Environmental (Local Biodiversity Strategy, Vegetation Protection Areas), Horticulture/Agriculture, Landscape Protection, Roads/Transport, Water Supplies, Industry
- Development Strategies (pp41-57): Bindoon Townsite, Muchea Village, Wannamal, Maryville/Lower Chittering, Rural Residential Precincts, Rural Small Holdings Precincts, Rural Retreat Precincts, Agricultural Resource Area, Primary BRM Areas, Industrial Development, Future New Town Area,
- Tourism
- Tourism Statistics

Summary of Key Points from the environmental analysis research

- Tourism market in WA is growing, particular from day trip visitors with the biggest growth from those intrastate
- Overall tourists are spending more and staying longer in WA
- Most visitors to WA came from the United Kingdom followed by Singapore and Malaysia
- According to the Caravan Industry Association of Australia's 2013 statistics around 10% of tourists were RV

According to the Caravan Industry Association of Australia's 2013 statistics around 10% of tourists were RV travellers and campers. They spend around \$7 billion in Australia annually, 90% of which is spent in regional WA.

- Almost 90% 'overnight' visitors to the Wheatbelt region were from intrastate
- Domestic visitors to the Wheatbelt region stayed overnight with relatives and family or at camping/caravan grounds.
- More than three quarters of international overnight visitors in the Wheatbelt travelled alone or with family/friends where domestic visitors were a fairly equal mix of these two and also of couples and family groups (parent/s with children)

- Around three quarters of both domestic and international overnight visitors in the Wheatbelt were aged 25 years – 44 years and 45 – 64 years, in that ratio order.
- As for purpose of visit to the Wheatbelt, more than half of overnight domestic visitors were holidaying and just under a third were visiting relatives and friends.
- Less than a tenth of overnight visitors were international visitors to the Gingin-Dandaragan area.
- Overnight domestic visitors main purpose was holidaying at more than 75%
- Like the Wheatbelt, Gingin-Dandaragan overnight visitors were more than three quarters aged at 25 years – 44 years and 45 – 64 years, again in that ratio order.
- More than 80% of domestic overnight visitors to Gingin-Dandaragan were family/friends, couples or family groups

Vegetation

The Shire of Chittering is situated within the Southwest Australia ecoregion, an internationally recognised biodiversity hotspot due to its high levels of species endemism and human-induced threats. The Shire of Chittering contains significant biodiversity assets, including threatened vegetation complexes, ecological communities and species, which require special attention in strategic planning for land use and development.

The Shire lies within three major biogeographic sub-regions – the Swan Coastal Plain, the Dandaragan Plateau and the Northern Jarrah Forest - which contain unique mosaics of landforms and soils that define vegetation communities.

Approximately 30% (39,000 hectares) of the original (pre-European) extent of native vegetation remains in the Shire of Chittering. Of this, 1695 hectares are protected areas, 2,035 hectares are in State forest and other DPaW managed areas, 10,950 hectares are in State government water supply areas, and 2226 hectares are on Commonwealth land. Over 22,000 hectares of natural areas exist outside of protected areas – these are referred to as ‘local natural areas’ and are the focus of the Shire’s local biodiversity strategy, which was prepared with the assistance of WALGA’s Local biodiversity program and adopted by Council in 2010.

All native vegetation in the Shire can be categorised into 30 vegetation complexes, mapped by Heddle *et al.* (1980) for the Swan Coastal Plain, and Mattiske and Havel (1998) for the Jarrah Forest. Some of the mapped vegetation complexes have been heavily cleared and few representative areas remain at the regional (bioregion) or local (local government) scale.

A number of vegetation complexes within the Shire can be considered ‘regionally significant’:

Vegetation complexes where less than 30% of their original extent remains across their natural range and less than 10% is formally protected in conservation reserves: Bindoon, Michibin, Nooning, Reagan, Wannamal, Williams, Yanga

Vegetation complexes where less than 10% is formally protected in conservation reserves, but more than 30% of the original extent remains: Coonambidgee, Cullula, Mogumber, Mogumber South, Moondah, Reagan, Wannamal

Of these, the Nooning and Mogumber South vegetation complexes are the highest priorities for protection. They are largely endemic to the Shire of Chittering, with 99% (Nooning) and 69% (Mogumber South) of their total pre-European extents occurring within the Shire.

Four other vegetation complexes (Coolakin, Murray, Pindalup and Yalanbee 5) are considered 'locally significant'. Although more than 30% remains and more than 10% is protected at the regional scale, less than 30% of the pre-European extent remains within the Shire of Chittering.

Threatened Species and Ecological Communities

The Shire of Chittering provides important habitat for a number of rare and threatened species and ecological communities including but not limited to the Carnaby's black cockatoo, Banksia woodland communities, and three subspecies of Grevillea (refer to the Shire's Local Biodiversity Strategy Table 2 for more information). The 'Banksia woodlands of the southern Swan Coastal Plain' was recently listed as a threatened community under the Federal Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and has been mapped as occurring within the Shire. Site specific studies will be required to determine whether local examples of Banksia woodland correspond with this ecological community (refer to EPBC conservation advice). The highest priority habitat for the Carnaby's black cockatoo includes existing nesting and roosting sites, as well as foraging habitat within mapped buffers to confirmed nesting sites, trees with hollows and trees that have potential to develop hollows (refer to EPBC referral guidelines).

The Draft Perth and Peel Green Growth Plan for 3.5 million (2015) identified 'priority areas for acquisitions' that occur within the Shire of Chittering. These areas are broadly consistent with the 'Indicative High Conservation Value Areas' identified in the Shire's Local Biodiversity Strategy, and may become the focus for State government acquisition for inclusion in future conservation areas

- Ecological Linkages
- GSS Gnangara Mound Ecological Linkages
- LBS Local Ecological Linkages
- Landcare

Chittering Landcare Centre provide environmental support and advice to the Shire of Chittering, its residents and future developers. A key focus of the Chittering Landcare Centre is the protection of the Ellen Brook Catchment and the Brockman River Catchment.

Wetlands and Waterways

The Shire of Chittering has the following Nationally Important Wetlands; (MNES under EPBC Act) – Chandala Swamp, Chittering-Needonga Lakes, and Wannamal Lake System (situated just outside the Shire boundaries).

The Ellen Brook catchment is the largest sub-catchment of the Swan-Canning estuary on the Swan coastal plain. The Ellen Brook discharges into the upper Swan River estuary and is winter flowing and summer dry. The Ellen Brook catchment contributes 6 per cent of the total water input into this estuary, and it is the single largest contributor of nutrients entering the Swan River estuary.

The Ellen Brook and Brockman River catchments form the Ellen Brockman sub-region of the Swan Catchment. Together they cover 2240km² of water catchment that flows into the Swan River. Local government authorities within the catchments are the Shire of Chittering, Gingin, Victoria Plains, Toodyay and the City of Swan. The Brockman River Catchment is the largest within the Swan-Avon Catchment, covering 1520 kmsq. The Brockman River follows the Darling Scarp, flowing through the scenic Chittering valley to enter the Swan- Avon River 40 km upstream of Perth. The greatest part of the catchment lies within the Shire of Chittering. Land use in the north of the catchment is mainly

sheep and cattle grazing, and cropping of cereals, canola, lupins and hay. In the south, it is mainly horticulture such as citrus and grapes.

However the natural resource base of the catchment is already deteriorating because of the widespread clearing of native vegetation, the increased economic pressure on agricultural land to be more productive and the ad hoc subdivision for lifestyle blocks. In addition to this, the nutrient impact from surrounding stocking and agricultural practices has the highest nutrients of all sub-catchments in the Swan Canning Catchment. It contributes 28% of the total nitrogen and 39% of the total phosphorus entering the Swan Canning river system. The Ellen Brook catchment is identified as a priority catchment and is the subject of a local water quality improvement plan.

Aboriginal heritage

In Chittering, advice is that there are several areas of Aboriginal significance within the study area. Two sites are located near Muchea, the Ellen Brook: Muchea 1 and Ellen Brook: Muchea 2. Both sites are archaeological with the Ellen Brook: Muchea 1 site also being classified as an area of camping, water source and rock shelter. There also are two sites located on the banks of Chandala Brook.

Conservation Reserves

Reserve No. (Name)	Class	Purpose	Manager
42 (Burroloo Well)	C	Conservation of flora and fauna	DPaW
209	C	Landscape protection	Shire
965 (Udumung NR)	C	Conservation of flora and fauna	DPaW
2336	C	Conservation of flora and fauna	DPaW
4070 (Barracca NR)	A	Conservation of flora and fauna	DPaW
29538	A	Conservation of fauna	DPaW
32807 (Byroomanning NR)	A	Conservation of flora and fauna	DPaW
37060 (Chandala NR)	A	Conservation of flora and fauna	DPaW
41938	C	Conservation of flora and fauna	DPaW
42560	C	Foreshore management	DPaW
42561	C	Public recreation, protection of environment	Shire
42743	C	Conservation of flora and fauna	DPaW
44622	A	Conservation of flora and fauna	DPaW
44713	C	Conservation and recreation	DPaW
49943	C	Protection of the environment	Shire
50678	C	Conservation of flora and fauna	DPaW
51155	C	Wetland protection	Shire

Other Crown Reserves

Reserve No. (Name)	Purpose	Manager	Comments
8665	Gravel	Shire	
9213	School site	Dept Education	
9594	Agricultural hall & local governing	Shire	
9751	Recreation	Shire	
9937	Gravel	Shire	
10561	Park & drainage	Shire	
11260	Agricultural hall & recreation	Shire	
11604	Excepted from sale – govt require	Dept Lands	
12458	Rubbish depot & sand pit	Shire	
17109	Public park	Shire	



17753	Quarry gravel	Shire	
19648	Quarry gravel	Dept Lands	
21812	Gravel & rubbish disposal site	Shire	
24129	Parklands & picnic area	Shire	
24627	School education	Dept Education	
24724	Recreation	Shire	
24776	Gravel	Dept Lands	
27161	Rifle range	WA Rifle Assoc Inc	
27759	Recreation	Shire	
31127	Sand pit	Main Roads	
35116	Public recreation	Shire	
35610	Public recreation	Dept Lands	
38516	Public recreation	Shire	
38691	Public recreation	Shire	
38837	Public recreation	Shire	
39007	Park & drainage	Shire	
39759 (Hidden Gully Res)	Public recreation	Shire	
39953	Public recreation	Shire	
40335	Water supply	Water Corp	
40350	Gravel	Main Roads	
42008	Recreation (off-road motor sports)	Shire	
43010	Public recreation	Dept Lands	
43381	Public recreation	Shire	
43686 (Evergreen Res)	Public recreation and water supply	Shire	
44066	Public recreation	Shire	
44067	Public recreation and water supply	Shire	
44068	Public recreation	Shire	
44069	Public recreation and water supply	Shire	
44070	Public recreation	Shire	
44196	Public recreation	Shire	
44197	Public recreation	Shire	
44198	Public recreation	Shire	
44213 (Bell Hill Res)	Public recreation and water supply	Shire	
44457	Public recreation	Shire	
45225	Public recreation	Shire	
45542	Water supply	Shire	
45905	Water supply	Dept Lands	
45925	Public recreation	Shire	
45972	Fire station site	Shire	
46642	Water supply	Shire	
47912	Public recreation	Shire	
47955	Drainage	Shire	
48060	Public purposes	Shire	
48377	Public recreation	Shire	
48447	Water supply	Shire	
48484	Public recreation	Shire	
49735	Pedestrian accessway	Shire	
49739	Right of way	Shire	
49749	Pedestrian accessway	Shire	
49987	Recreation	Shire	
50161	Public recreation	Shire	

50202	Strategic firebreak	Shire	
50382	Pedestrian accessway	Shire	
50384	Public recreation	Shire	
50788	Recreation	Shire	
50925	Pedestrian accessway	Dept Lands	
51153	Pedestrian accessway	Shire	
51499	Pedestrian accessway	Dept Lands	
51533	Parks and recreation	Shire	

Landscape Character Areas

Swan Coastal Plain: Flat and poorly drained, featuring Ellen Brook and its wide floodplain. Mainly cleared for grazing. Uses along GNH include poultry farms and transport depots. Remnant trees (mainly paperbarks, swamp sheoak, marri, wandoo, pricklybark) along watercourses and roadsides, and scattered in paddocks. Viewed from Great Northern Highway and Brand Highway. When Northlink is constructed it will be elevated above natural ground level, so will provide extensive views across the plain, including views across future industrial use at Muchea Employment Node along the base of the Gingin Scarp.

Dandaragan Plateau: Gently undulating, dissected plateau, bounded on its western side by the Gingin Scarp, a moderately sloping, low scarp that runs northwest to southeast. Sandy and gravelly soils over laterite. Extensive areas of remnant vegetation including banksia woodland, as well as broadacre grazing and crops. The Gingin Scarp is a feature seen from the coastal plain, mainly from Brand Highway, although views are often blocked or filtered by intervening vegetation.

Darling Range/hills: The bulk of the shire's upland area comprises the moderate to steep hills, valleys and ridges of the Darling Range, which is located east of the Darling Fault, a line running roughly north from Maryville Downs. (The Dandaragan Plateau lies west of this line). Most of the shire's extensive rural residential estates are along the western edge of the range, where the elevations are higher. The range supports remnant jarrah and marri woodland and forest, set amongst areas cleared for grazing and cropping. Great Northern Highway passes through the range, providing views of this varied terrain. The Bindoon Bypass route will take a gentler, less dramatic route northwards through the Dandaragan Plateau.

Brockman River Valley: Within the Darling Range is the narrow, winding, steep-sided valley of the Brockman River, flowing south to the Avon River. The vegetated river corridor forms a narrow, sinuous line across the flat valley floor. The valley floor and lower side slopes are used for grazing, vineyards and citrus orchards, while the steep, upper side slopes are typically uncleared, with woodland vegetation. The narrow, winding, tree-lined Chittering Road/Chittering Valley Road has been designated as a tourist route at a State level. Views are almost entirely enclosed within the valley.

4.9 Minerals and basic raw materials

DME mapping of mineralisation & prospectivity

Current SCA surrounding Muchea clay deposits

There are currently 12 undeveloped mineral deposits within the Shire (figure 2) for bauxite, heavy mineral sand and sillimanite-kyanite. Two former gold mines and one former bauxite mine are also mapped within the Shire.

All these areas, especially the Muchea heavy mineral sand deposit and the bauxite mineralization to the east and north of the Shire are within areas zoned 'Agricultural Resource' and warrant consideration in the strategy for long term protection from conflicting land uses.

In total, there 19 granted mining tenements and five pending mining tenements, wholly or partly within the Shire, but no active State Agreements (figure 4). Most of the mining companies are targeting bauxite associated with lateritic deposits east of the Darling Fault. Within the Perth Basin, tenements are targeting heavy mineral sands.

There is one granted petroleum title and one pending petroleum application wholly or partly within the Shire of Chittering (figure 5), but currently no geothermal energy titles.

These are the different types of mining tenements prescribed under the Mining Act 1978: Prospecting Licences (Sections 40 to 56), Special Prospecting Licences for Gold (Sections 56A, 70 and 85B), Exploration Licences (Sections 57 to 69E), Retention Licences (Sections 70A to 70M), Mining Leases (Sections 700 to 85A), General Purpose Leases (Sections 86 to 90), Miscellaneous Licences (Sections 91 to 94).

The holder of an exploration license may in accordance with the license conditions, extract or disturb up to 1000 tonnes of material from the ground which includes overburden. In relation to mining for minerals other than gold, silver and precious metals, does not include land alienated before 1 January 1899. Land under private ownership alienated prior to 1 January 1899 is controlled through the Planning and Development Act 2005.

Basic Raw Materials

Basic raw materials (BRM) are defined as a mineral when on Crown land, and hence the need for mining leases under the *Mining Act 1978* for commercial basic raw material extraction on Crown land. On private property, basic raw material extraction and sale is authorised by the Shire through the grant of Extractive Industry Licences (EIL). Extraction of basic raw materials is required for all new infrastructure (roads, telecommunications etc.) to be built in the Shire.

There are a total of 27 BRM quarries and deposits within the Shire (figure 3) for clay, sand and gravel resources , with 16 classified as operating, five proposed for sand and gravel, one is undeveloped and five are classified as shut.

Based on information available there are currently nine Extractive Industry Licences for clay, sand and gravel. Department Mining Petroleum is also aware of nine Crown reserves for the purpose of BRM, and has issued mining tenement M70/635 for the extraction of clay within R 24776.

Department Mining Petroleum has compiled areas of 'Regionally significant basic raw materials' from previous geological mapping using various thresholds to identify those areas that have the potential to provide a long-term supply of these materials. Thus, these areas are primarily those with the largest potentially extractable quantities taking depth to water table into account where appropriate. A range of practical high level planning and mining constraints were applied, but these do not take into account any constraints imposed by State and Commonwealth environmental or heritage legislation.

4.9.1 Key issues summary – Natural environment

- Bush fire hazard

- Local biodiversity strategy & IHCVAs
- Rural Conservation zoning
- Carnaby's cockatoo habitat
- Ellen Brook

5. Planning Issues and Implications

Analysis of key issues: Key planning issues identified through the local profile and planning context should be reviewed, and options to address each issue considered. This analysis should be undertaken in the context of relevant state and regional policy, opportunities and constraints and the significance of each issue.

The analysis should include an explanation of each issue, which interests are affected and the areas that are particularly affected. Consideration should also be given to the urgency of the matter and the information available to establish future direction. This is a fundamental element of the strategy development process and needs to be given particular attention.

Opportunities for & constraints upon development

- Mining/BRM: Bauxite mining, Mineral deposits conflict with IHCVAs
- Biodiversity: Local Biodiversity Strategy – protection & retention targets
- Bushfire hazard
- Land capability & nutrient management for Ellen Brockman catchment
- Protection of existing agriculture/horticulture
- Water supply for new/existing residential & agriculture
- Water allocation vs utilisation – potential for transfer of water rights (licenses) – e.g. private water service provider in Muchea area (MEN, Reserve Rd, etc.)
- Servicing expansive rural living areas, e.g. commercial sites
- Employment – significance of MEN etc.
- North Link intersection with Gt Nth Hwy – potential for future development (other than MEN)

Key Trends

- Industrialisation of parts of Chittering's landscape (Muchea Employment Node and along highways) due to the shire's peri-urban location, at the junction of Brand and Great Northern Highways
- Upgrading Great Northern Highway as part of Perth-Darwin Highway
- Decline of orchards in the valley due to economic conditions
- Additional telecommunication towers along key road corridors, due to population growth and increased road traffic
- Tourism ventures in valley and hills landscapes, focussed on vineyards and rural accommodation
- Shire's efforts to attract visitors include creating multiple drive trails along existing roads, with signage and other structures such as sculptures

Issues

- Pressure for transport depots, poultry farms and other industrial uses along major roads conflicts with tourist and residential use that is based on the area's rural landscape character

- Muchea Employment Node will form a very prominent gateway to Chittering from the grade separated intersection between GNH and Brand Highway, conflicting with the shire's tourist branding based on rural character
- Upgrading the highway reduces its connection with the surrounding landscape, due to loss of roadside trees and reduction of elevated portions of the route
- When the Bindoon Bypass is constructed there will be a need for significant quantities of fill material and gravel
- Loss of orchards is reducing the attractiveness of the valley landscape
- Additional telecommunications towers impacts on rural landscape character
- Reduced amenity on State and local tourist routes, such as increased traffic leading to removal of roadside trees for road widening or constructing higher capacity powerlines etc
- Development in the southern hills area and Brockman valley for tourism and residential use has the potential to alter rural landscape character
- The lack of leafy rural character in Bindoon detracts from the town's potential as a node along the tourist drive route
- The proliferation of overlapping drive trails may lead to confusion, discouraging potential visitors

Strategies

- Separate tourist traffic from industrial areas and other heavy vehicle routes
- Use planning mechanisms to maximise tree retention and screen planting in industrial uses
- Minimise the location of BRM extraction, and industrial uses such as transport depots, along major travel routes
- Avoid locating telecommunications towers where they are visible along primary tourist routes
- Encourage orchardists to retain their fruit trees
- Discourage tourist uses from locating on tourist routes that would need to be upgraded to handle the additional traffic generated
- Simplify the network of tourist drive trails

Actions

- Identify alternative return route/s to Great Northern Highway, for tourists who drive north on the Chittering Tourist Route.
- Under the LPS, develop a visual landscape planning policy to provide guidance on tree retention, screen planting, setbacks and other matters related to landscape protection
- Under the LPS, specify a Special Control Area that incorporates the most visually sensitive landscape in the shire, with provisions aimed at protecting valued rural landscape character
- Reorganise and re-badge the network of tourist drive trails to consolidate signage, maps and information into single products that incorporate all attractions
- Provide financial incentives and other support for orchardists
- Reject development applications that may generate sufficient traffic on tourist routes to require road upgrades

The future economic growth and development will be a key driver and underpin the Shire's capability to deliver services to meet community's expectations. Limited business, retail and industry will not sustain future populations. Our key challenge is lack of infrastructure to support growth.

Land supply for the lifetime of the Strategy can readily be accommodated in and around the Bindoon town precinct and the nominated rural residential areas and that doing so is the preferred direction



of growth in the Shire. The need for a New Town remains a long term prospect outside the lifetime of the Local Planning Strategy. The State government may review or update the NE Corridor Extension Strategy, particularly in the context of Directions 2031 and SPP 3 (and the alignment of the Perth-Darwin Highway) which both promote consolidation of urban areas. The findings of the State Government review can then be reflected into any subsequent local planning strategies or strategy amendments.

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- Western Australian Planning Commission (2015) Western Australia Tomorrow, Population Report No.
- **No. 10, Medium-term Forecasts for Western Australia 2014-2026 and Sub-regions 2016-2026**
- **No. 9, Long Term Population Forecasts for Western Australia, 2031 to 2061**
- **No. 8, 2006-2026, July 2012**
- Wheatbelt Development Commission (2015) Wheatbelt Blueprint

APPENDICES

MAPS

- Local Planning Strategy map
- Location
- Cultural Heritage – local sites
- Settlement
- Transport
- Industrial Areas
- Reserves
- Biodiversity
- Wetlands and Waterways
- Mineral Resources & Mining
- Basic Raw Materials
- Visual Landscape – viewsheds
- Bushfire Risk Management
- Planning Precincts
- Implementation plan – Natural environment? Built environment?



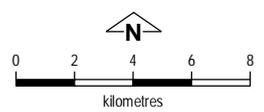
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T: 08 9576 4600 F: 08 9576 1250
E: chatter@chittering.wa.gov.au
www.chittering.wa.gov.au

Office hours: Monday to Friday
8:30am - 4:30pm

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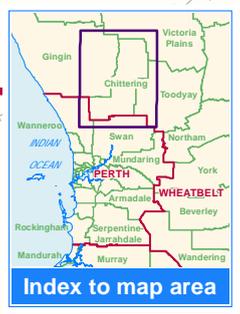
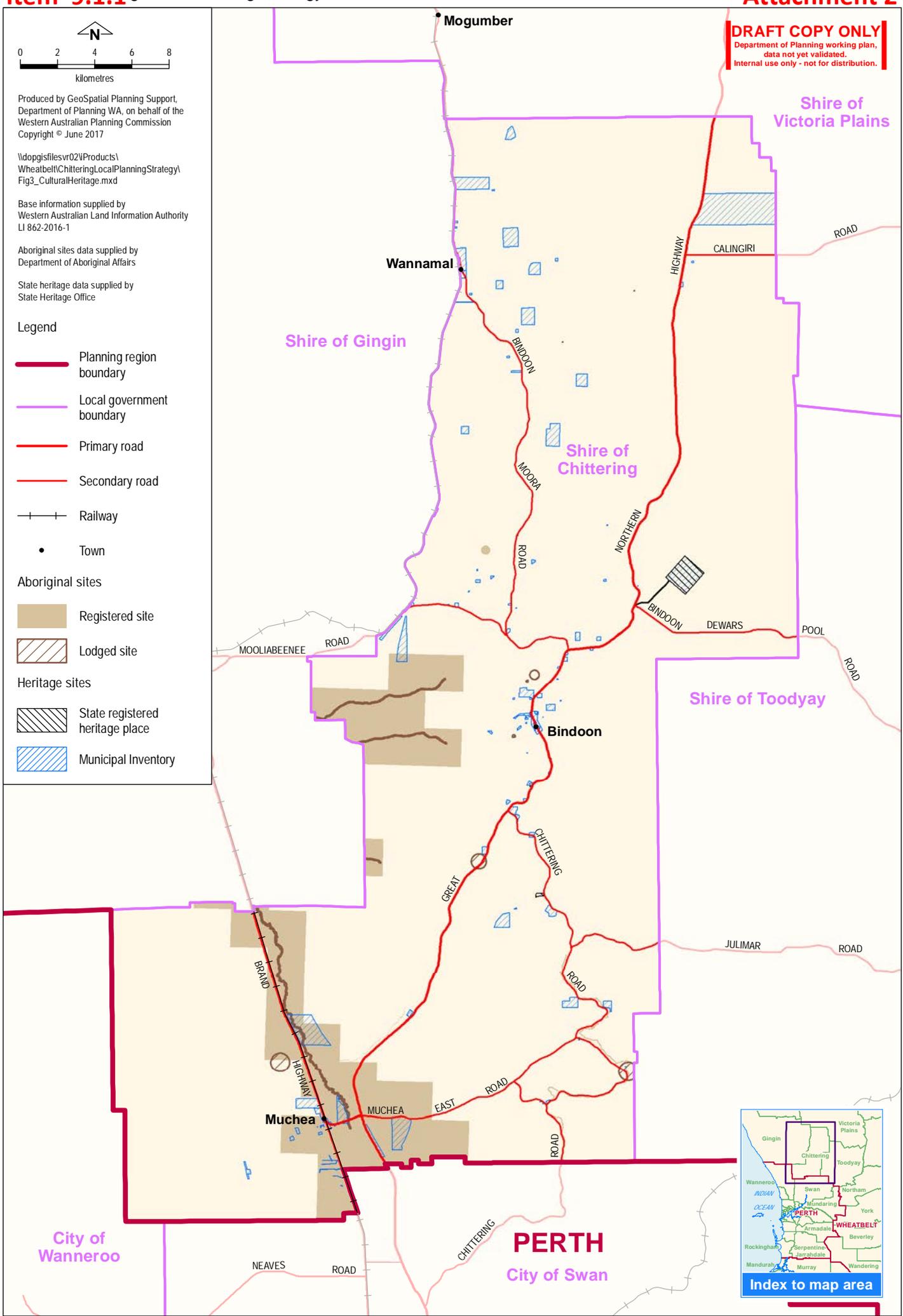
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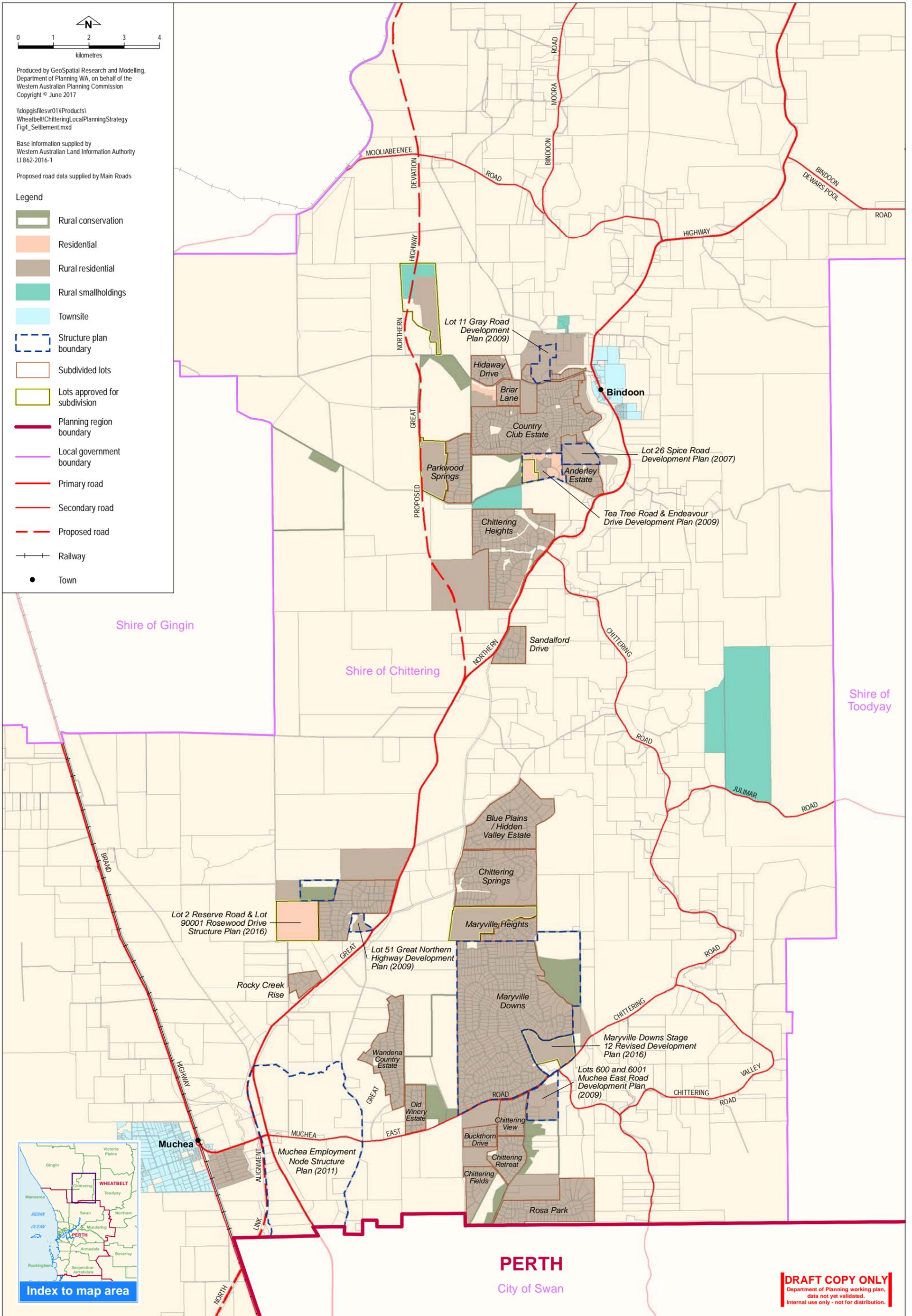
Aboriginal sites data supplied by
 Department of Aboriginal Affairs

State heritage data supplied by
 State Heritage Office

Legend

- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Railway
- Town
- Aboriginal sites**
- Registered site
- Lodged site
- Heritage sites**
- State registered heritage place
- Municipal Inventory

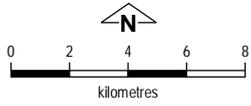




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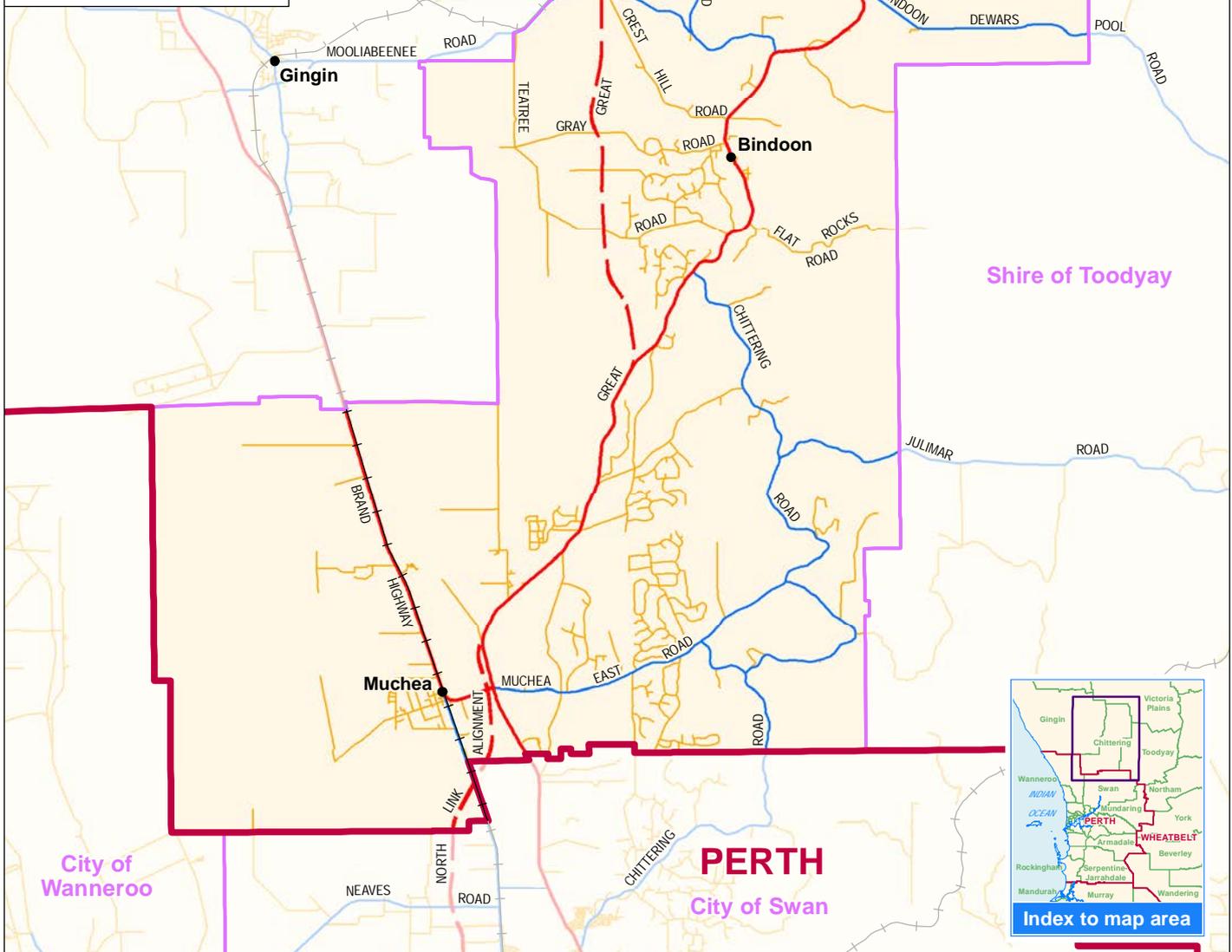
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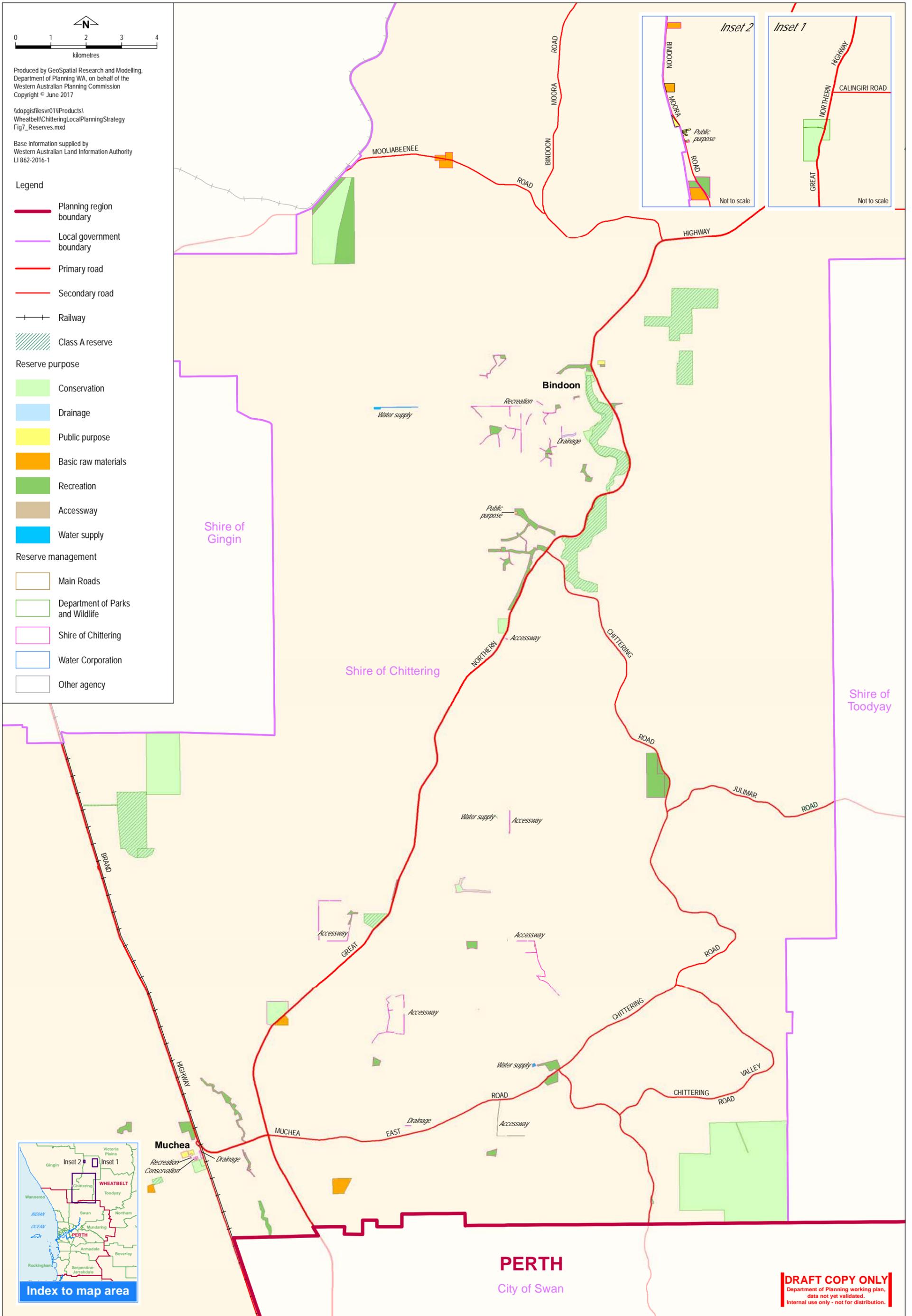
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North Link alignment data supplied by
Main Roads, Western Australia

Legend

- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Minor road
- Proposed road
- Railway
- Town

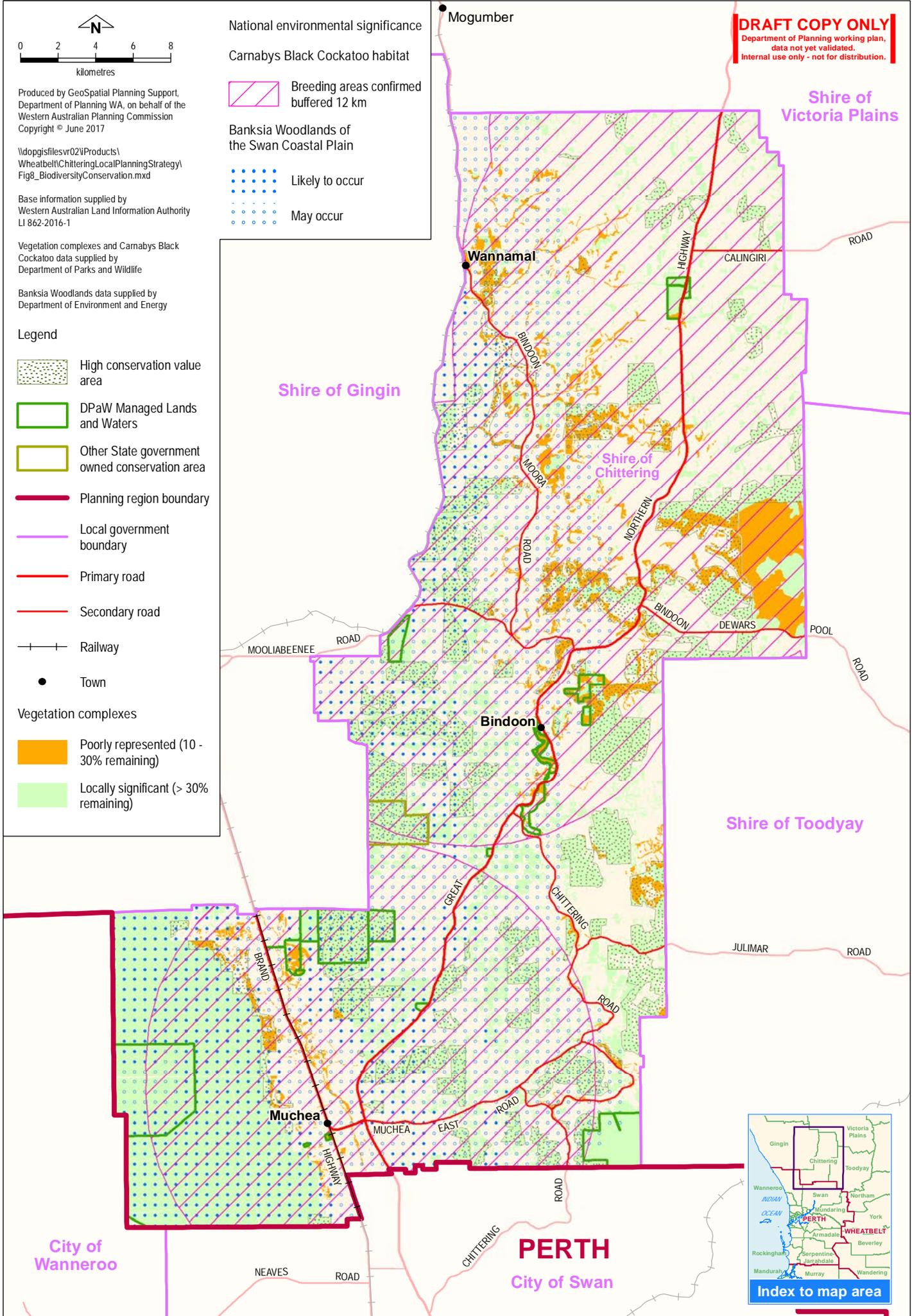




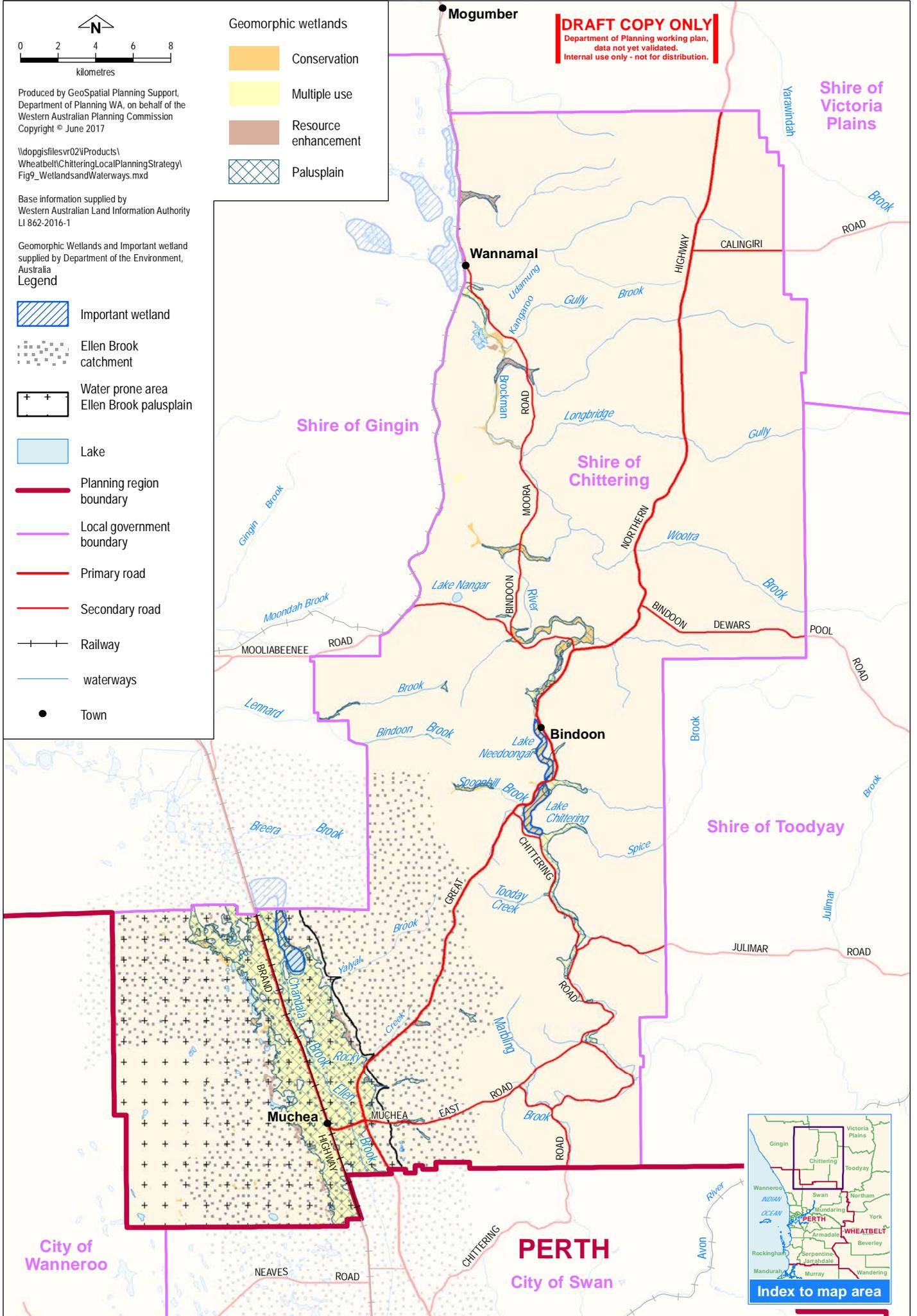
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Reserves

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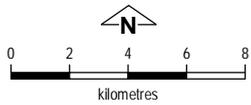


Biodiversity conservation



Wetlands and waterways

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 Fig11_BasicRawMaterials.mxd

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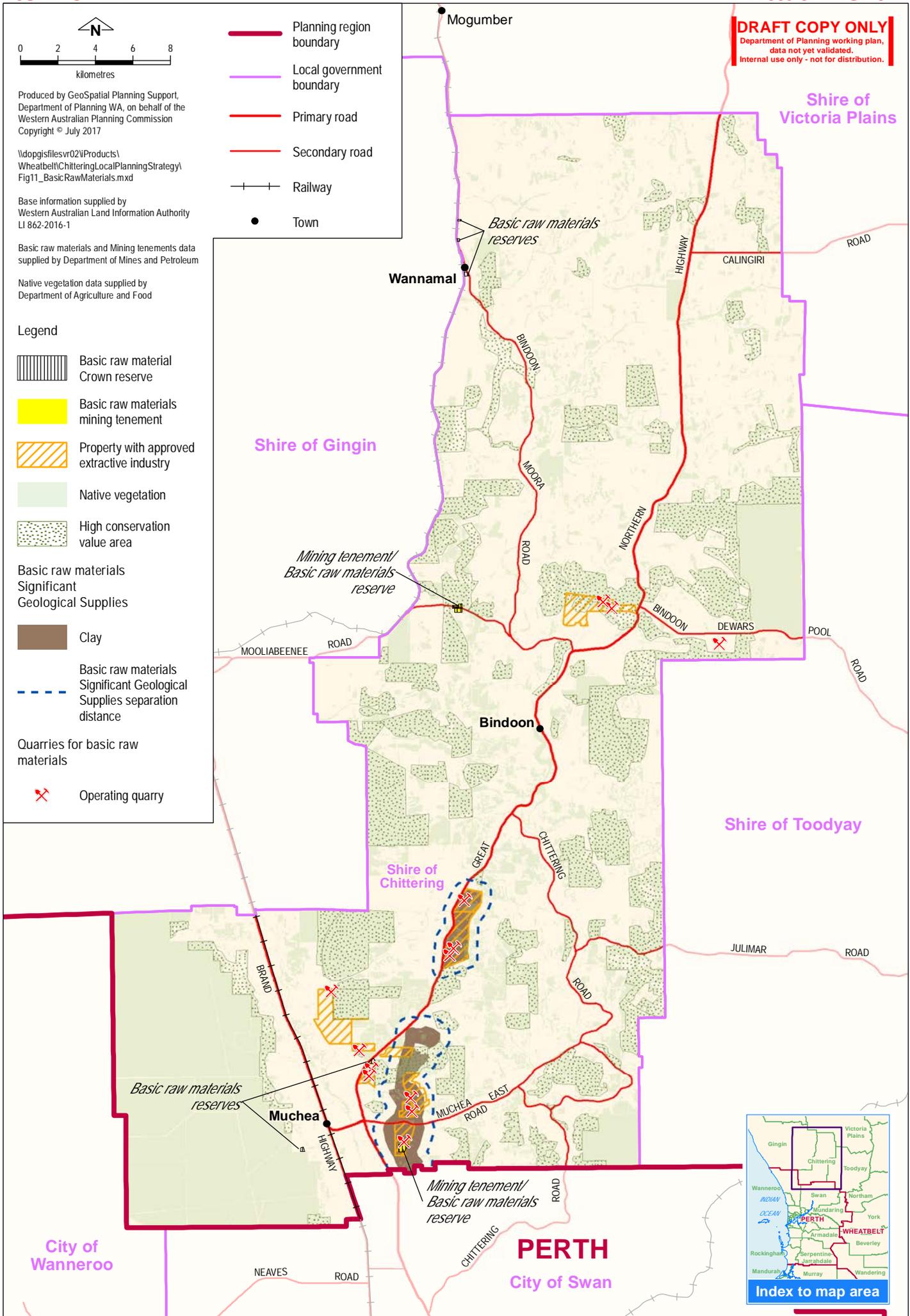
Basic raw materials and Mining tenements data
 supplied by Department of Mines and Petroleum

Native vegetation data supplied by
 Department of Agriculture and Food

Legend

- Basic raw material Crown reserve
- Basic raw materials mining tenement
- Property with approved extractive industry
- Native vegetation
- High conservation value area
- Basic raw materials Significant Geological Supplies**
- Clay
- Basic raw materials Significant Geological Supplies separation distance
- Quarries for basic raw materials**
- Operating quarry

- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Railway
- Town



Shire of Toodyay

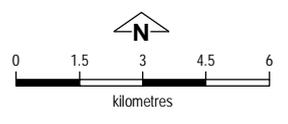
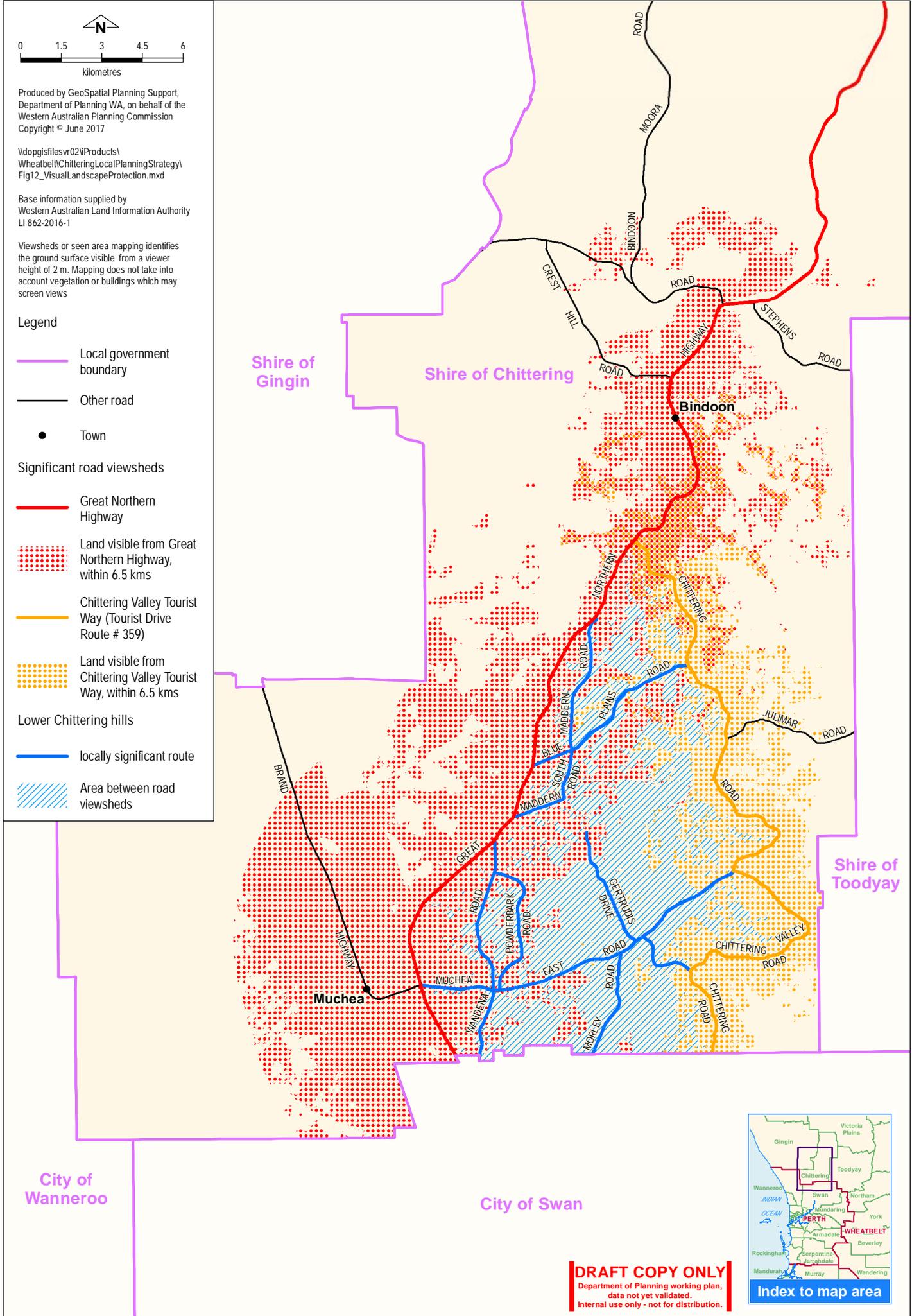
Shire of Chittering

City of Wanneroo

PERTH
 City of Swan



Basic raw materials



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Fig12_VisualLandscapeProtection.mxd

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Viewsheds or seen area mapping identifies
the ground surface visible from a viewer
height of 2 m. Mapping does not take into
account vegetation or buildings which may
screen views

Legend

- Local government boundary
- Other road
- Town

Significant road viewsheds

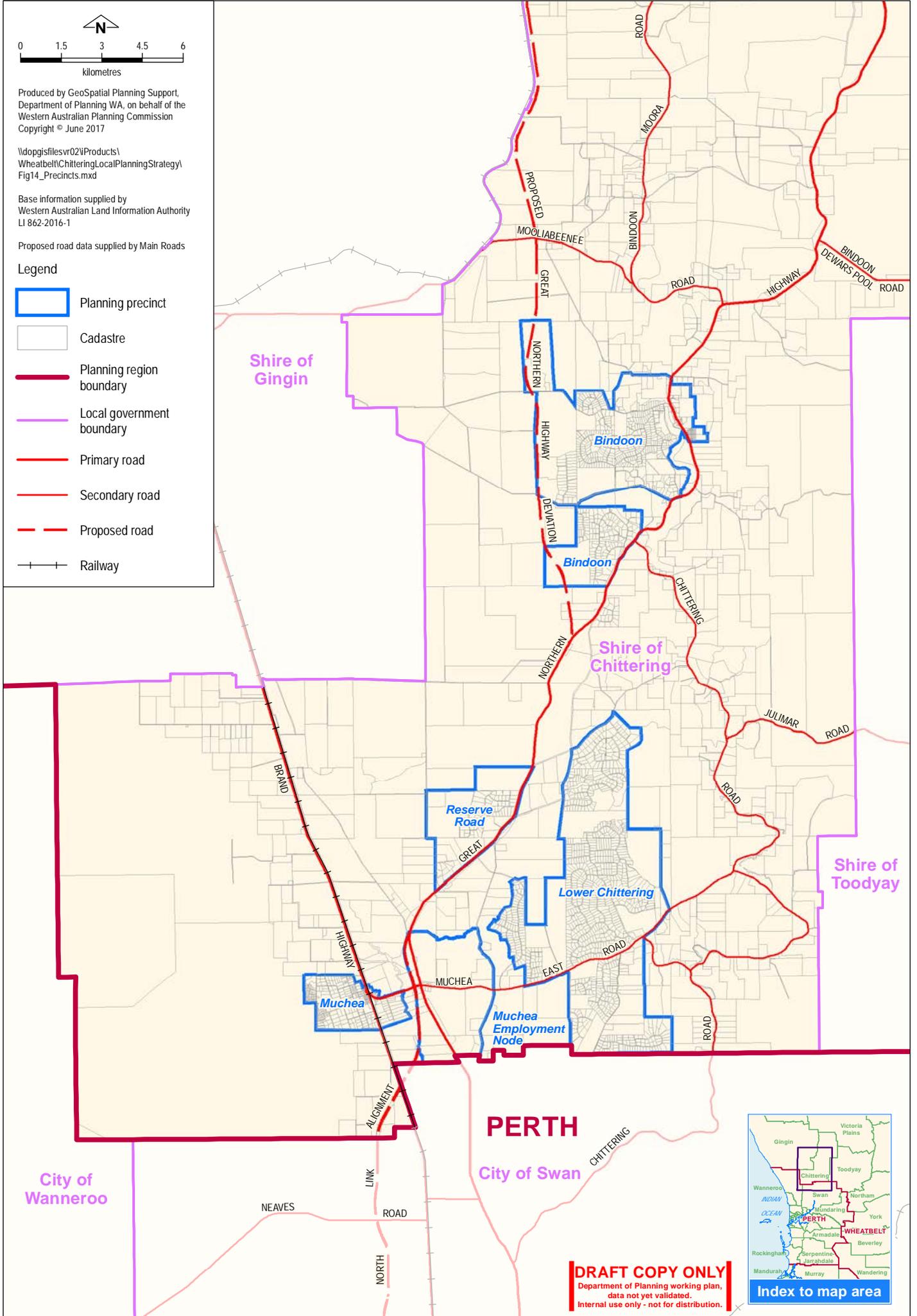
- Great Northern Highway
- Land visible from Great Northern Highway, within 6.5 kms
- Chittering Valley Tourist Way (Tourist Drive Route # 359)
- Land visible from Chittering Valley Tourist Way, within 6.5 kms

Lower Chittering hills

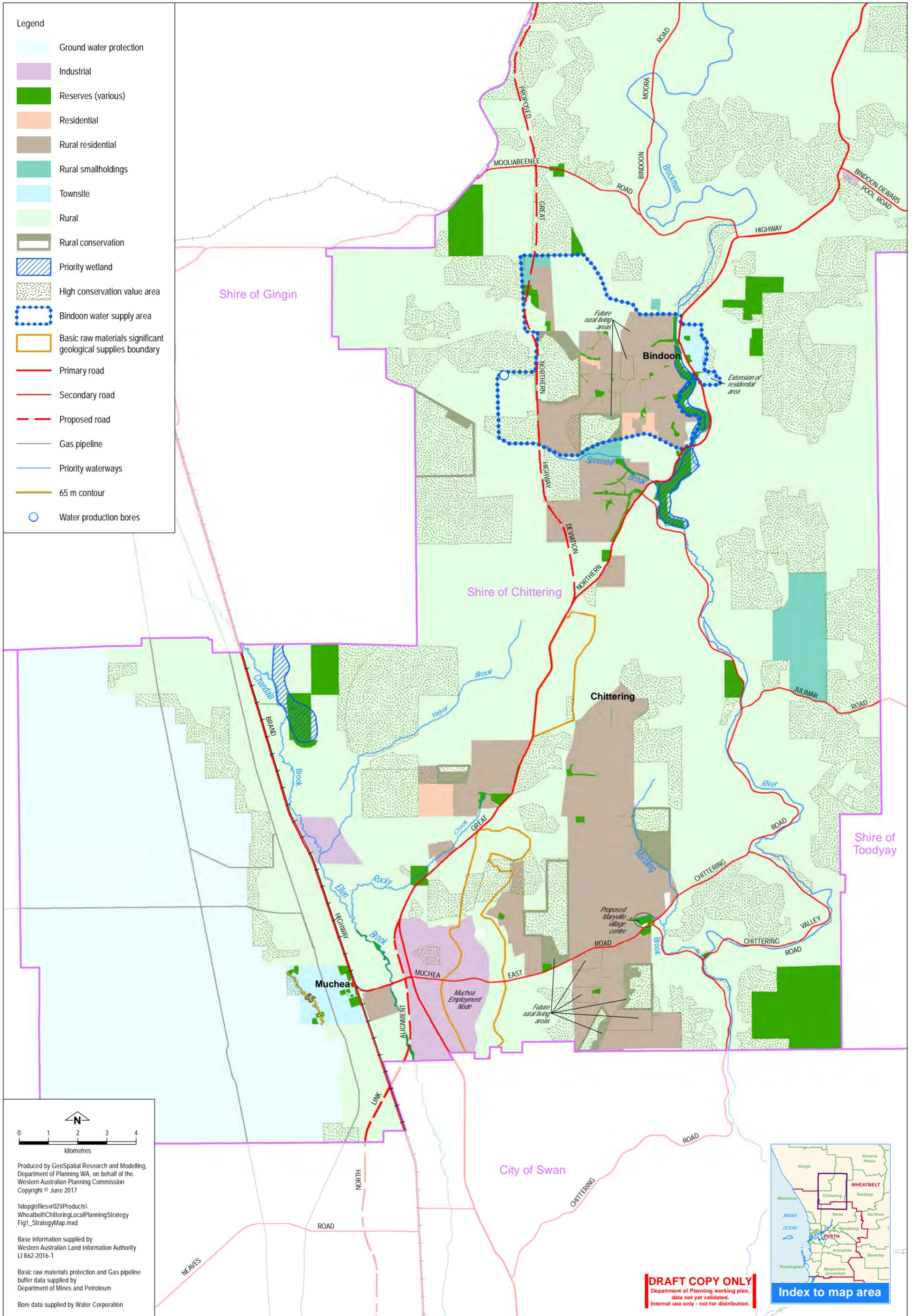
- locally significant route
- Area between road viewsheds



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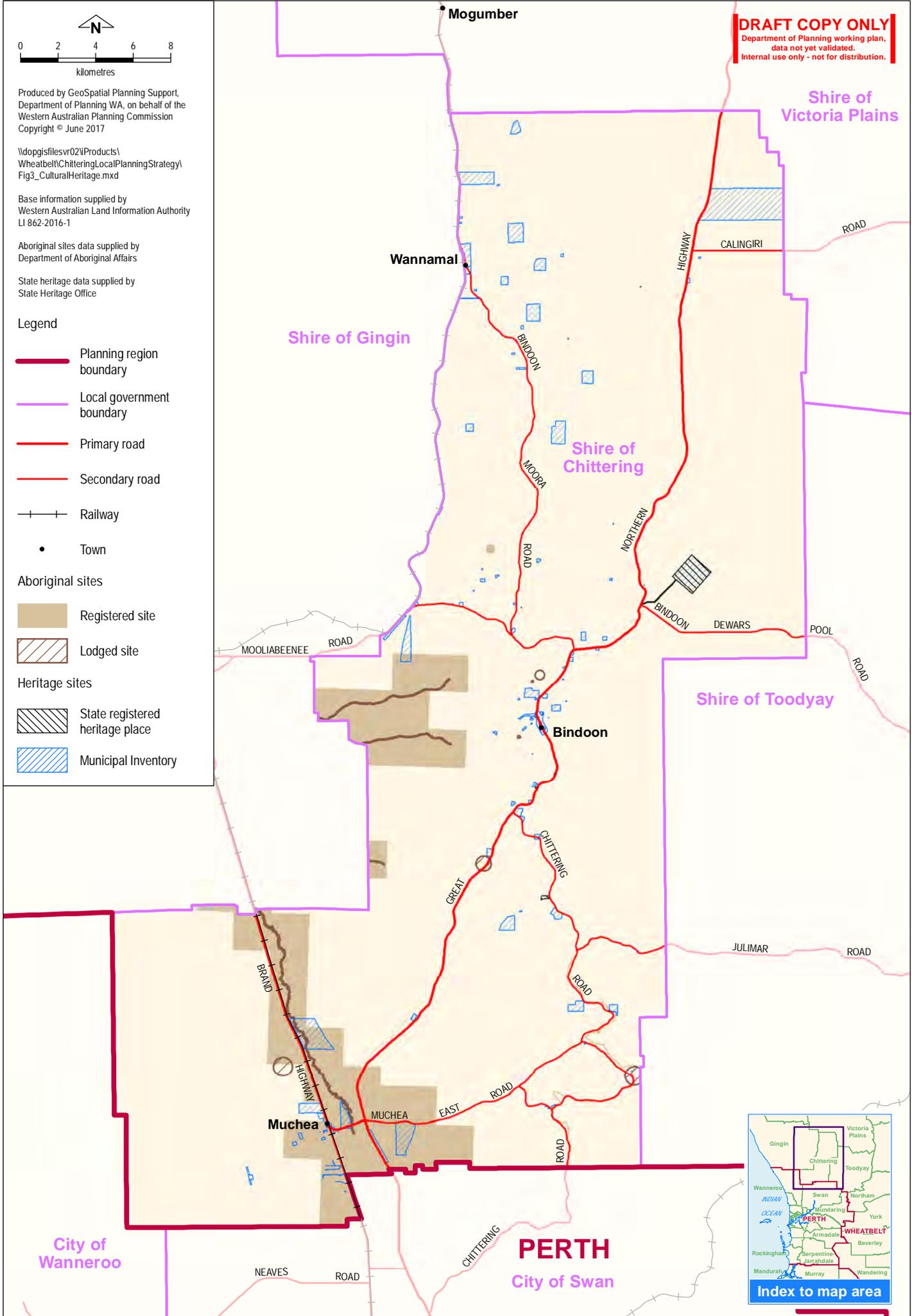


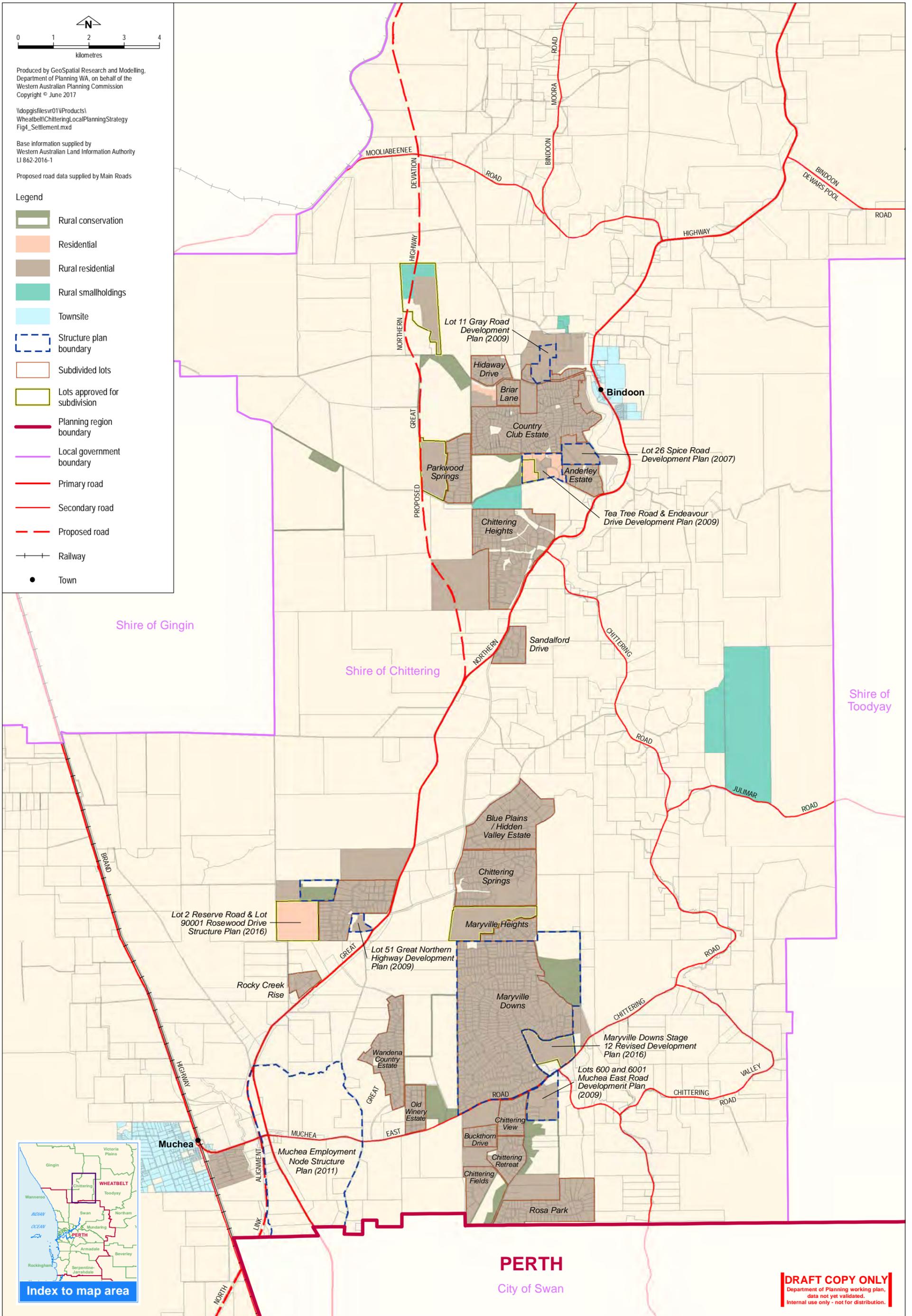
Planning precincts



Shire of Chittering Draft Local Planning Strategy 2017

Figure 1

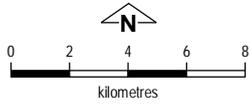




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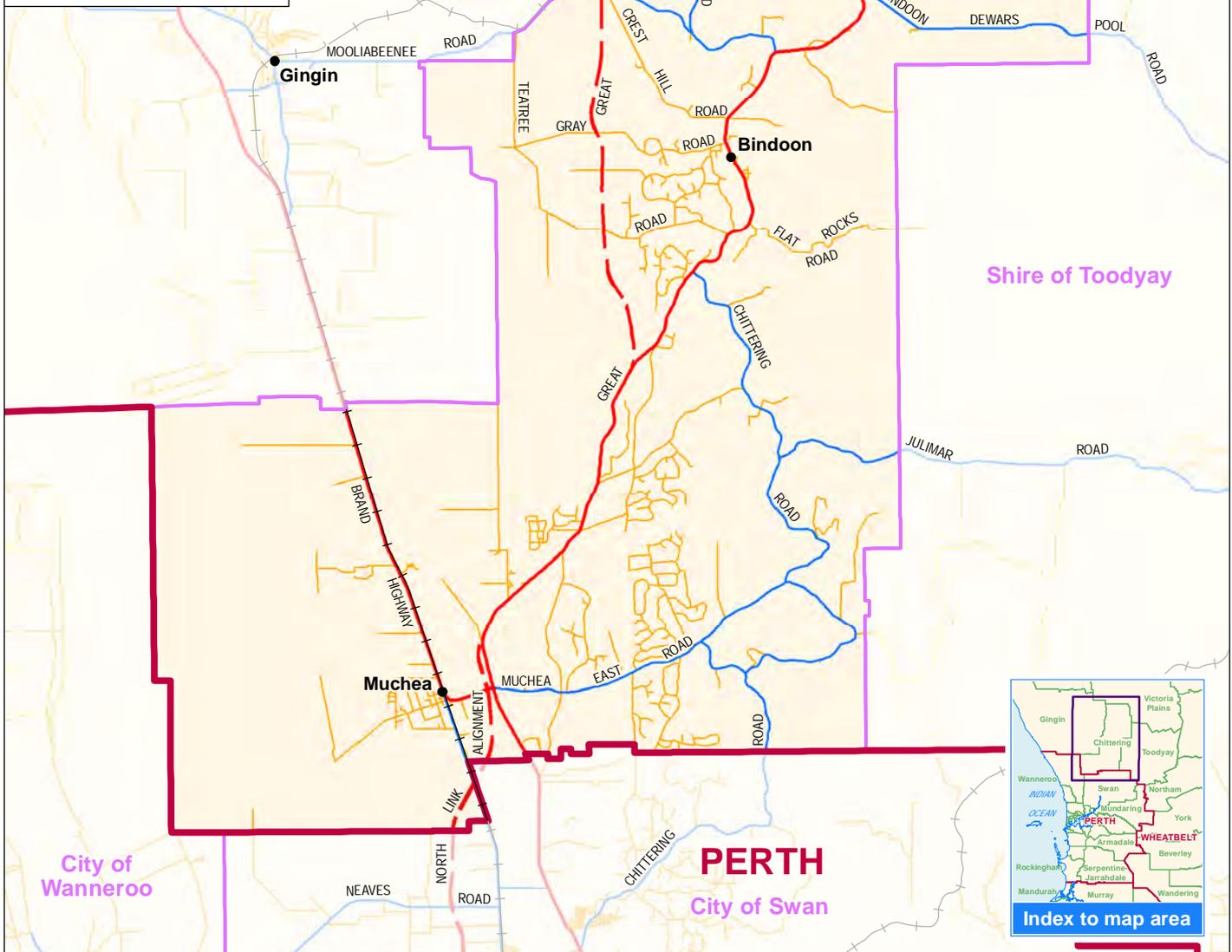
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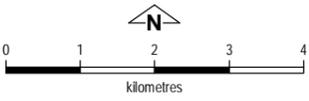
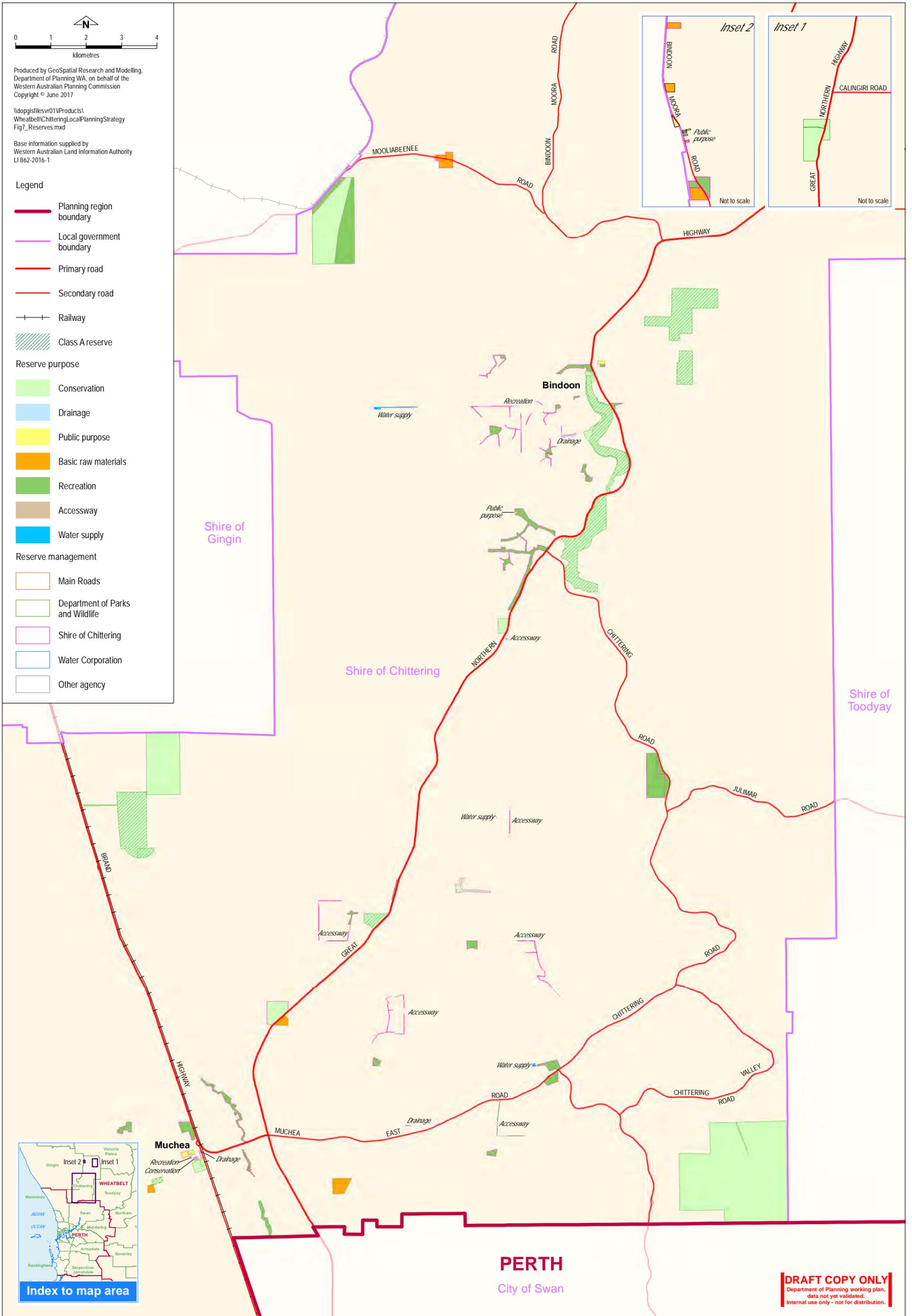
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Legend

- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Minor road
- Proposed road
- Railway
- Town



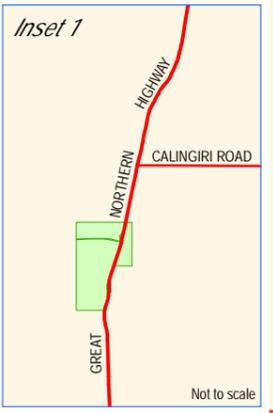
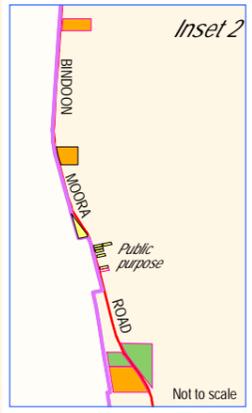


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Fig7_Reserves.mxd

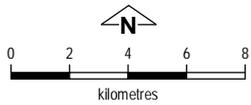
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- Legend**
- Planning region boundary
 - Local government boundary
 - Primary road
 - Secondary road
 - Railway
 - Class A reserve
- Reserve purpose**
- Conservation
 - Drainage
 - Public purpose
 - Basic raw materials
 - Recreation
 - Accessway
 - Water supply
- Reserve management**
- Main Roads
 - Department of Parks and Wildlife
 - Shire of Chittering
 - Water Corporation
 - Other agency



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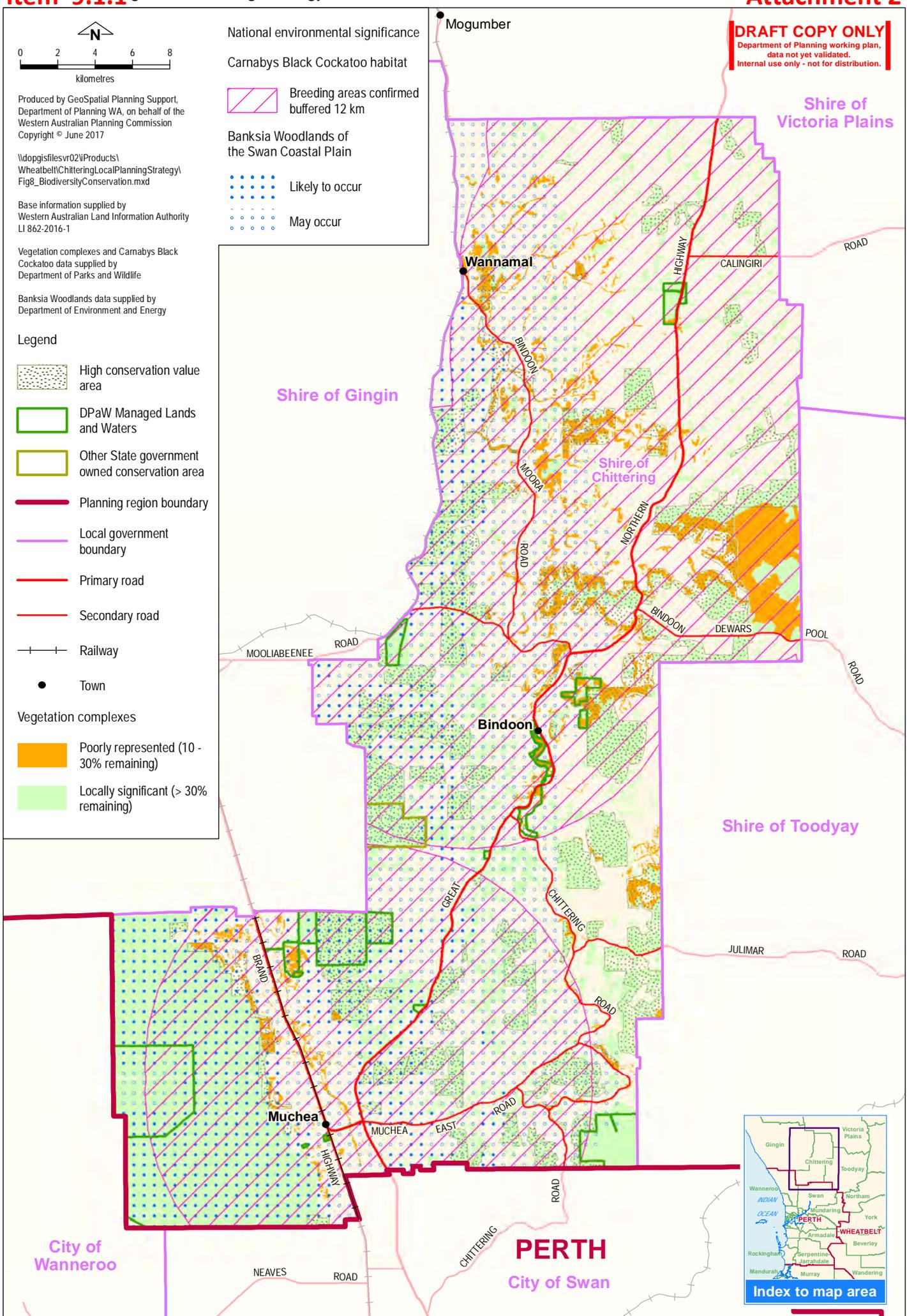
Vegetation complexes and Carnabys Black
 Cockatoo data supplied by
 Department of Parks and Wildlife

Banksia Woodlands data supplied by
 Department of Environment and Energy

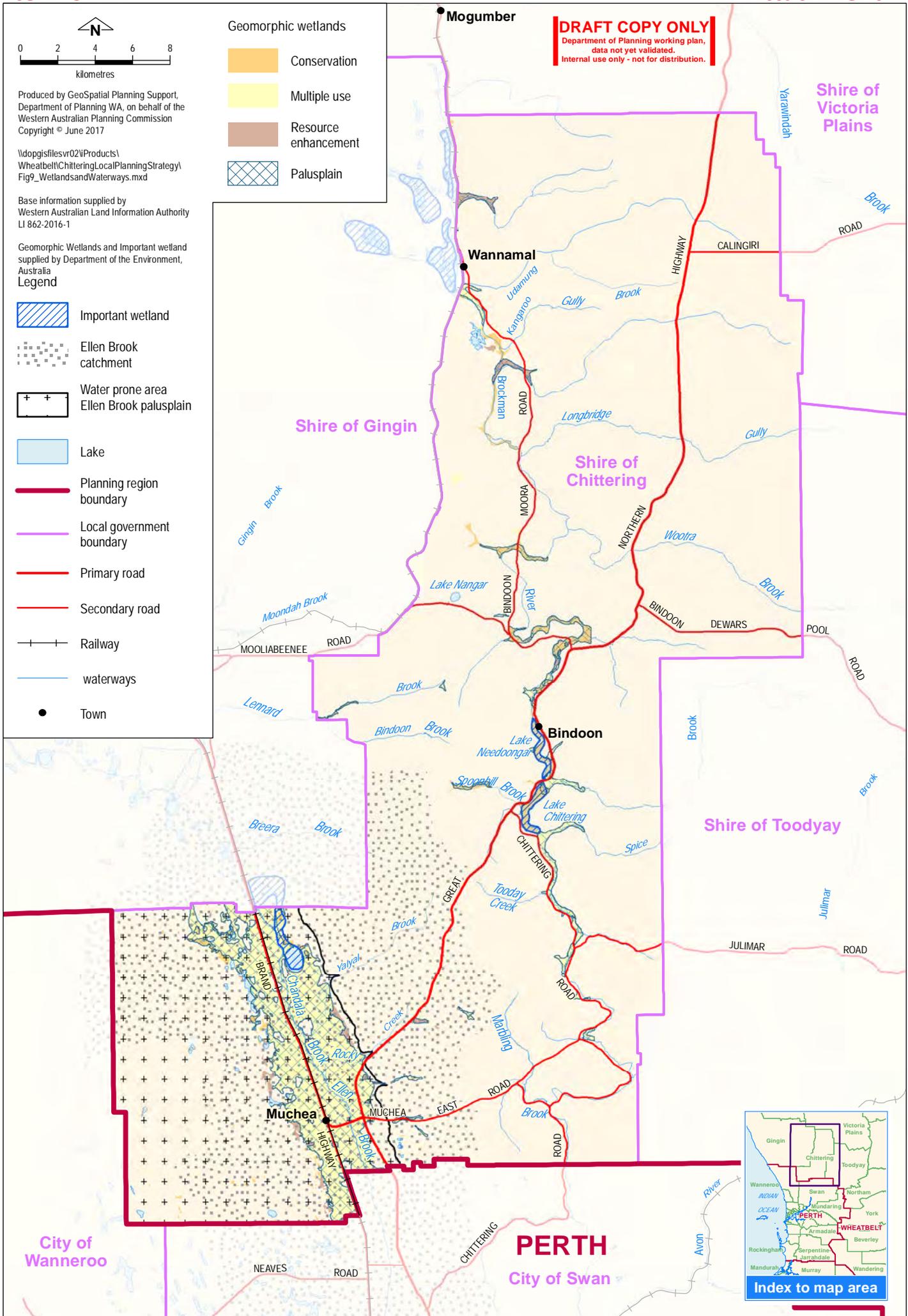
Legend

- High conservation value area
- DPaW Managed Lands and Waters
- Other State government owned conservation area
- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Railway
- Town
- Vegetation complexes**
- Poorly represented (10 - 30% remaining)
- Locally significant (> 30% remaining)

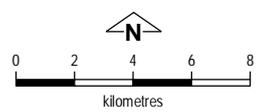
- National environmental significance
- Carnabys Black Cockatoo habitat
- Breeding areas confirmed buffered 12 km
- Banksia Woodlands of the Swan Coastal Plain
- Likely to occur
- May occur



Biodiversity conservation



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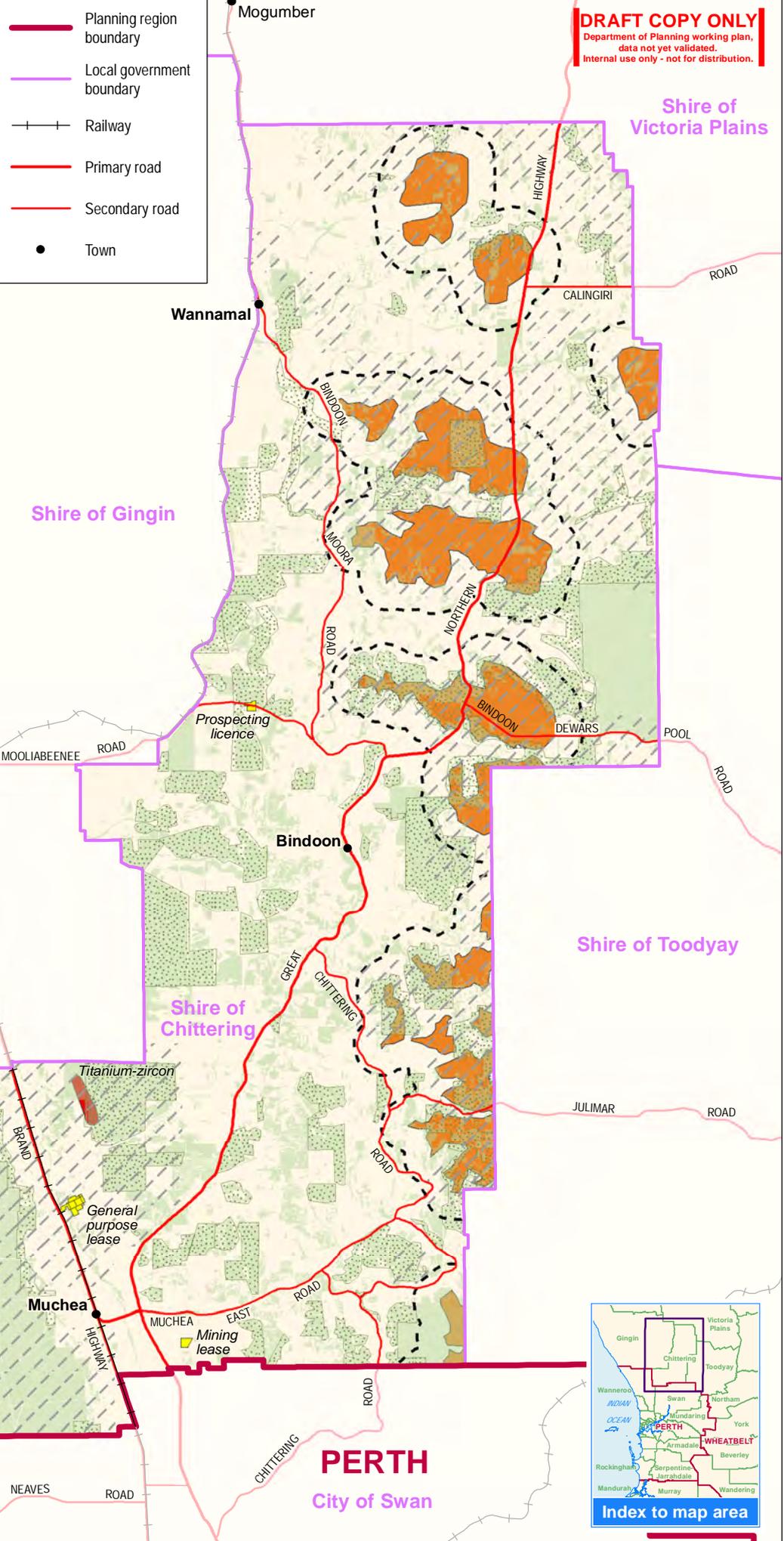
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Mineral resources and Mining tenements data
 supplied by Department of Mines and Petroleum

Native vegetation data supplied by
 Department of Agriculture and Food

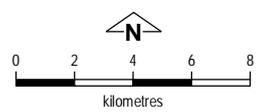
Legend

- Native vegetation
- High conservation value area
- Strategic mineral resources**
- Bauxite
- Titanium-zircon
- Strategic mineral resources separation distance
- Mining Tenements**
- Licence/lease area
- Exploration licence



Mineral resources and mining

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 Wheatbelt\ChitteringLocalPlanningStrategy\
 Fig11_BasicRawMaterials.mxd

Base information supplied by
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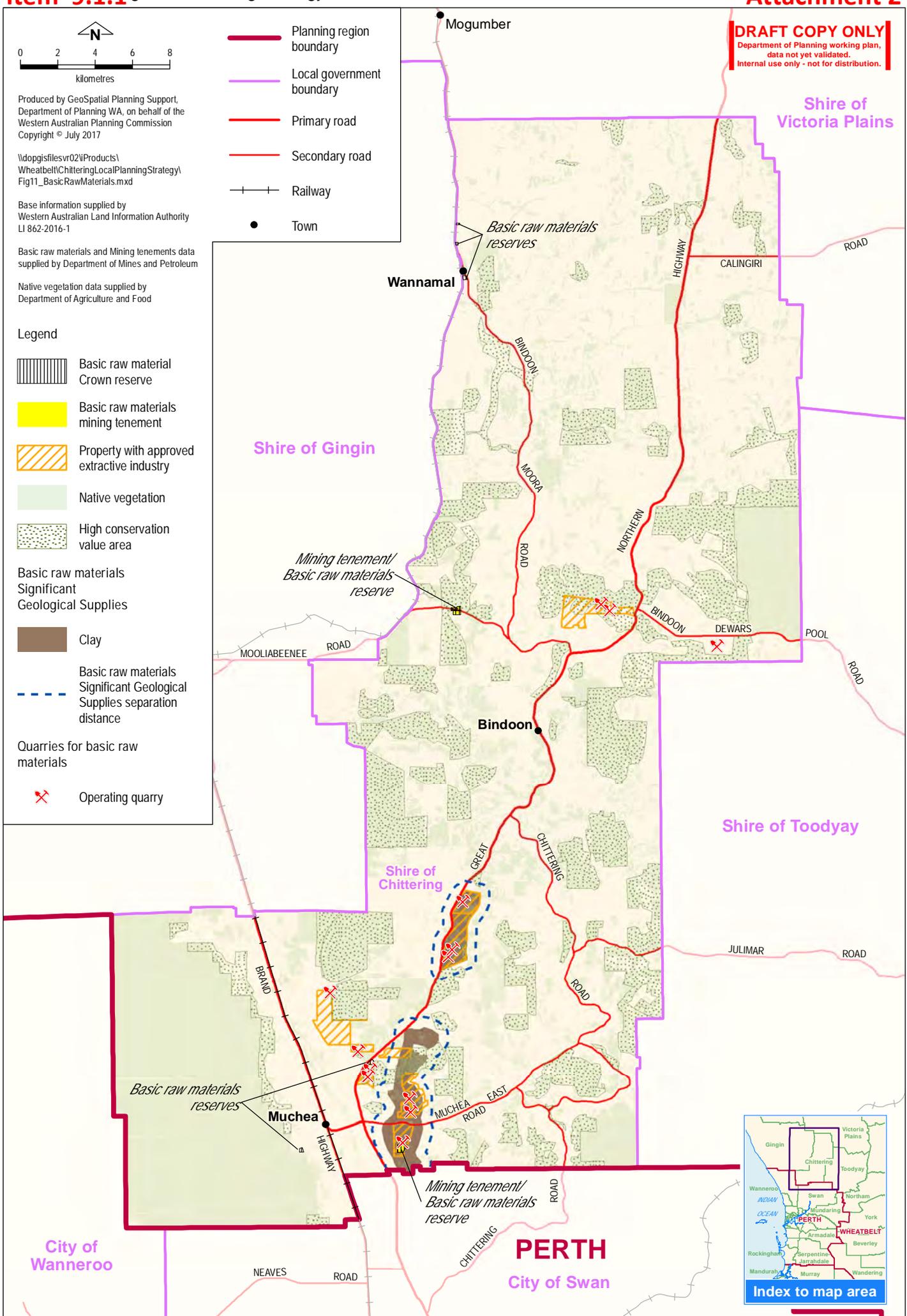
Basic raw materials and Mining tenements data
 supplied by Department of Mines and Petroleum

Native vegetation data supplied by
 Department of Agriculture and Food

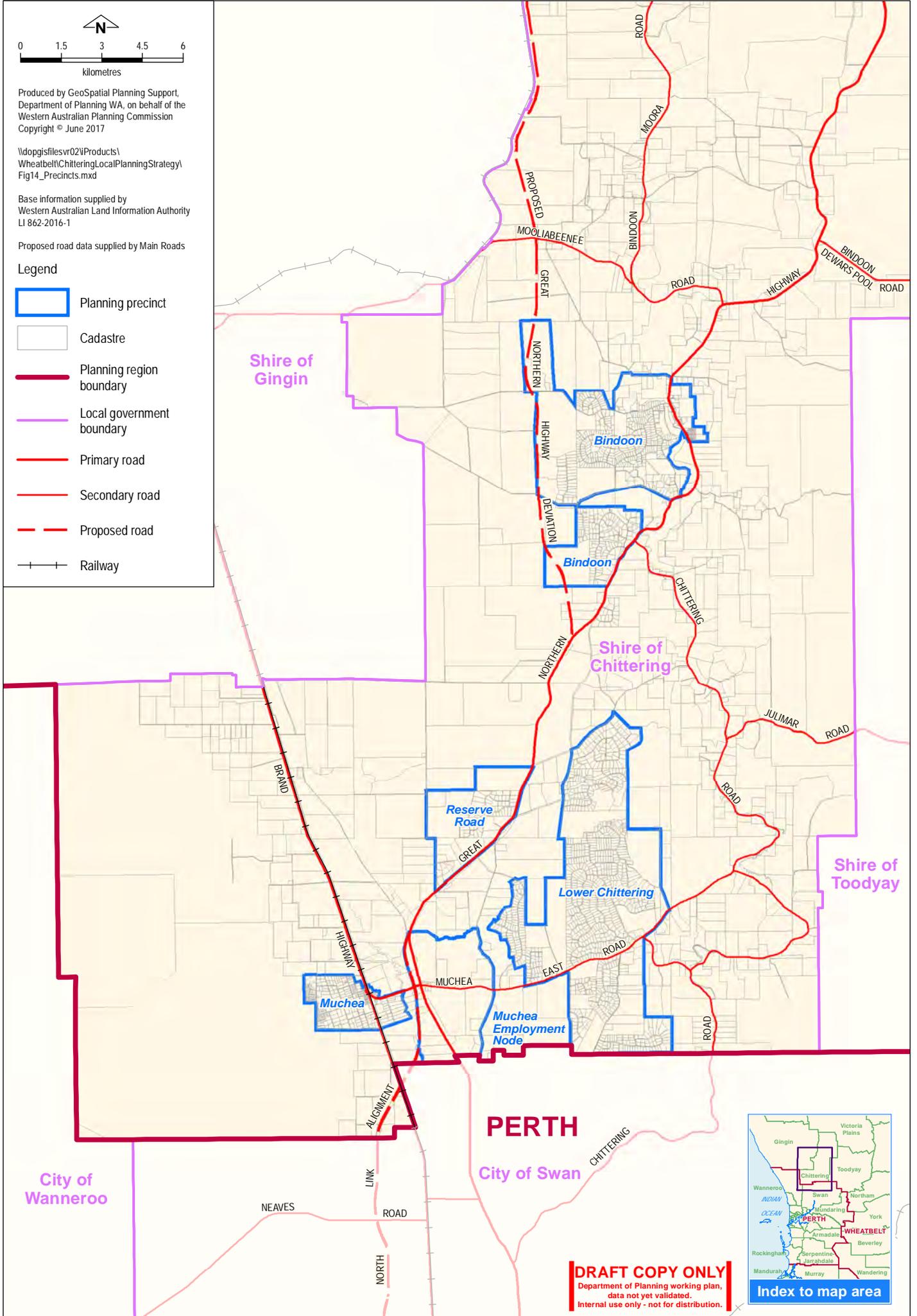
Legend

- Basic raw material Crown reserve
- Basic raw materials mining tenement
- Property with approved extractive industry
- Native vegetation
- High conservation value area
- Basic raw materials Significant Geological Supplies**
- Clay
- Basic raw materials Significant Geological Supplies separation distance
- Quarries for basic raw materials**
- Operating quarry

- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Railway
- Town



Basic raw materials

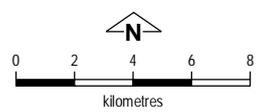


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Planning precincts

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 Fig3_CulturalHeritage.mxd

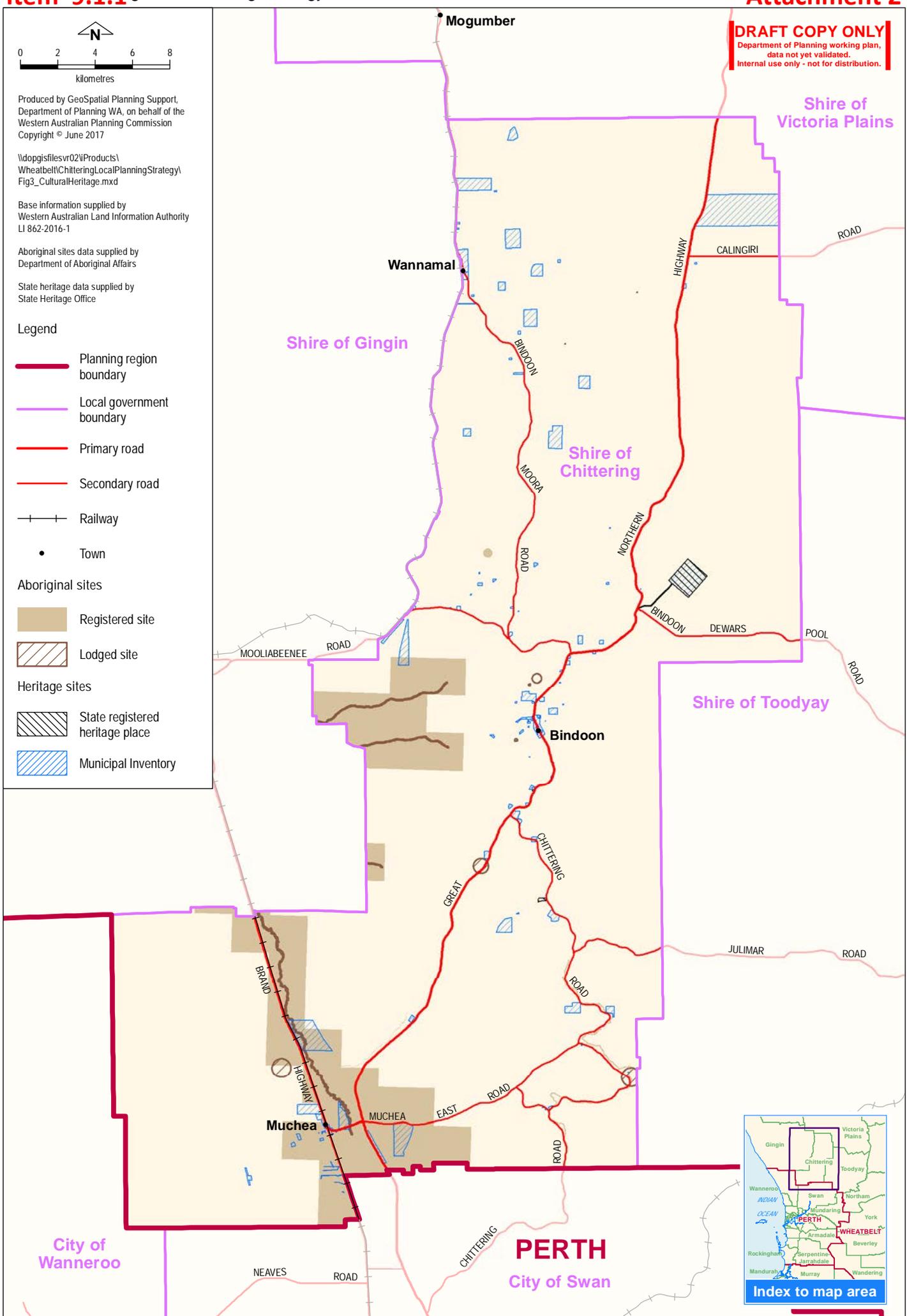
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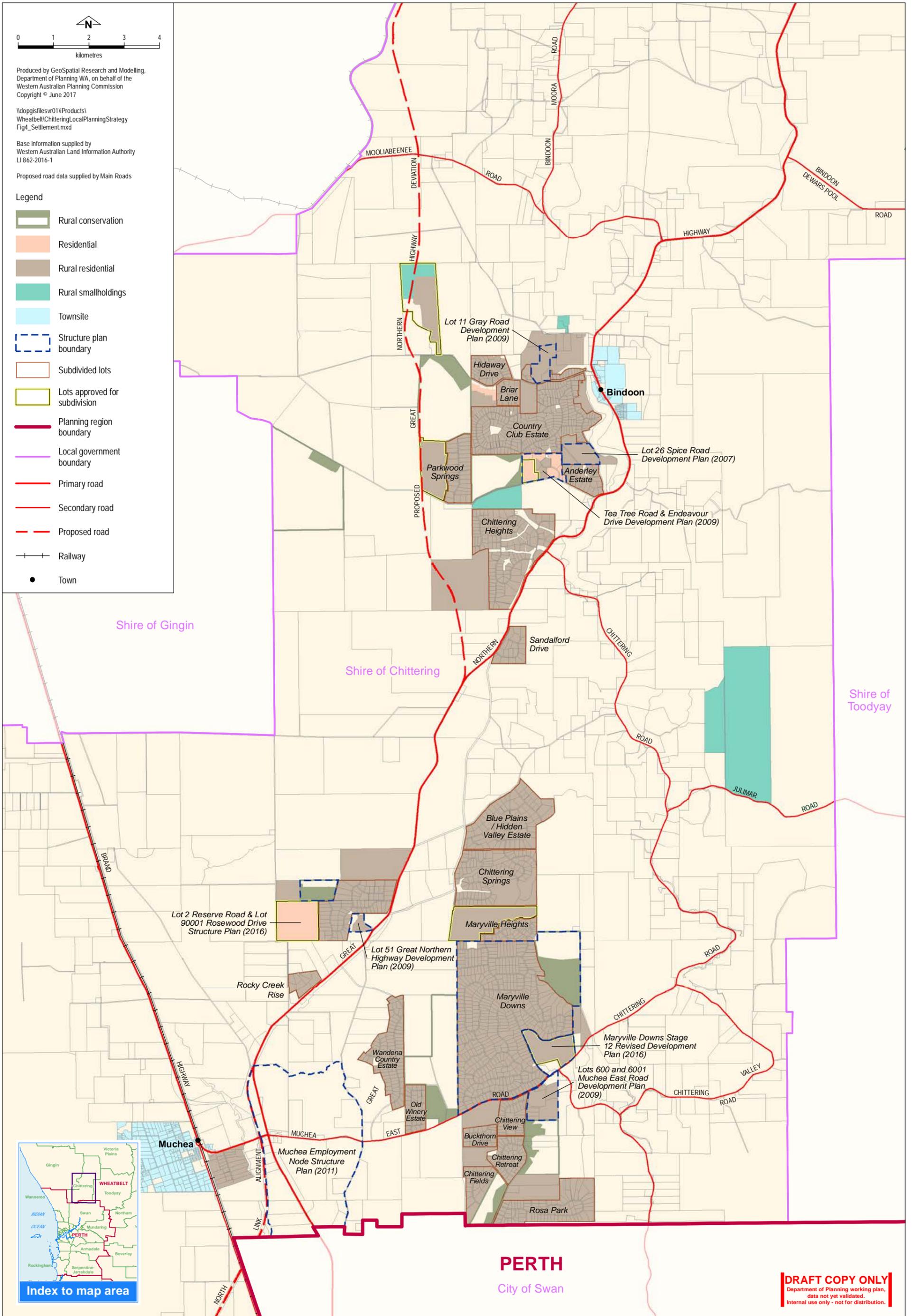
Aboriginal sites data supplied by
 Department of Aboriginal Affairs

State heritage data supplied by
 State Heritage Office

Legend

- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Railway
- Town
- Aboriginal sites**
- Registered site
- Lodged site
- Heritage sites**
- State registered heritage place
- Municipal Inventory

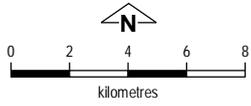




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Settlement

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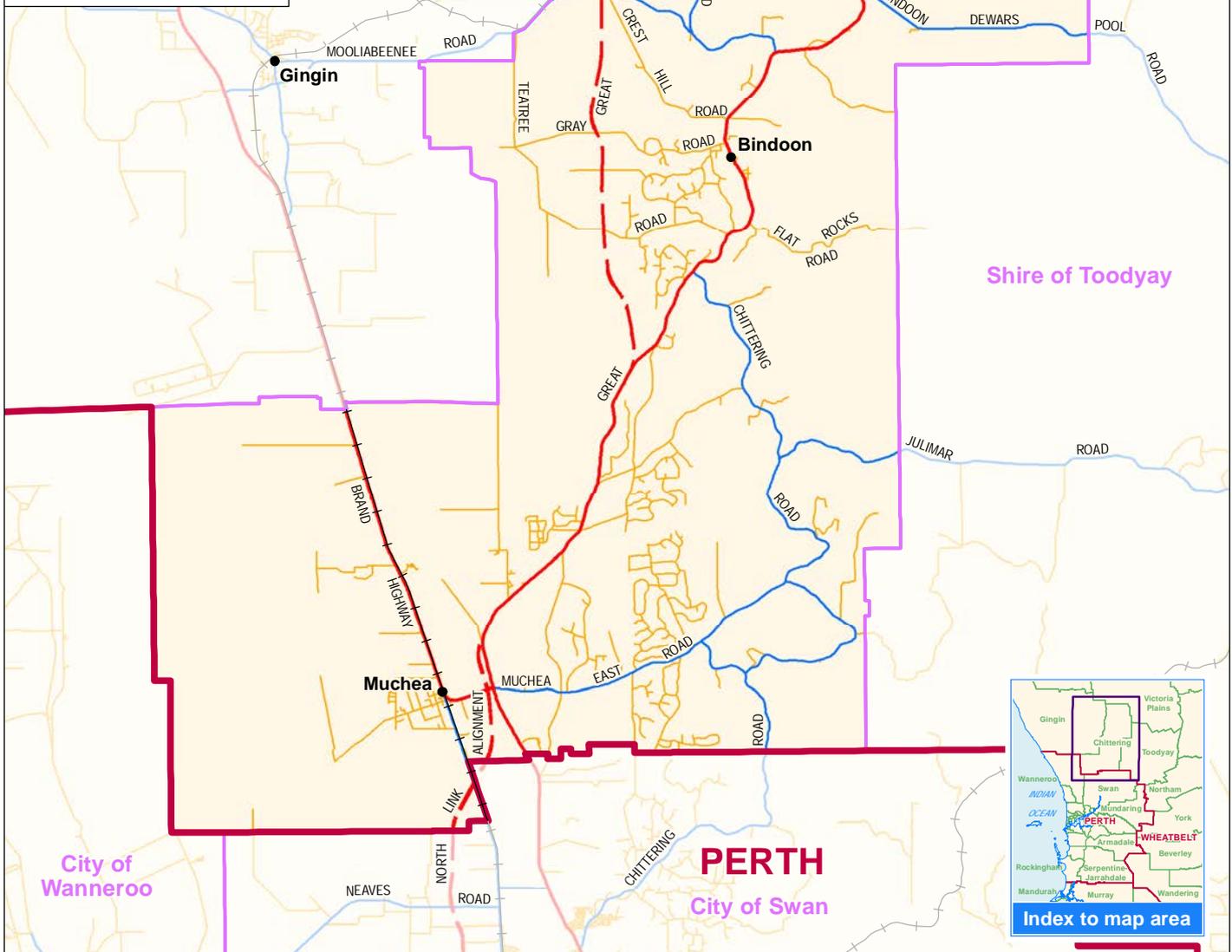
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Fig5_Transport.mxd

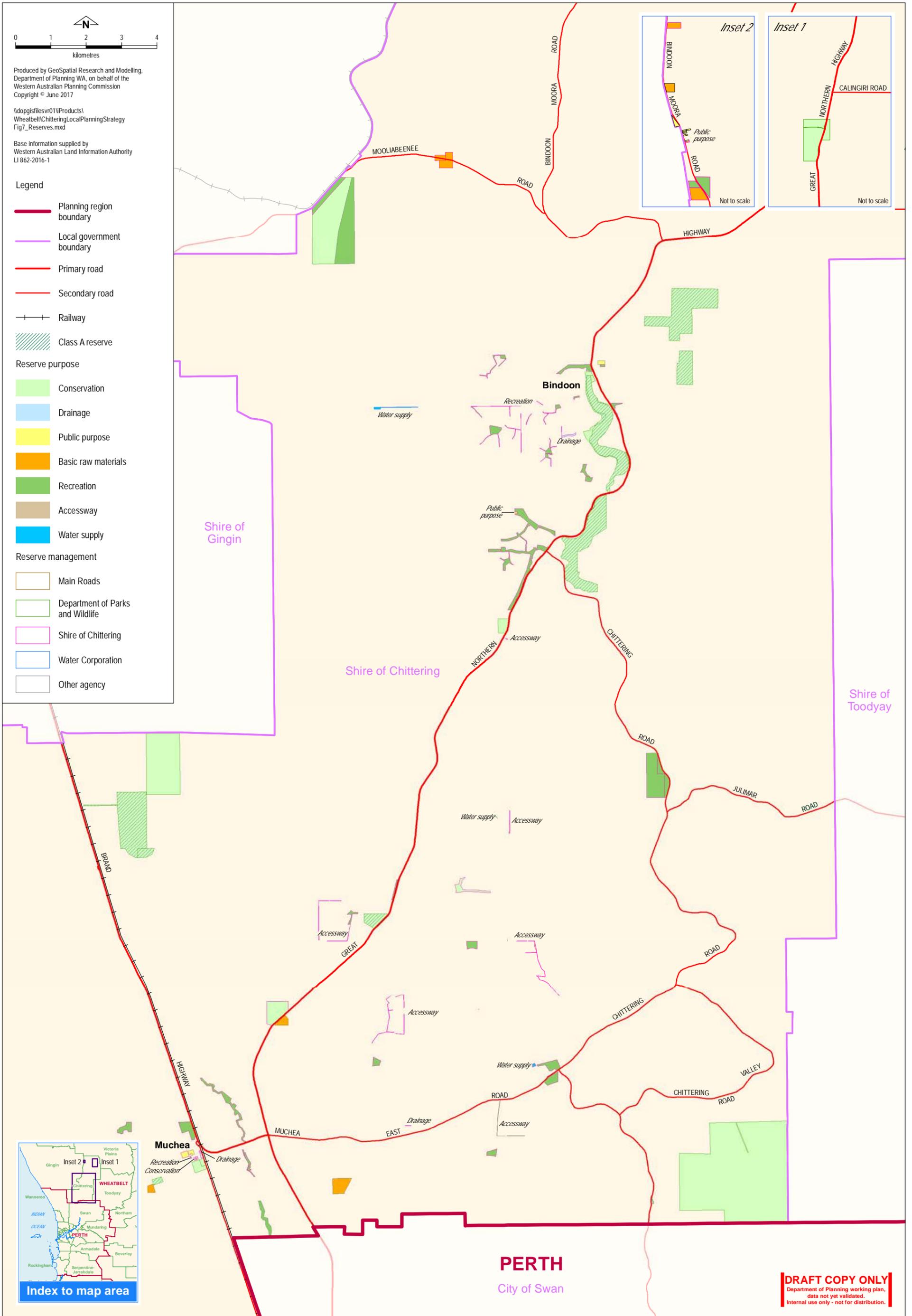
Base information supplied by
Western Australian Land Information Authority
LI 862-2016-1

North Link alignment data supplied by
Main Roads, Western Australia

Legend

- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Minor road
- Proposed road
- Railway
- Town

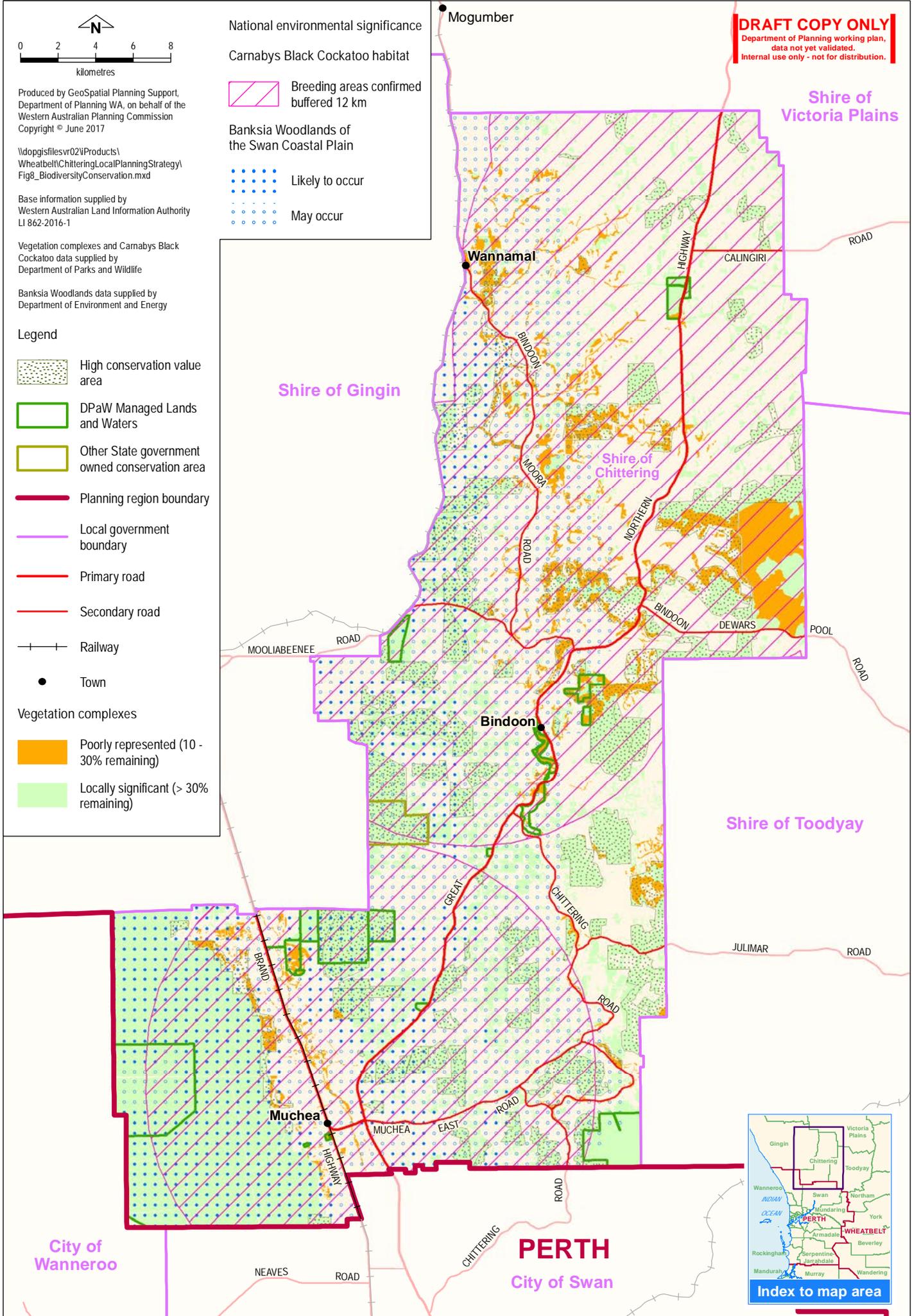


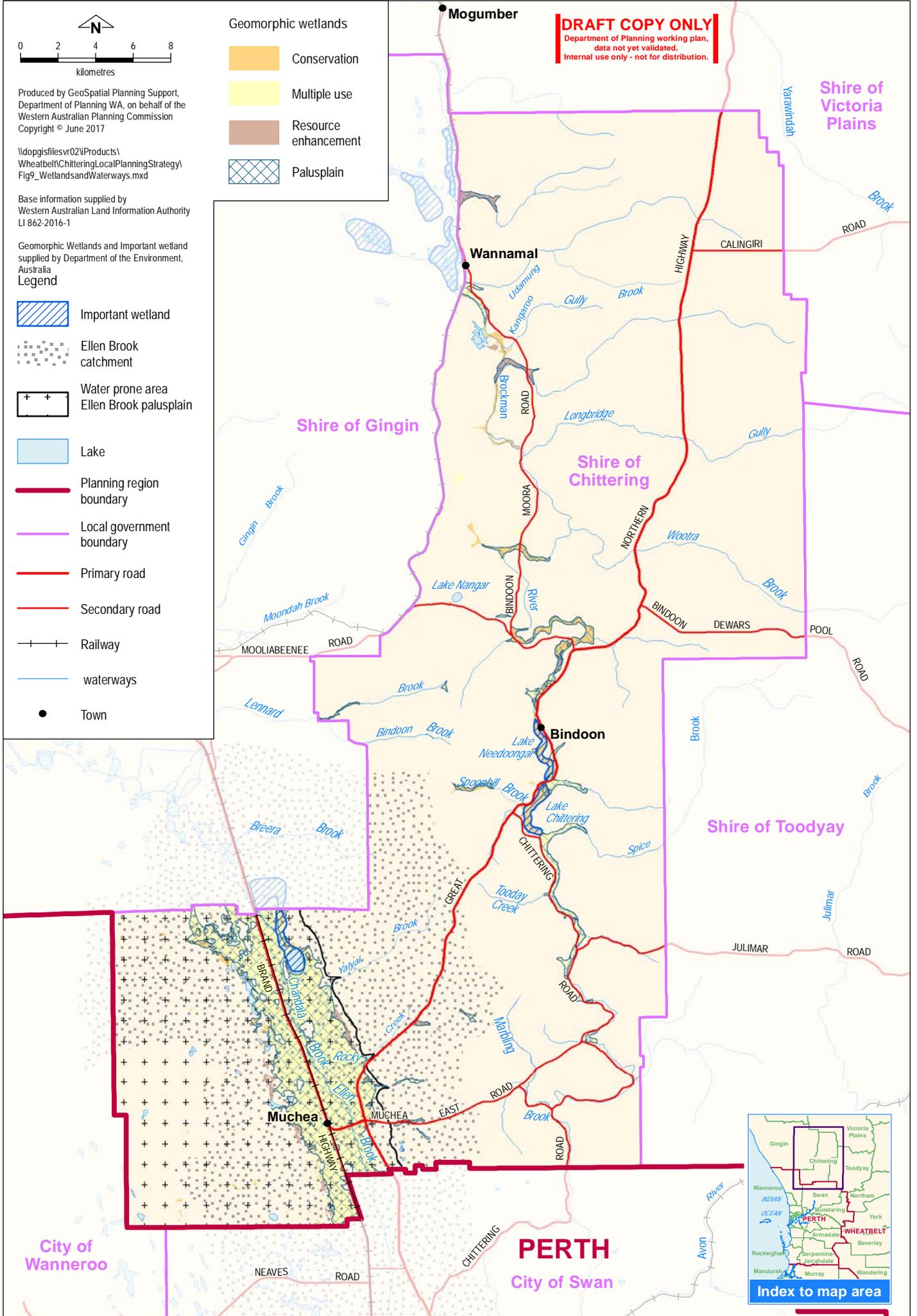


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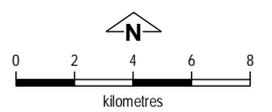
Reserves

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 Fig9_WetlandsandWaterways.mxd

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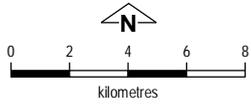
Geomorphic Wetlands and Important wetland
 supplied by Department of the Environment,
 Australia
 Legend

- Important wetland
- Ellen Brook catchment
- Water prone area
Ellen Brook palusplain
- Lake
- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Railway
- waterways
- Town



Wetlands and waterways

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 Fig11_BasicRawMaterials.mxd

Base information supplied by
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Basic raw materials and Mining tenements data
 supplied by Department of Mines and Petroleum

Native vegetation data supplied by
 Department of Agriculture and Food

Legend

- Basic raw material Crown reserve
- Basic raw materials mining tenement
- Property with approved extractive industry
- Native vegetation
- High conservation value area

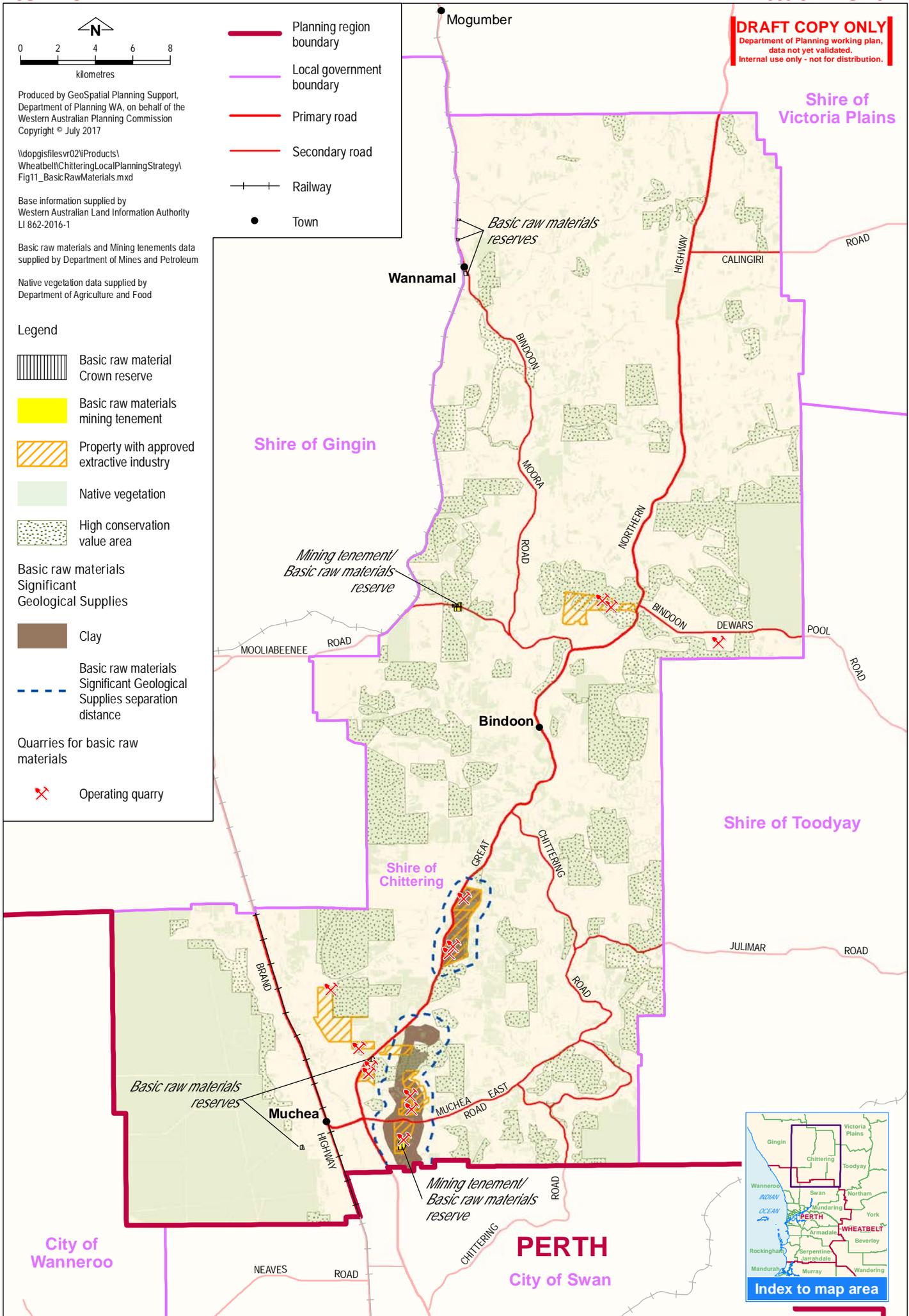
Basic raw materials Significant Geological Supplies

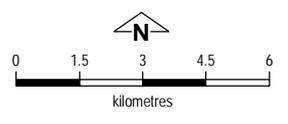
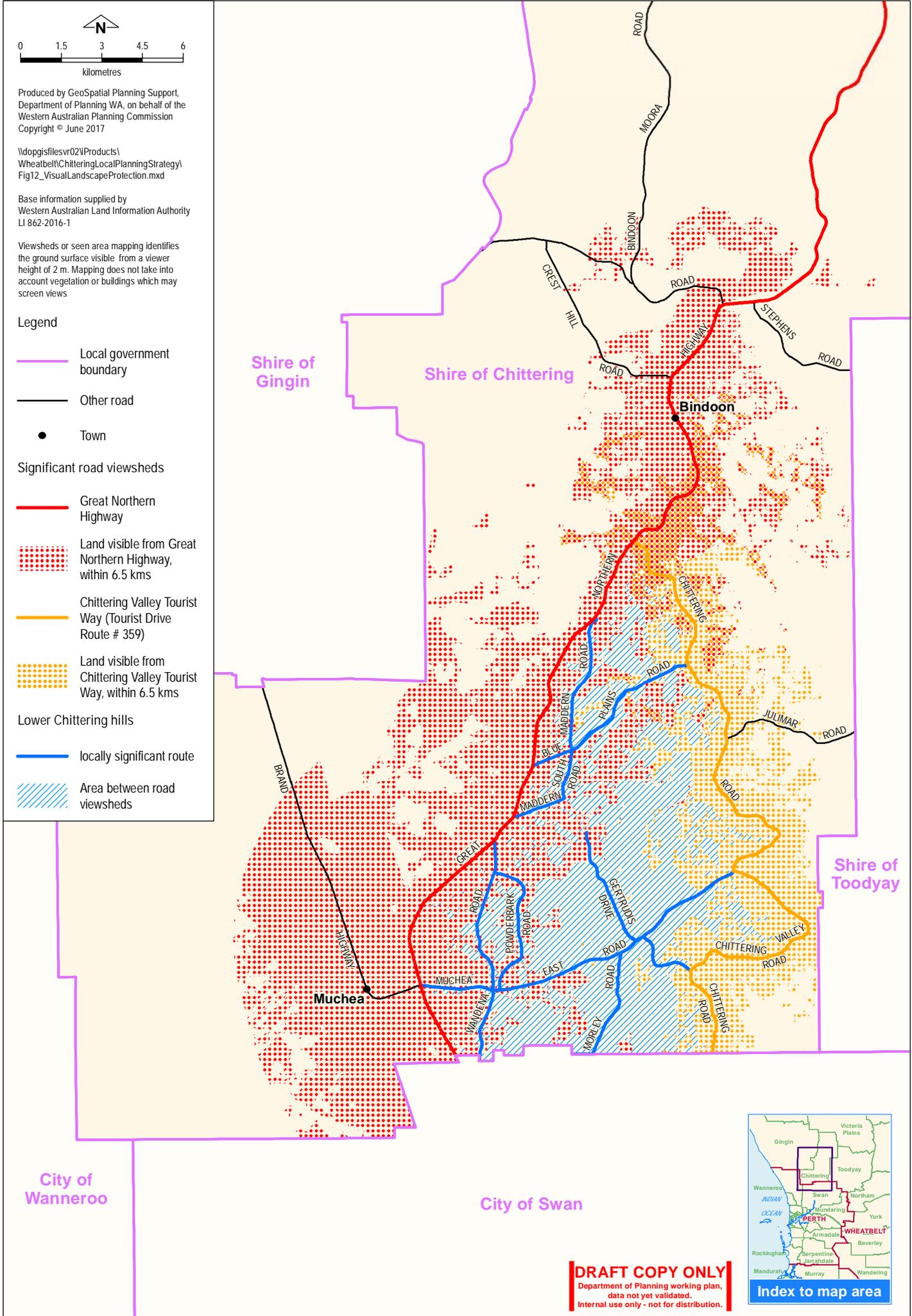
- Clay
- Basic raw materials Significant Geological Supplies separation distance

Quarries for basic raw materials

- Operating quarry

- Planning region boundary
- Local government boundary
- Primary road
- Secondary road
- Railway
- Town





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Wheatbelt\ChitteringLocalPlanningStrategy\
Fig12_VisualLandscapeProtection.mxd

Base information supplied by
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Viewsheds or seen area mapping identifies
the ground surface visible from a viewer
height of 2 m. Mapping does not take into
account vegetation or buildings which may
screen views

- Legend**
- Local government boundary
 - Other road
 - Town

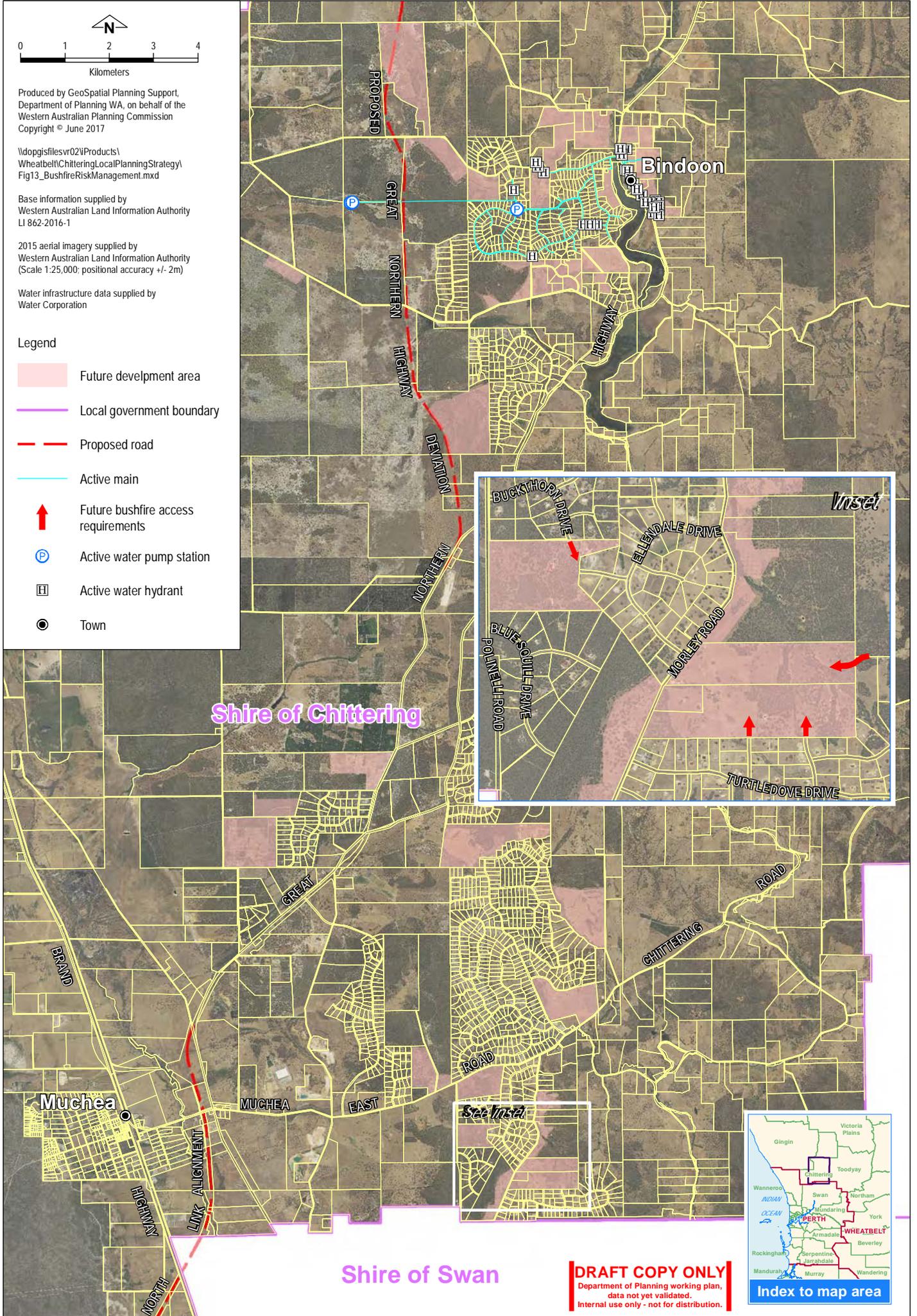
- Significant road viewsheds**
- Great Northern Highway
 - Land visible from Great Northern Highway, within 6.5 kms
 - Chittering Valley Tourist Way (Tourist Drive Route # 359)
 - Land visible from Chittering Valley Tourist Way, within 6.5 kms

- Lower Chittering hills**
- locally significant route
 - Area between road viewsheds



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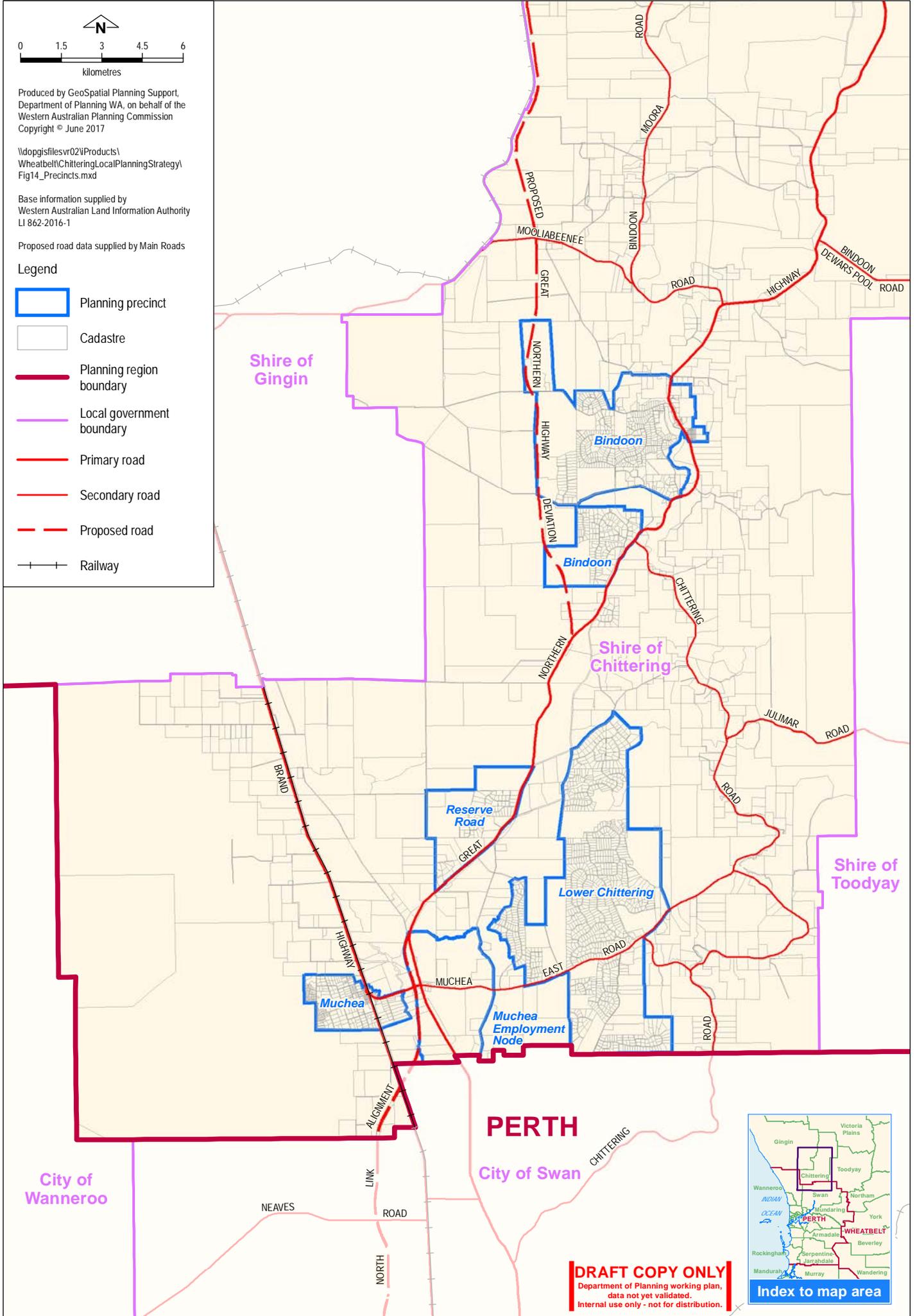
Index to map area



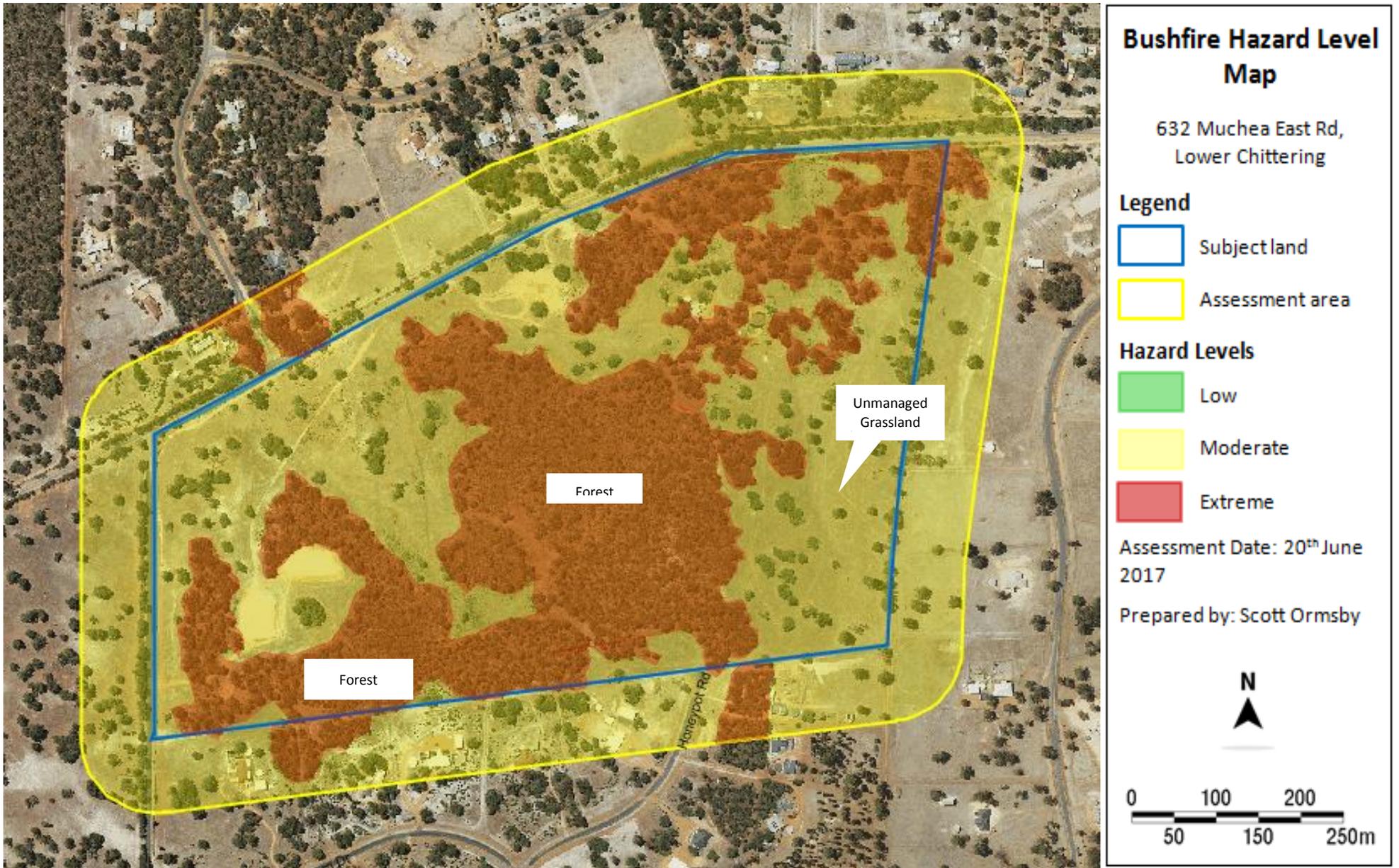
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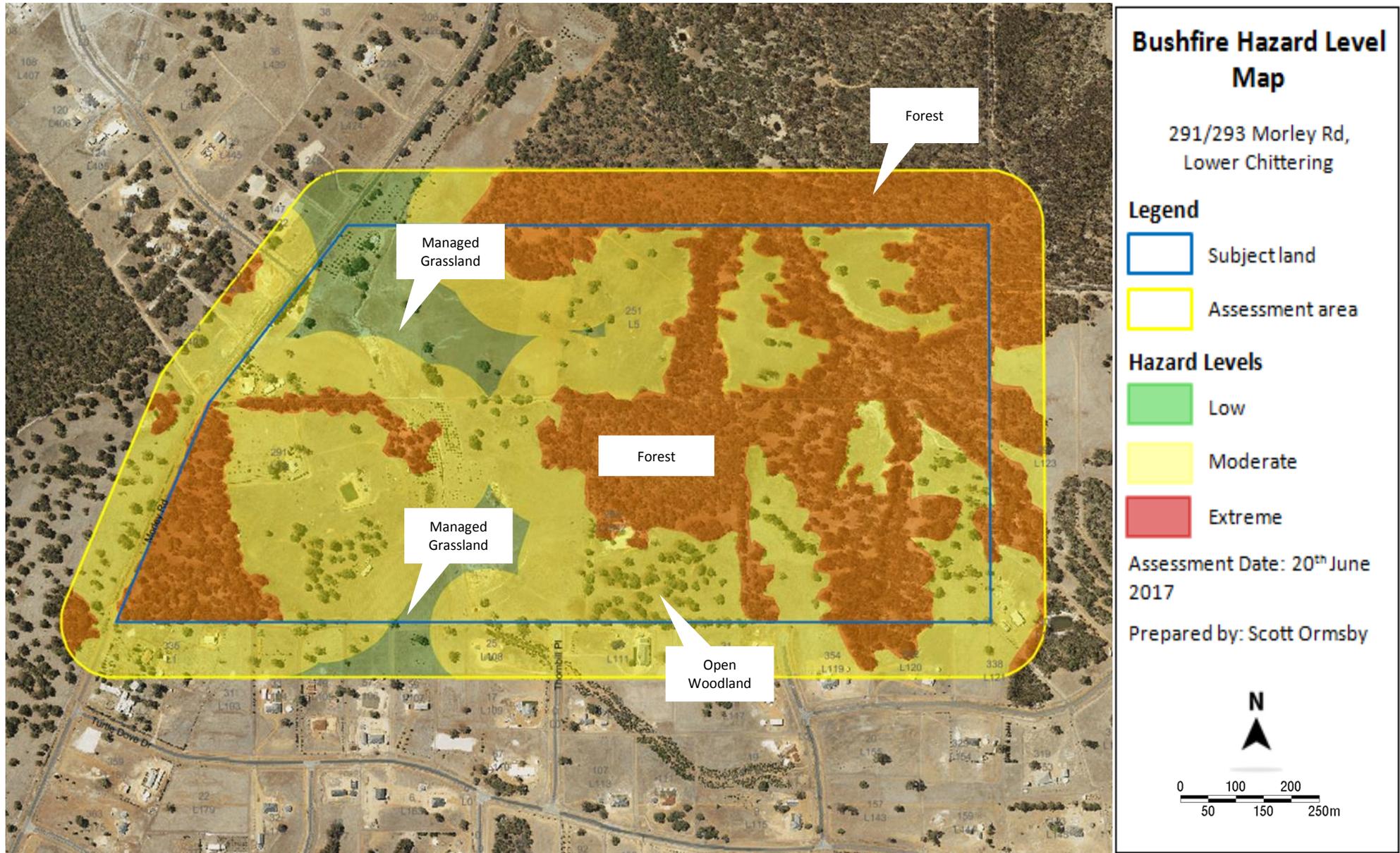


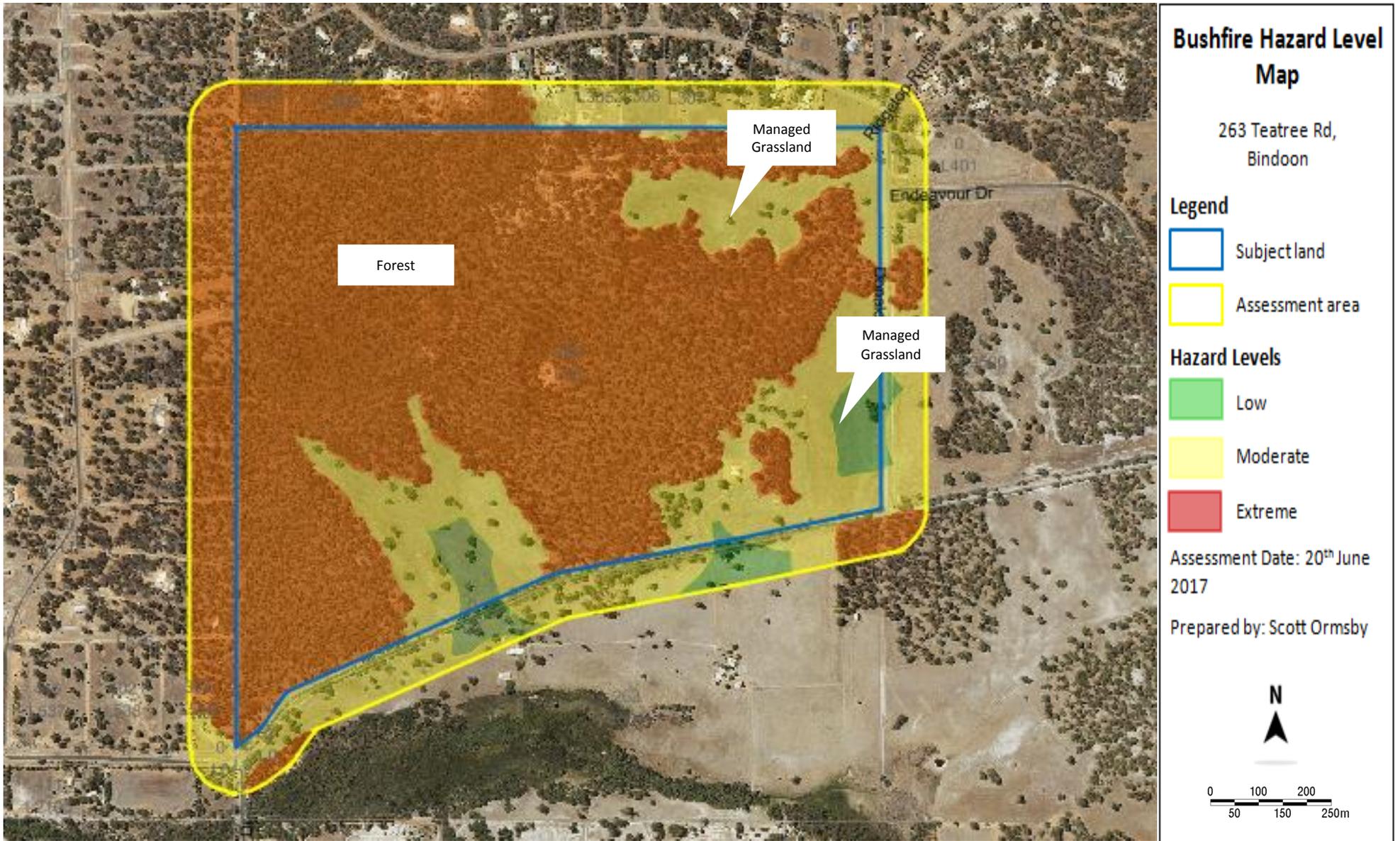
Bushfire risk management



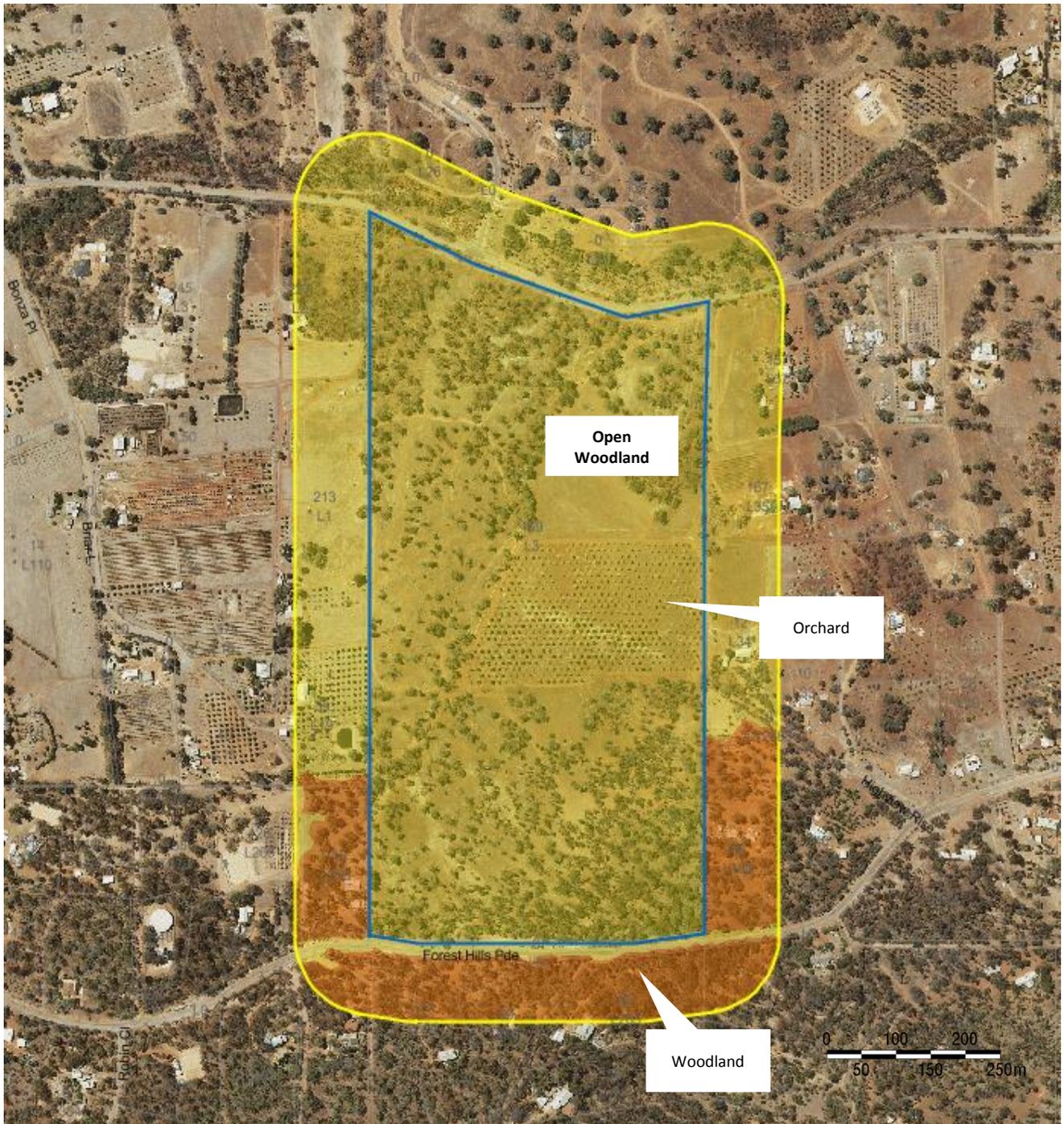
Planning precincts



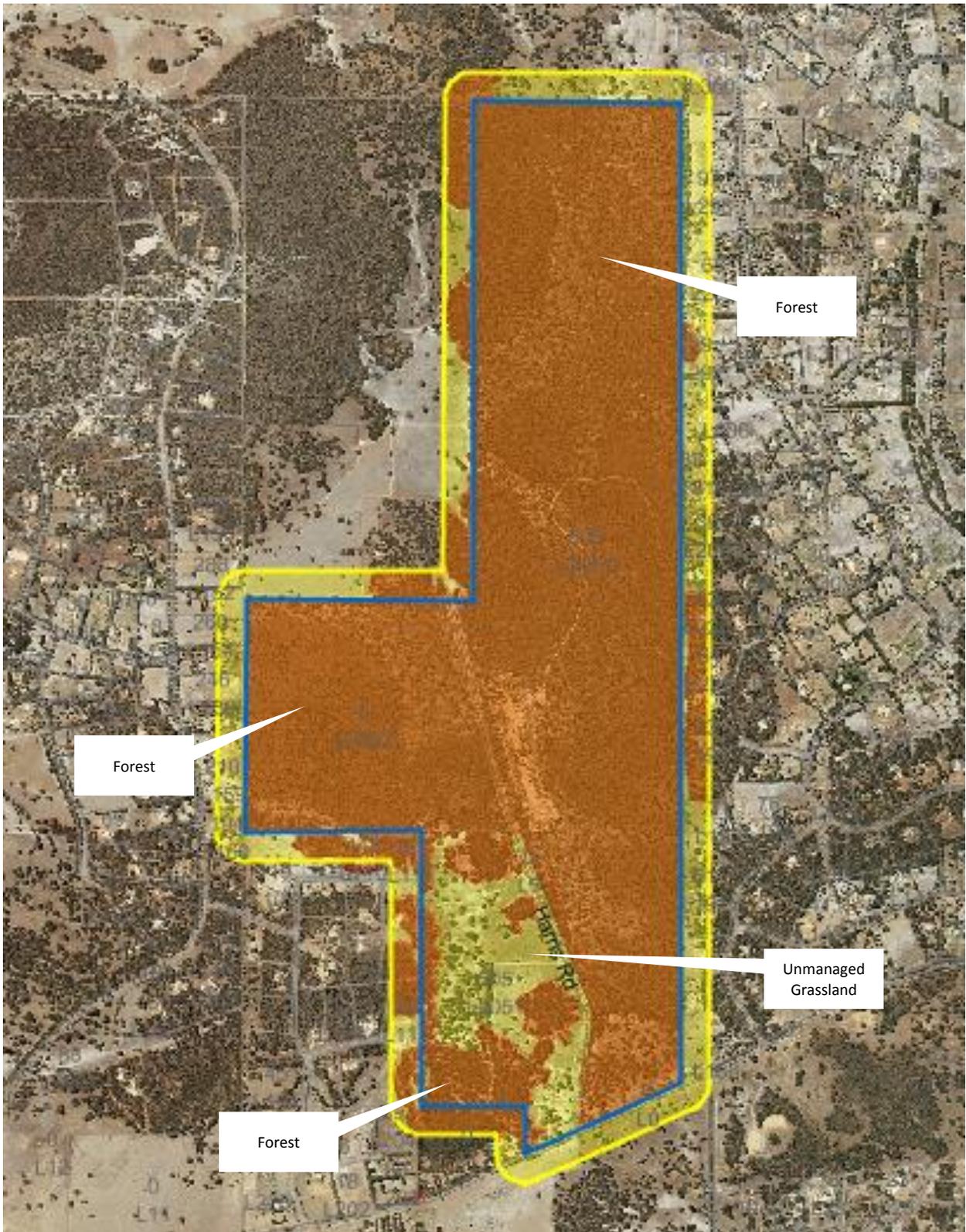


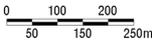




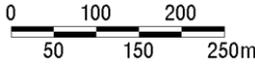


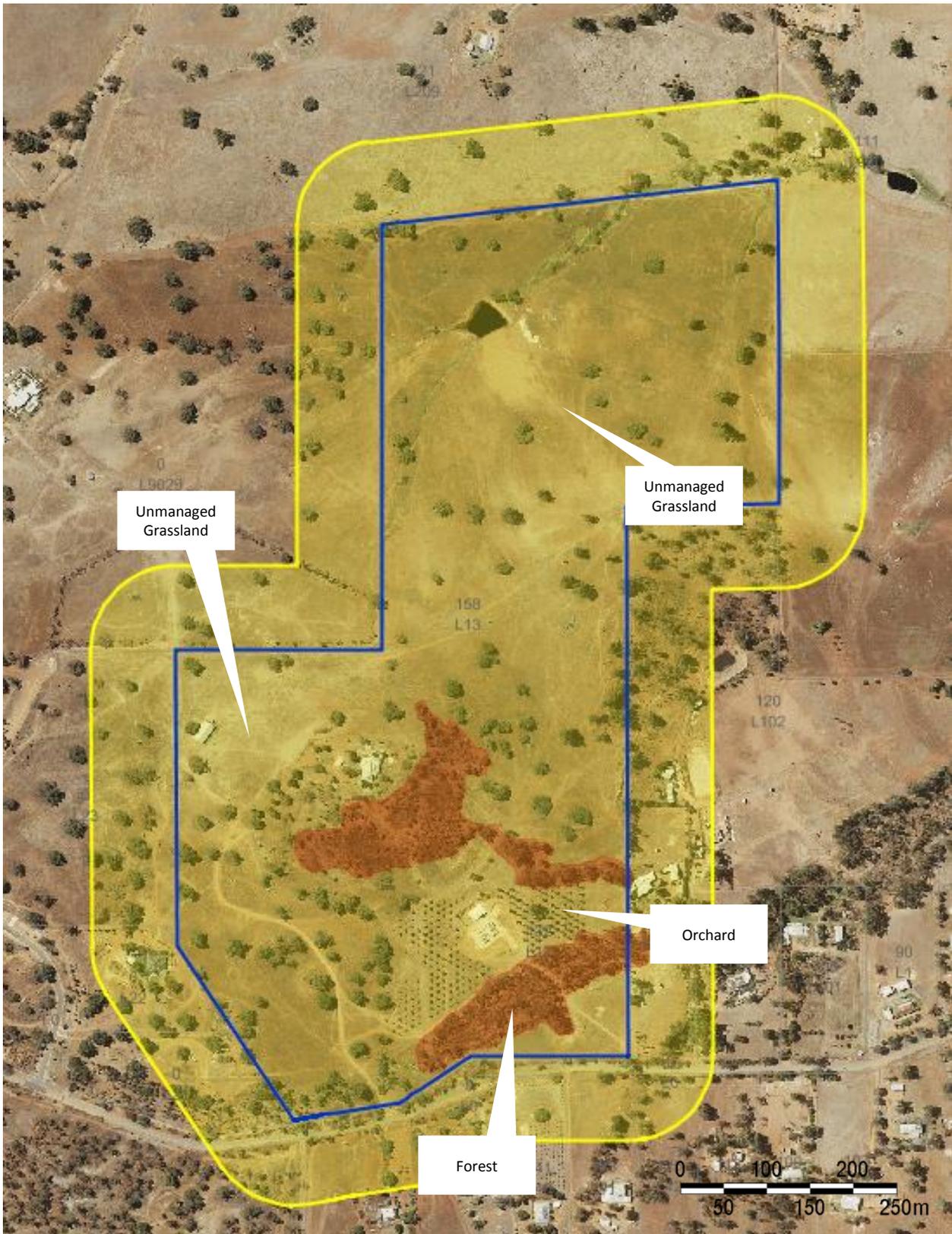
	Bushfire Hazard Level Map	Legend	
	169 Grey Rd, Bindoon	Subject land Assessment area	Low Moderate Extreme
	Assessment Date: 20 th June 2017 Prepared by: Scott Ormsby		



 	Bushfire Hazard Level Map		Legend	
	505 Muchea East Rd, Lower Chittering		 Subject land	 Low
	Assessment Date: 20 th June 2017 Prepared by: Scott Ormsby		 Assessment area	 Moderate



 	Bushfire Hazard Level Map		Legend	
	Lot 6 Morley Rd, Lower Chittering		 Subject land	 Low
	Assessment Date: 20 th June 2017 Prepared by: Scott Ormsby		 Assessment area	 Moderate



	Bushfire Hazard Level Map	Legend	
	158 Grey Rd, Bindoon	Subject land	Low
	Assessment Date: 20 th June 2017 Prepared by: Scott Ormsby	Assessment area	Moderate
		Extreme	

COMMUNICATION FRAMEWORK – SHIRE OF CHITTERING LOCAL PLANNING STRATEGY 2017-2027

1. Introduction

This Communication Framework has been developed setting out statutory obligations and recommended consultation and communications processes for the Shire of Chittering draft Local Planning Strategy (LPS).

The Communication Framework has been guided by considerations including:

- the Shire of Chittering Community engagement Plan and Communication Plan;
- recent community/stakeholder consultation that has occurred on the Strategic Community Plan;
- the Shire seeks endorsement of the draft LPS in an efficient time period;
- to ensure accountability and transparency of Council decisions; and
- an appreciation of available staff and financial resources.

Given the above, the communication framework sets out realistic approaches that exceed statutory obligations but which should assist to inform, gather information and involve the community and stakeholders on the LPS.

2. Statutory Obligations for Consulting

2.1 Overview

The *Planning and Development (Local Planning Schemes) Regulations 2015* ("the Regulations") prescribe the procedures to be followed in the preparation of a Local Planning Strategy. Relevant sections are set out in Attachment 1. Sections 13 and 14 of the Regulations set out consultation requirements for a Local Planning Strategy which are outlined in Attachment 2.

2.2 LPS

On receipt of the Western Australian Planning Commission's (WAPC) consent, and on completion of any required modifications, the Shire is to advertise the LPS for at least 21 days, in the manner as stated in the regulations, and any additional form of consultation required by the WAPC.

The requirements of Regulation 13 are that formal notice of the availability of the LPS for public comment is to be advertised as soon as reasonably practicable and once in a newspaper circulating in the area. The notice is to include reference to the places where the LPS documentation can be inspected and the date by which submissions should be made. The notice is also required to state the person and the address to which submissions should be directed.

At the end of the process, the Shire is to review each and every submission and respond with any changes made to address issues raised in the submissions.

3. Recommended Consultation and Communication Processes

The minimum statutory requirements on consulting on a local planning scheme are standard local government practice. Given the implications arising from the feedback received for the Strategic Community Plan, it is recommended that the Shire exceeds the minimum statutory requirements.

Unless directed to by Council or by the Minister, an eight (8) week advertising period, with an additional two (2) weeks' grace period for late submissions is recommended for the draft LPS.

It is suggested that the following approaches be used in consulting on the draft LPS (which will far exceed statutory obligations):

- notice in "The West Australian";
- notices in the local newspaper on multiple occasions;
- Shire of Chittering's eChatter and other local newsletters;
- writing to and inviting comments from wide-ranging government agencies and stakeholders (a preliminary list is set out in Attachment 3);
- placing details on the Shire's website for the duration of the public comment period and beyond;
- having information available at the Shire administration Centre, the Shire's Library (including using display boards) and at the Department of Planning office in Perth;
- hold a booth at the Taste of Chittering festival;
- an information day/evening and/or public meeting held in the Shire;
- media releases/statements; and
- target focus groups.

It is recommended that the Shire also:

- Utilise the mailing list of community groups, business groups, natural resource management/environmental groups, planning consultants, surveyors, real estate agents, developers and others who express an interest in the process;
- write to any landowner who may be affected or impacted;
- consider how it will address people with special needs including non-English speaking, Braille etc; and
- ensure there is appropriate feedback. A cost effective and efficient approach is through the use of 'have your say' on the Shire's Website (this should be updated as appropriate). A preliminary list of questions is set out in Attachment 4 which could also be used in other communication forms.

4. Consultation & Communication Processes to be Further Considered

Subject to resource and associated considerations, the Shire may wish to consider the following additional options:

- formal launch;
- individual notices to all ratepayers via a mail out;
- letter box drop;

- brochures/fact sheets (e.g. executive summary, use of questions & answers);
- community survey;
- briefing politicians; and
- information available at festivals/community events/shows.

5. Consultation and Communication Processes Not Recommended

It is recommended that the following approaches are not appropriate for reasons set out in section 1 including:

- an informal submission period (in advance of/in addition to the formal submission period);
- mail outs to each and every landowner in the Shire;
- visioning workshops or charrettes;
- a LPS website;
- on-line forum;
- information line;
- using radio and television; and
- school competitions and school information kit.

6. Key Messages and Managing Expectations

In an endeavour to effectively get messages across to the community and stakeholders and to assist in a more efficient process, it is recommended that the Shire should:

- seek to effectively manage the expectations of landowners and stakeholders regarding subdivision/development potential;
- manage timing expectations (given considerable matters are outside the direct control of the project team and/or the Shire);
- clearly set out what is negotiable and can be influenced based on community opinion, and also what is not for negotiation (i.e. in established planning policy);
- communicate the limitations and potential of the planning process to deliver a desired future community; and
- inform the community on how community values and issues have been responded to.

7. Timing

Consideration should be given as to the timing for adoption of draft LPS and the associated timing of consultation. While preference is to have the draft LPS gazetted as soon as possible, such timing should not be at the behest of extensive consultation.

8. Conclusion

The recommended approach to consultation and communication meets (and exceeds) statutory obligations, provides appropriate opportunities for the community and stakeholders to provide input and it recognises Shire of Chittering resources.

Attachment 1 - Extract from *Planning and Development Act 2005***11. Requirement for local planning strategy for local planning scheme**

- (1) *A local government must prepare a local planning strategy in accordance with this Part for each local planning scheme that is approved for land within the district of the local government.*
- (2) *A local planning strategy must —*
 - (a) *set out the long-term planning directions for the local government; and*
 - (b) *apply any State or regional planning policy that is relevant to the strategy; and*
 - (c) *provide the rationale for any zoning or classification of land under the local planning scheme.*
- (3) *A local planning strategy may be prepared concurrently with the local planning scheme to which it relates.*

12. Certification of draft local planning strategy

- (1) *Before advertising a draft local planning strategy under regulation 13 the local government must provide a copy of the strategy to the Commission.*
- (2) *On receipt of a copy of a draft local planning strategy the Commission must, as soon as reasonably practicable, assess the strategy for compliance with regulation 11(2).*
- (3) *If the Commission is not satisfied that a draft local planning strategy complies with regulation 11(2) the Commission may, by notice in writing, require the local government to —*
 - (a) *modify the draft strategy; and*
 - (b) *provide a copy of the draft strategy as modified to the Commission for assessment under subregulation (2).*
- (4) *If the Commission is satisfied that a draft local planning strategy complies with regulation 11(2) it must certify the strategy accordingly and provide a copy of the certification to the local government for the purpose of proceeding to advertise the strategy.*

Attachment 2 - Extract from *Planning and Development (Local Planning Schemes) Regulations 2015*

The Regulations set out the following for advertising a draft local planning strategy:

13. Advertising and notifying local planning strategy

- (1) *A local government must, as soon as reasonably practicable after being provided with certification that a local planning strategy complies with regulation 11(2), advertise the strategy as follows —*
 - (a) *publish a notice of the local planning strategy in a newspaper circulating in the area to which the strategy relates, giving details of —*
 - (i) *where the strategy may be inspected; and*
 - (ii) *to whom, in what form and during what period submissions may be made;*
 - (b) *display a copy of the notice in the offices of the local government for the period for making submissions set out in the notice;*
 - (c) *give a copy of the notice to each public authority that the local government considers is likely to be affected by the strategy;*
 - (d) *publish a copy of the notice and the strategy on the website of the local government;*
 - (e) *advertise the strategy as directed by the Commission and in any other way the local government considers appropriate.*
- (2) *The local government must ensure that arrangements are in place for the local planning strategy to be made available for inspection by the public during office hours —*
 - (a) *at the office of the local government; and*
 - (b) *at the office of the Commission.*
- (3) *The period for making submissions in relation to a local planning strategy must not be less than a period of 21 days commencing on the day on which the notice of the strategy is published under subregulation (1)(a).*
- (4) *Notice of a local planning strategy as required under subregulation (1) may be given in conjunction with the notice to be given under regulation 20(1) for the scheme to which it relates.*

14. Consideration of submissions

- (1) *After the expiry of the period within which submissions may be made in relation to a local planning strategy, the local government must review the strategy having regard to any submissions made.*
- (2) *The local government may —*
 - (a) *support the local planning strategy without modification; or*
 - (b) *support the local planning strategy with proposed modifications to address issues raised in the submissions.*
- (3) *After the completion of the review of the local planning strategy the local government must submit to the Commission —*
 - (a) *a copy of the advertised local planning strategy; and*
 - (b) *a schedule of the submissions received; and*
 - (c) *particulars of any modifications to the advertised local planning strategy proposed by the local government.*

Attachment 3 - Preliminary list of stakeholders to consult (incorporate in mailing list)

Department of Mines and Petroleum

Department of Agriculture and Food WA

Department of Environment Regulation

Department of Parks and Wildlife

Department of Water

Department of Fire and Emergency Services

Department of Health

Heritage Council of WA and National Trust

Department of Lands

Department of Housing

Department of Aboriginal Affairs

Department of Education

Department of Local Government and Communities

Department of Sport & Recreation

Tourism WA

Experience Perth

Department of Commerce

Public Transport Authority of WA

Telstra

Water Corporation

Horizon Power

Alinta Energy

Politicians representing the area

St Johns Ambulance

Police, Schools and the Hospital

Aboriginal groups/Elders

Community groups and Sporting clubs

Local heritage groups

Environmental and natural resource management groups

Chamber of Commerce (regional and local)

Chittering Tourist Association

Adjoining local government authorities

Attachment 4 - Preliminary list of questions/information for website, brochure etc.

- What is a local planning strategy
- Describe the process.
- How long is the process
- Where have we been
- Where are we going
- How can you get involved

These points may be items that can be answered in a fact sheet.

When updating the website, present clear messages such as:

- What is the aim of the process
- What commitments have been made
- How is the community involved
- How can you have your say

Provide information links to relevant websites that contain additional information.

PSA Ref: 4864

14 February 2017

Chief Executive Officer
 Shire of Chittering
 PO Box 70
 BINDOON WA 6502

Attention: Bronwyn Southee, Executive Manager Development Services

Dear Ms Southee,

LOTS 802 & 803 (3571) GREAT NORTHERN HIGHWAY, MUCHEA
 APPLICATION FOR DEVELOPMENT APPROVAL
 PROPOSED CHANGE OF USE FOR THE OPEN-AIR STORAGE OF MINING
 EQUIPMENT/VEHICLES AND SKIP BINS

Planning Solutions acts on behalf of Karratha Enterprises Pty Ltd, the registered proprietor of Lots 802 and 803 (3571) Great Northern Highway, Muchea (subject site). Planning Solutions has prepared the following report in support of an Application for Development Approval for the open-air storage of mining equipment/vehicles and skip bins on the subject site.

With regard to the above, please find enclosed:

1. Shire of Chittering's Development Application Form and Checklist, signed by the current landowner, Karratha Enterprises Pty Ltd.
2. A completed credit card authorisation form for \$885 in payment of the change of use application fee (retrospective).
3. Two (2) copies of the development plan.
4. A comprehensive development application report which discusses various issues pertinent to the proposal; including site details, proposed development and town planning considerations.

We respectfully request that the Shire of Chittering grants development approval for the additional open-air storage activities on site.

Should you have any queries or require further clarification in regard to the above matter please do not hesitate to contact the undersigned.

Yours faithfully

pp. 

SCOTT VINCENT
 SENIOR PLANNER

170214 4864 DA covering letter

Application for Development Approval

Lots 802 & 803 (3871) Great Northern Highway,
Mucea



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No express or implied warranties are made by Planning Solutions (Aust) Pty Ltd regarding the information and analysis contained in this report. In particular, but without limiting the preceding exclusion, Planning Solutions (Aust) Pty Ltd will not verify, and will not assume responsibility for, the accuracy and completeness of information provided to us.

This report has been prepared with particular attention to our Client's instructions and the relevant features of the subject site. Planning Solutions (Aust) Pty Ltd accepts no liability whatsoever for:

1. a third party's use of, or reliance upon, this report;
2. use of, or reliance upon, this report in relation to any land other than the subject site; or
3. the Client's implementation, or application, of the strategies recommended in this report.

Direct all inquiries to:

Planning Solutions
296 Fitzgerald Street
Perth WA 6000

All correspondence to:
PO Box 8701
Perth Business Centre WA 6849

Phone: 08 9227 7970
Fax: 08 9227 7971
Email: admin@planningsolutions.com.au
Web: www.planningsolutions.com.au

Project details

Job number	4864	
Client	Karratha Enterprises Pty Ltd	
Prepared by	Planning Solutions	
Consultant Team	Town Planning Environmental & Water Management	Planning Solutions Strategen Environmental

Document control

Revision number	File name	Document date
Rev 0	1701304864 Development application report - Muchea	7 February 2017

Contents

1	Preliminary.....	1
1.1	Introduction	1
1.2	Background	1
2	Site details	3
2.1	Land description.....	3
2.2	Location.....	3
2.2.1	Regional context	3
2.2.2	Local context, land use.....	3
3	Proposed development.....	6
3.1	Subject activities	6
3.2	Supporting analysis	6
4	Statutory planning framework	7
4.1	Planning and Development Act 2005	7
4.2	Planning and Development (Local Planning Schemes) Regulations 2015	7
4.3	State planning policies	7
4.3.1	SPP 2.0 Environment and Natural Resources Policy	7
4.3.2	SPP 3.7 Planning in Bushfire Prone Areas	8
4.3.3	Draft SPP 4.1 State Industrial Buffer Policy (Amended)	9
4.4	Shire of Chittering Town Planning Scheme No. 6	10
4.4.1	Zoning and additional use classification	10
4.4.2	Land use classification	10
4.5	Muchea Employment Node Structure Plan	11
5	Environmental considerations	12
5.1	Environmental report.....	12
5.2	Local water management.....	12
5.3	Bushfire management	13
6	Conclusion.....	14

Figures

- Figure 1: Aerial Photograph
 Figure 2: Zoning Map

Appendices

- Appendix 1: Department of Planning letter dated 2 December 2016
 Appendix 2: Certificates of Title and Deposited Plan
 Appendix 3: Water Management Strategy and Environmental Assessment

1 Preliminary

1.1 Introduction

Planning Solutions acts on behalf of Karratha Enterprises Pty Ltd, the registered proprietor of Lots 802 and 803 (3571) Great Northern Highway, Muchea (subject site). Planning Solutions has prepared the following report in support of an Application for Development Approval for the open-air storage of mining equipment/vehicles and skip bins on the subject site.

This report will discuss various issues pertinent to the proposal, including:

- Site details.
- Proposed development.
- Town planning considerations.

This development application retrospective development approval to resolve the compliance issues identified by the Shire of Chittering (Shire) in its letter dated 14 July 2016. Since receiving this correspondence, the proprietor and Planning Solutions has proactively worked with both the Shire of Chittering and Department of Planning to resolve the identified compliance issues.

The primary land use compliance issues raised by the Shire are in relation to the storage of mining equipment/vehicles and skip bins on the subject site. This development application seeks retrospective approval for these activities (and other similar activities) which are complementary to the existing approved land uses on the subject site and reasonably accommodated on the approved hardstand area.

The proposed activities are capable of approval given the land's Agricultural Resource zoning and additional use classification ('Industry-General' and 'Builder's Storage Yard') under the Shire's Town Planning Scheme No. 6 (TPS6). Furthermore, we understand Amendment 62 to TPS6 has recently been approved by the Minister and introduces a new land use definition for 'Warehouse/Storage', providing further opportunities for the approved hardstand to be used to store a range of goods, equipment, plant or materials.

We respectfully request that the Shire of Chittering grants development approval for these additional activities on site.

1.2 Background

The subject site was previously described as 'Lots 5 and 6 Great Northern Highway', before Main Roads WA (MRWA) acquired part of the site for the Perth Darwin National Highway. The portion acquired by MRWA is known as *Lots 301 and 302 on Deposited Plan 404616*, while the remaining portion comprising the subject site is now formally identified as Lots 802 and 803 (3571) Great Northern Highway.

Amendment 50 to the Shire's TPS6 was published in the Government Gazette on 15 November 2013. Amendment 50 applied an additional use classification to the subject site's Agricultural Resource zoning, to facilitate various industrial activities associated with the construction of transportable buildings.

Existing planning approvals for the subject site are summarised as follows:

- 22 June 2011 – Conditional planning approval granted to former Lot 5 Great Northern Highway for the manufacture of sheds, kit homes and other transportable buildings (and associated/incidental transport and freight operations, temporary storage and open air display of products/materials).
- 22 May 2015 - Conditional planning approval granted to former Lot 6 Great Northern Highway for the construction of hardstand areas, to be used for the Additional Use 17 classification of the land (Industry – General and Builders Storage Yard).

In July 2016, the Shire of Chittering sent a letter to Karratha Enterprises Pty Ltd outlining a number of planning compliance matters requiring resolution. These compliance issues included concerns with the storage of mining equipment/vehicles, and the storage and refurbishment of skip bins, considered by the Shire to fall outside the scope of existing planning approvals for the site.

In response to the identified compliance matters, Planning Solutions has engaged in various discussions with Shire staff to confirm an appropriate planning response and opportunities to resolve the compliance issues through retrospective approval. Subsequent engagement with the Department of Planning (DoP) has also confirmed that:

“...the storage of mining equipment is capable of being approved under the existing zoning, a development application seems to represent the most time-effective and simple approach to resolving the compliance issue.”

A copy of the DoP's letter dated 02 December 2016 is provided at Appendix 1.

2 Site details

2.1 Land description

Refer to Table 1 below for a description of the land subject to this development application.

Table 1 – Lot details

Lot	Deposited Plan	Volume	Folio	Area (ha)
802	404616	2903	23	12.552
803	404616	2903	24	16.991

The subject site is bisected by Lots 301 and 302 (also on Deposited Plan 404616), recently acquired by Main Roads WA for the future Perth Darwin National Highway (PDNH). Lots 301 and 302 do not form part of this scheme amendment proposal.

Refer Appendix 2 for copies of the Certificates of Title and Deposited Plan.

2.2 Location

2.2.1 Regional context

The subject site is located approximately 43.5km north-east of the Perth CBD, 2.5km east of the Muchea townsite, and 23.75km south-west of the Bindoon townsite.

The subject site fronts the Great Northern Highway, a major regional highway which provides access to the wider Wheatbelt region and Mid-West region to the north-east, and the Perth Metropolitan region to the south.

The subject site is also in close proximity to Brand Highway, a major regional highway which provides access to the wider Wheatbelt region, Mid-West region and Gascoyne Region to the north-west.

The subject site is within the municipality of the Shire of Chittering (Shire).

2.2.2 Local context, land use

The subject site is situated within the locality of Muchea. It neighbours an existing transport depot use to the north, Great Northern Highway to the east, a poultry farm to the south and the Ellen Brook to the west.

Further to the north, east and south, the subject site is generally surrounded by industrial and rural land uses on large lots. To the west (beyond the Ellen Brook) are rural lifestyle dwellings on large lots.

The eastern portion of the subject site forms part of the Muchea Employment Node area, a large area planned to accommodate a range of transport, livestock, fabrication, warehousing, wholesaling and other complementary industrial and commercial uses.

The subject site itself is predominantly cleared and contains a large area of constructed hardstand and various operational industrial activities.

Refer Figure 1, aerial photograph.

Photographs 1 to 5 depict the subject site and surrounds.



Photograph 1 – internal accessway throughout site.



Photograph 2 – site office.



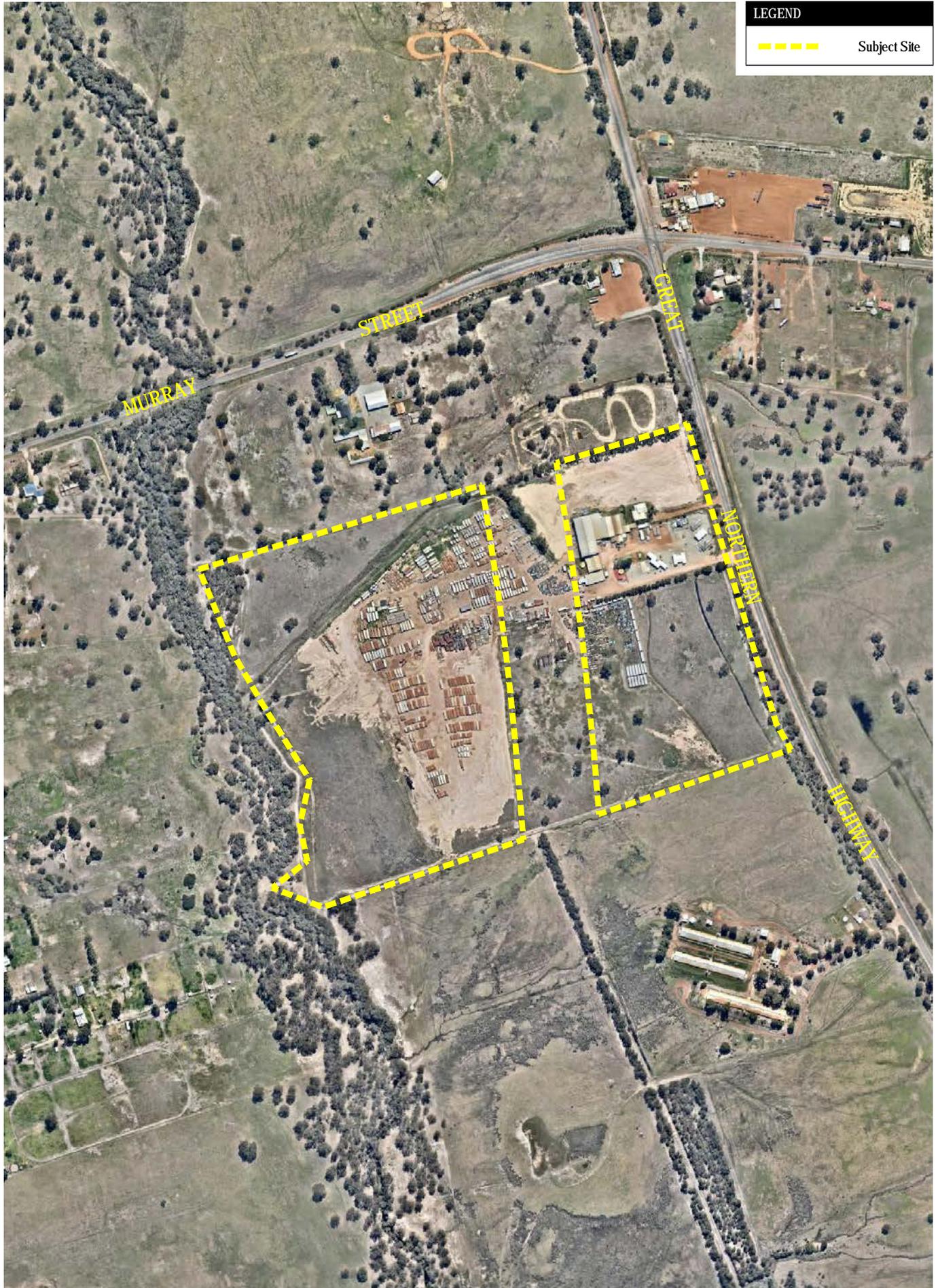
Photograph 3 – transportable building products produced and stored on site.



Photograph 4 – transportable building manufacturing taking place on site.



Photograph 5 – mining plant and equipment stored on site



3 Proposed development

This proposal seeks retrospective development approval to resolve the compliance issues identified by the Shire. This application seeks approval to use the area of approved hardstand on the subject site for activities consistent with the following land use definitions under TPS6:

- Builders Storage Yard;
- Transport Depot; and
- Warehouse/Storage (pursuant to gazettal of Amendment 62 to TPS6).

A description of the activities on site is provided below.

3.1 Subject activities

The subject site is approved for Industry - General and Builders Storage Yard uses, entailing the storage and manufacture of transportable buildings, and the storage of equipment/materials associated with this. The hardstand on which the open-air storage occurs has also previously been approved.

The additional activities subject of this application includes:

- The open air storage of mining equipment and vehicles.
- The open air storage of skip bins, with minor repairs to these skip bins undertaken on-site where necessary (within the existing workshop building already used for industrial purposes associated with transportable building manufacture).
- All other open-air storage activities consistent with the Builders Storage Yard, Transport Depot and Warehouse/Storage land use classes of TPS6.

There are no changes to the existing buildings, vehicle access points or parking arrangements proposed as part of this application.

3.2 Supporting analysis

This development application is supported by the following water management and environmental analysis undertaken by Strategen:

- A water management strategy addressing the sustainable management of water flows on and off the site.
- An environmental report demonstrating the land's general suitability for industrial activities, including the subject site activities, and recommends environmental management measures for the existing site activities.

Refer to Appendix 3 for the Water Management Strategy and Environmental reporting.

4 Statutory planning framework

4.1 Planning and Development Act 2005

The *Planning and Development Act 2005* section 164 provides for the subsequent approval of development, for development already commenced or carried out.

The storage of mining equipment/vehicles and skip bins are already being carried out on site, with retrospective approval sought via this application.

4.2 Planning and Development (Local Planning Schemes) Regulations 2015

The *Planning and Development (Local Planning Schemes) Regulations 2015* (LPS Regulations) operates under the PD Act and sets out the statutory regulations for local planning schemes.

The LPS Regulations at Schedule 2 – Deemed provisions for local planning schemes, Part 9, cl. 65 provides for the subsequent approval of development, for development already commenced or carried out.

The storage of mining equipment/vehicles and skip bins are already being carried out on site, with retrospective approval sought via this application.

4.3 State planning policies

The following State planning policies are relevant to this development application and have been given due regard.

4.3.1 SPP 2.0 Environment and Natural Resources Policy

State Planning Policy 2 – Environmental and Natural Resources Policy (SPP2) sets out the principles and considerations that represent responsible planning in terms of environment and natural resource issues within the State Planning Strategy.

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.*
- *Promote and assist in the wise and sustainable use and management of natural resources.*
- *Relevant provisions of the policy to the proposed rezoning application are that planning strategies, schemes and decision-making should:*
 - (i) *Avoid development that may result in unacceptable environmental damage.*
 - (ii) *Actively seek opportunities for improved environmental outcomes.*
 - (iii) *Take account of the availability and condition of natural resources.*
 - (iv) *Protect significant natural, indigenous and cultural features.*

- (v) *Recognise that certain natural resources are restricted to particular areas and that these geographical areas may need to be identified and protected for the use of those resources.*
- (vi) *Support conservation, protection and management of native remnant vegetation where possible.*

The proposed amendment will not result in unacceptable environmental damage for the following reasons:

- A detailed environmental assessment concludes the land is suitable for the activities being carried out and also sets out management measures to ensure the activities will result in minimal environmental impacts.
- A local water management strategy addresses the flow of water through the site, having regard to the Ellen Brook situated to the rear of the site. The strategy confirms water flows are acceptable and capable of being managed.

4.3.2 SPP 3.7 Planning in Bushfire Prone Areas

State Planning Policy 3.7 - Planning in Bushfire Prone Areas (SPP3.7) seeks to implement effective, risk-based land use planning and development to preserve life and reduce the impact of bushfires on property and infrastructure.

The subject site is situated within an area (broadly covering the entire townsite and surrounds) which is identified as 'bushfire prone' by the Department of Fire and Emergency Services (DFES).

In accordance with Planning Bulletin 111/2016 – Planning in Bushfire Prone Areas (PB111/2016), this proposal is exempt from the requirements of SPP3.7. Specifically, PB111/2016 states that:

The deemed provisions apply to all local planning schemes, prepared under the Planning and Development (Local Planning Schemes) Regulations 2015. These provisions work in conjunction with SPP 3.7, and apply to development (or use) and/or construction of habitable buildings within bushfire prone areas.

A habitable building is defined as:

...any fully or partially enclosed structure, with at least one wall and a roof made of solid material, and used by people to:

- *live (house, apartment or hostel);*
- *work (office, factory or hospital),*
- *study (school, university or library); or*
- *socialise or entertain (gym, theatre, restaurant or community facility).*

This proposal does not meet the above listed definition of habitable building, as it is for the open-air storage of mining equipment vehicles and skip bins on an approved hardstand area. Therefore, as no habitable building is requiring development approval with this application, the SPP3.7 bushfire requirements are not applicable and as such the proposal is exempt from the requirements of SPP3.7. Notwithstanding this, the existing buildings on-site were approved prior to the SPP3.7 bushfire requirements coming into effect.

4.3.3 Draft SPP 4.1 State Industrial Buffer Policy (Amended)

State Planning Policy 4.1: State Industrial Buffer Policy (SPP4.1) was adopted in 1997 to provide a consistent State-wide approach for the protection and long-term security of industrial zones, transport terminals (including ports), other utilities and special uses. In 2009, the WAPC released a draft revision of SPP4.1 for public comment.

SPP4.1 notes that industry and infrastructure, by their very nature, may generate a range of emissions of pollutants including noise, dust, gas, odour, fumes, lighting overspill as well as risk levels which may not be compatible with other land uses. As a result, most industries and infrastructure as well as some other uses need to be separated from residential areas and other sensitive uses with a buffer area to ensure that amenity (environmental quality, health and safety standards) is maintained at acceptable levels.

The objectives of SPP4.1 are as follows:

- *Avoid conflict between industry and/or essential infrastructure and sensitive land uses;*
- *Protect industry and/or essential infrastructure from encroachment by those land uses that would be sensitive to impacts and adversely impact the efficient operations;*
- *Provide for the development of industry and/or the provision of essential infrastructure in a way that maximises amenity, minimises environmental and health impacts and takes account of risk to nearby sensitive land uses; and*
- *Promote compatible uses within areas affected by off-site impacts of industry and/or essential infrastructure.*

The proposal is consistent with SPP4.1, and will not result in undue impacts on nearby rural residential properties to the west for the following reasons:

- The purpose of this development application is to reflect and gain approval for the activities already being carried out on the site.
- The Rural Residential dwellings to the west are separated from the subject site by the Ellen Brook and associated watercourse buffers on either side.
- The subject site contains operational industrial activities (Builders Storage Yard and associated transport/storage), which were facilitated by Amendment 50 to TPS6. At the time, Amendment 50 was considered by the Shire and WA Planning Commission, no undue impacts were considered to result from these activities.
- The nearest 'sensitive premises' are west of the site, zoned Rural Residential with no applicable density coding under TPS6. The lots themselves are barriered from the site by the Ellen Brook, which contains large trees screening view of the subject site. The lots range in size from 5.7ha to 6.6ha, with the dwellings generally situated a minimum 400m from the boundary of the subject site.
- The subject site neighbours a poultry farm to the south, with the associated 500m nominal poultry farm buffer covering most of the subject site. This area is therefore already unsuitable for further sensitive uses.

4.4 Shire of Chittering Town Planning Scheme No. 6

4.4.1 Zoning and additional use classification

The subject site is zoned Agricultural Resource under the Shire's Town Planning Scheme No. 6 (TPS6). An Additional Use classification (A17) also applies to the subject site, and extends the range of permitted land uses to include 'Industry-General' and 'Builders Storage Yard' subject to a number of conditions. These conditions include limitations on any 'Industry-General' land use to the manufacture, assembly, storage and transportation of transportable buildings. There are no such limitations on the 'Builders Storage Yard' land use permitted under A17.

Refer to Figure 2 - zoning map.

4.4.2 Land use classification

The storage of commercial mining vehicles on-site is consistent with the TPS6 land use class of Transport Depot, defined in Schedule 1 of the Scheme as follows:

Transport Depot - means premises used or intended for use for the parking or garaging of:

- a) *two or more motorised commercial vehicles with or without any number of non-motorised commercial vehicles; or*
- b) *two or more non-motorised commercial vehicles with or without any number of motorised commercial vehicles;*
and the use includes the maintenance and repair of vehicles so parked or garaged on the land but not of other vehicles.

A Transport Depot is classified as an 'A' land use within the Agricultural Resource zone, and is capable of being approved at the discretion of the Local Government following advertising in accordance with Clause 9.4 of TPS6.

The land use classification applicable to the storage and minor refurbishment of skip bins is consistent with the TPS6 land use class of Builders Storage Yard, defined in Schedule 1 of the Scheme as follows:

Builders Storage Yard - Means premises used for the storage of building material, pipes or similar items related to any trade, and may include the manufacture, assembly and dismantling process incidental to the predominant use.

The Builders Storage Yard land use class is Permitted (P) on the subject site, by virtue of Additional Use Classification A17. Skip bins are principally used in the building trade and used for the on-site collection of building waste etc. Furthermore, the storage and minor refurbishment of skip bins is incidental to the predominate approved land use on site, which is the manufacturing, assembly and storage of transportable buildings. This view has been affirmed in the Department of Planning's letter – refer to Appendix 1.

Notwithstanding the existing land use classes in TPS6 identified above, Amendment 62 (recently approved by the Minister for Planning) introduces a new land use classification of Warehouse/Storage, consistent with Schedule 1 of the LPS Regulations and defined as follows:

Warehouse/Storage - Means premises including indoor or outdoor facilities used for —
(a) the storage of goods, equipment, plant or materials; or
(b) the display or sale by wholesale of goods;

This matter has also been confirmed by the DoP in its letter dated 2 December 2016 (Appendix 1).

The open-air storage of mining equipment/vehicles and skip bin storage, are also generally consistent with the above pending Warehouse/Storage land use classification.

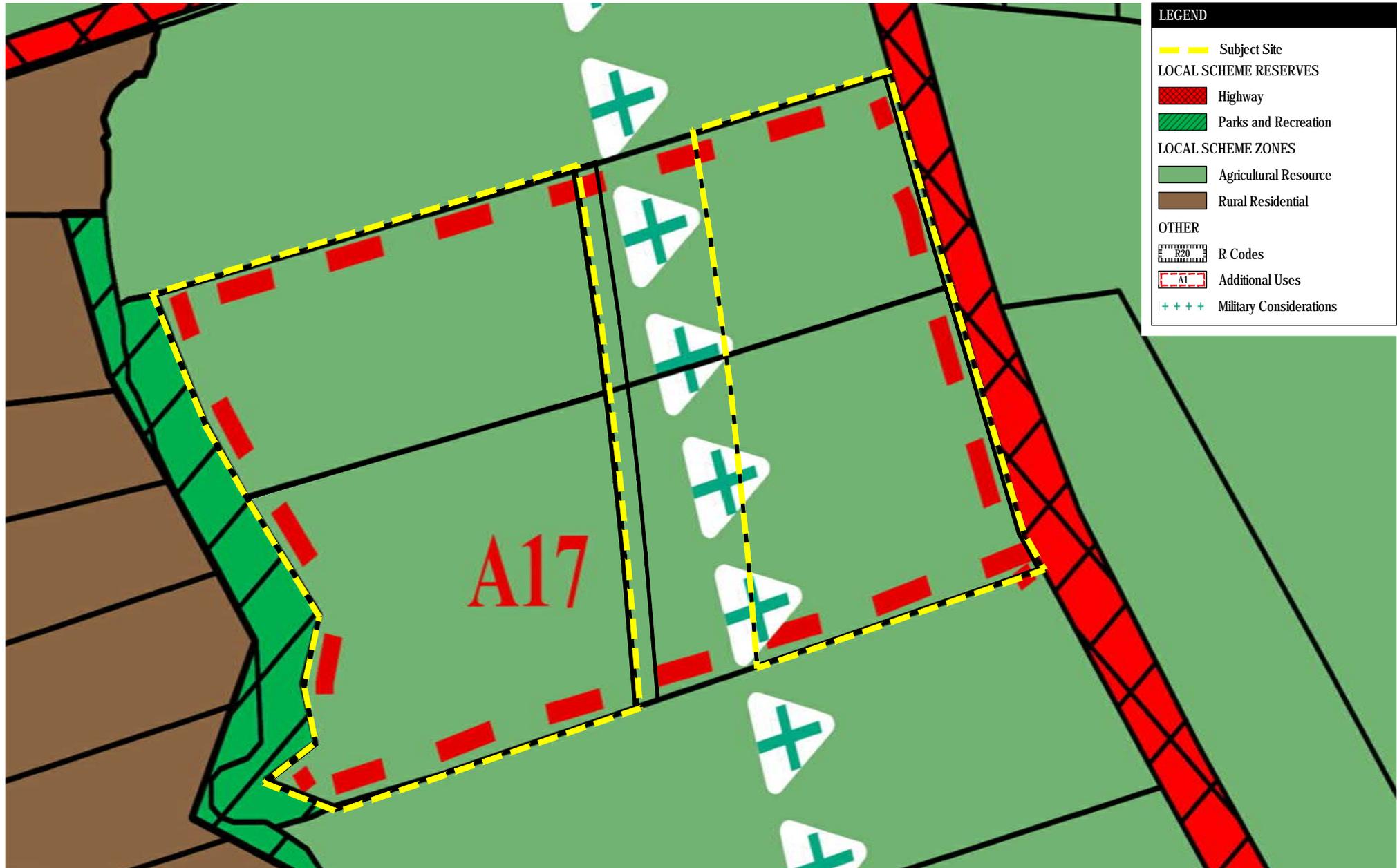
4.5 Muchea Employment Node Structure Plan

The Muchea Employment Node Structure Plan (MENSP) was prepared to assess the capability of land within its boundaries for future industrial expansion, and identify long-term opportunities for the growth of complementary industrial and commercial uses. The subject site is partly within Precinct 3 – West of the MENSP. The document acknowledges that this precinct contains existing industrial activities, including shed fabrication, transport depots and poultry farming.

The LPS Regulations at Schedule 2 – Deemed provisions for local planning schemes, Part 4, cl. 27(1), states that,

A decision-maker for an application for development approval or subdivision approval in an area that is covered by a structure plan that has been approved by the Commission is to have due regard to, but is not bound by, the structure plan when deciding the application.

This application seeks approval for additional activities which are complementary to the existing approved uses of Industry – General and Builders Storage Yard, and will not adversely impact future implementation of the MENSP. Longer term structure planning and rezoning of the land will need to be assessed against MENSP objectives and requirements.



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5 Environmental considerations

5.1 Environmental report

Strategen undertook a environmental review of the subject site to confirm the land's suitability for proposed activities and appropriate environmental management measures required. The review acknowledges the presence of the Ellen Brook to the rear of the site and undertakes an analysis of the existing site conditions, including:

- Topography – slight slope from east to west.
- Soils – sand (quartz and feldspar) within the vicinity of the Ellen Brook; pebbly silt throughout the remainder of the site.
- Groundwater and surface water – majority of site part of a multiple use palusplain or seasonally waterlogged flat. The site grades generally to the west, noting the location of the Ellen Brook.
- Flora and fauna – site cleared, with a generally low habitat value.

The environmental report concludes the subject site is capable of accommodating the proposed activities with appropriate management measures, and that the proposed use of the subject site is considered to be environmentally acceptable.

Refer Appendix 3 for the Environmental reporting prepared by Strategen.

5.2 Local water management

Strategen Environmental also prepared a water management strategy in support of this development application..

The document undertakes an analysis of existing site conditions, including:

- Mediterranean climate (hot dry summers and mild wet winters).
- Topography – slight slope from east to west.
- Soils – sand (quartz and feldspar) within the vicinity of the Ellen Brook; pebbly silt throughout the remainder of the site.
- Groundwater and surface water – majority of site part of a multiple use palusplain or seasonally waterlogged flat. The site grades generally to the west, noting the location of the Ellen Brook.
- Flora and fauna – site predominantly cleared, with a generally low habitat value.

Based on existing site conditions, the water management strategy includes an assessment of various water management design criteria, as set out by various State and local policies and guidelines.

Based on this assessment, the water management strategy concludes that the proposed land uses are environmentally acceptable subject to appropriate management of water quality and volumes, which would meet the management criteria set out by the Shire of Chittering and Department of Water.

Refer Appendix 3 for the Water Management Strategy.

5.3 Bushfire management

As outlined at section 4.3.2 above, there are no habitable buildings proposed as part of this application, and therefore, SPP3.7 bushfire requirements are not applicable and that the proposal is exempt from the requirements of SPP3.7.

6 Conclusion

This development application seeks retrospective approval for Transport Depot, Builders Storage Yard and Warehouse/Storage land uses on the subject site, within the area already approved for hardstand purposes.

In summary, this Application for Development Approval is capable of approval under TPS6 and responds to the Shire's compliance concerns at the site, for the following reasons:

- The proposed activities are consistent with and complementary to existing activities already occurring on the subject site and reasonably expected to occur on an approved hardstand area.
- The Department of Planning has advised that,
...the storage of mining equipment is capable of being approved under the existing zoning, a development application seems to represent the most time-effective and simple approach to resolving the compliance issue.
- This application is supported by a water management strategy addressing the sustainable management of water flows on and off the site.
- This application is supported by an environmental report demonstrating the land's suitability for the on site activities, and recommends environmental management measures for the existing site activities.

We respectfully request that the Shire of Chittering grants development approval for these additional activities on site.

Appendix 1
Department of Planning letter dated 2 Dec 2016

Appendix 2
Certificates of Title and Deposited Plan

Appendix 3
Water Management Strategy and
Environmental Report



Government of **Western Australia**
Department of **Planning**

Your ref: Addressee's Ref
Our ref: DP-11-01176/2
Enquiries: Ryan Shaw [REDACTED]

Mr Scott Vincent
Senior Planner
Planning Solutions
GPO Box 2709
CLOISTERS SQUARE PO 6850

Transmitted by email only to: scott.vincent@planningsolutions.com.au

Dear Scott

**LOTS 802 AND 803 (FORMERLY LOT 5 & 6) GREAT NORTHERN HIGHWAY,
MUCHEA – ADVICE ON PLANNING ARRANGEMENTS**

Thank you for your enquiry of 17 November 2016 regarding a suitable planning approach for the above land. The information is provided as general advice in keeping with Section 14(d) of the *Planning and Development Act 2005*.

The information you provided to the Department has been reviewed, along with a compliance report provided by the Shire, the documentation associated with Amendment 50 that created the additional use and the provisions of the Shire's Town Planning Scheme No. 6 (Scheme). Based on the information provided, it is concluded that:

1. The manufacture, assembly, storage and transportation of transportable buildings are uses permitted under the site's 'Additional Use 17' ('A17').
2. The hardstand area on former Lot 6 is consistent with the development application approved on 22 May 2015.
3. The use and maintenance of skip bins could be incidental to the predominant land use, which is the manufacture and assembly of transportable buildings. However, the Department has not viewed the development approval issued, which may or may not have made provision for a specific part of the site.
4. The outstanding issue is the storage of mining-related equipment on site. This issue is discussed in the following paragraphs.

The Minister for Planning has recently determined Amendment 62 to the Scheme, which converts the Scheme into the new format provided for in the *Planning and Development (Local Planning Schemes) Regulations 2015*. Some of the changes in the amendment relate to definitions, including deleting 'storage' from the Zoning Table and adding the new 'model' definition for 'warehouse / storage'.

The definition for 'warehouse / storage' provides for the '*indoor or outdoor storage of goods, equipment, plant or materials*', which seems to be the land use that most closely aligns with storage of mining equipment. Gazettal of Amendment 62 (which is expected to occur shortly) provides Council with the discretion to approve the outdoor storage of mining-related equipment on the site.

While it is likely that land in Precinct 3 of the *Muchea Employment Node Structure Plan* (MENSP) will eventually convert to industrial zoning, most lots in Precinct 3 need to undertake structure planning at, or near zoning stage in order to make provision for the planned service road shown in Figure 8 of the MENSP. In contemplating a 'spot' rezoning for Lots 802 and 803, the ability to develop the estate in a co-ordinated manner would be critical. Proceeding to industrial zoning in an ad-hoc manner may prejudice the orderly and proper planning of the MENSP.

As the storage of mining equipment is capable of being approved under the existing zoning, a development application seems to represent the most time-effective and simple approach to resolving the compliance issue.

Thank you for raising this matter with me. I hope the information set out in this letter is of assistance. If you would like to discuss further with an officer at the Department, please contact Ryan Shaw in the Wheatbelt Team on [REDACTED].

Yours sincerely

[REDACTED]

Cath Meaghan
Director - Wheatbelt Region

2 December 2016

WESTERN



AUSTRALIA

REGISTER NUMBER 803/DP404616	
DUPLICATE EDITION N/A	DATE DUPLICATE ISSUED N/A

RECORD OF CERTIFICATE OF TITLE
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME
2903FOLIO
24

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

**LAND DESCRIPTION:**

LOT 803 ON DEPOSITED PLAN 404616

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

KARRATHA ENTERPRISES PTY LTD OF POST OFFICE BOX 419, MORLEY BC
(AF N339403) REGISTERED 27 MAY 2016

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. *EXCEPT AND RESERVING METALS, MINERALS, GEMS AND MINERAL OIL SPECIFIED IN TRANSFER 3000/1933.
2. *L740226 MORTGAGE TO BANK OF WESTERN AUSTRALIA LTD REGISTERED 22.9.2011.
3. *N004750 CAVEAT BY AUSSIE MODULAR SOLUTIONS PTY LTD LODGED 20.5.2015.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP404616.
PREVIOUS TITLE: 1689-590.
PROPERTY STREET ADDRESS: 3571 GREAT NORTHERN HWY, MUCHEA.
LOCAL GOVERNMENT AREA: SHIRE OF CHITTERING.

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING L740226

WESTERN



AUSTRALIA

REGISTER NUMBER 802/DP404616	
DUPLICATE EDITION N/A	DATE DUPLICATE ISSUED N/A

RECORD OF CERTIFICATE OF TITLE
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME
2903FOLIO
23

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

**LAND DESCRIPTION:**

LOT 802 ON DEPOSITED PLAN 404616

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

KARRATHA ENTERPRISES PTY LTD OF 50 CLUNE STREET, BAYSWATER
(AF N339403) REGISTERED 27 MAY 2016

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. *EXCEPT AND RESERVING METALS, MINERALS, GEMS AND MINERAL OIL SPECIFIED IN TRANSFER 3000/1933.
2. *M523097 MORTGAGE TO NATIONAL AUSTRALIA BANK LTD REGISTERED 16.1.2014.
3. *N001942 CAVEAT BY AUSSIE MODULAR SOLUTIONS PTY LTD AS TO PORTION ONLY LODGED 18.5.2015.
4. *N001943 CAVEAT BY KELAIR HOLDINGS PTY LTD AS TO PORTION ONLY LODGED 18.5.2015.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP404616.
PREVIOUS TITLE: 1689-591.
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AREA: SHIRE OF CHITTERING.

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING L324122



intelligent outcomes | respected experience

Lots 802 and 803 Great Northern Highway

Water Management Strategy

Prepared for
Planning Solutions
by Strategen

February 2017

Lots 802 and 803 Great Northern Highway

Water Management Strategy

Strategen is a trading name of
Strategen Environmental Consultants Pty Ltd
Level 1, 50 Subiaco Square Road Subiaco WA 6008
ACN: 056 190 419

February 2017

Limitations

Scope of services

This report ("the report") has been prepared by Strategen Environmental Consultants Pty Ltd (Strategen) in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen has also not attempted to determine whether any material matter has been omitted from the data. Strategen will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen. The making of any assumption does not imply that Strategen has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

Client: Planning Solutions

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Preliminary Draft Report	A	Client review	M Dunlop/ D Newsome	Electronic	20/10/16
Draft Report	B	Client review	M Dunlop/ D Newsome	Electronic	1/11/16
Final Draft Report	C	Client review	M Dunlop/ D Newsome	Electronic	17/1/17
Revised Final Draft Report	D	Client review	M Dunlop/ D Newsome	Electronic	20/1/17
Final	0	Agency submission	M Dunlop/ D Newsome	Electronic	10/2/17

Filename: PSO16487_01 R002 Rev 0 - 10 February 2017

Executive Summary

Karratha Enterprises wish to seek retrospective development approval for additional storage activities taking place (specifically mining equipment/vehicles and skip bins) at Lots 802 and 803 Great Northern Highway, Muchea (the site). The site is located approximately 40km north-north-east of Perth in the Shire of Chittering (Shire) and has total area is 29.543 ha. The proposed Perth-Darwin Highway is located in the centre of the Site, and this land is held by Main Roads WA (MRWA).

The northern portion of the site is approved for the manufacture of sheds, kit homes and other transportable buildings (and associated/incidental transport and freight operations, temporary storage and open air display of products/materials). The southern portion of the site is approved for the construction of raised semi-permeable pavement (SPP) hardstand area for transportable building manufacture and associated storage activities.

This Water Management Strategy (WMS) has been prepared to support the planning application and confirm any best practice measures recommended with regard to water management, including any future measures likely required to be implemented once MRWA formally implement the road construction works.

With the implementation of the proposed stormwater design system, the site can meet the water management criteria set by the Shire and Department of Water (Table ES 1).

Table ES 1: Water management criteria and compliance

Aspect	Guiding document	Criteria	Compliance
Water quality and quantity management (flood management)	<i>LPP 16</i> (Shire of Chittering 2007)	<u>Criteria 1:</u> Drainage required as a result of road construction or other development is to be provided by the subdivider and/or developer in accordance with water sensitive design principles, to the satisfaction of Council's CEO as follows: Outside town sites within the Ellen Brook Palusplain – appropriate collection and on-site disposal of stormwater, with drainage designed for one in five year ARI rainfall events.	Yes. Section 5.3.
	<i>Decision Process for Stormwater Management in WA</i> (DoW 2009) <i>Water Quality Protection Note 52</i> (DoW 2006)	<u>Criteria 2:</u> retain/treat the 1yr, 1 hr ARI on-site.	Yes. Section 5.3.
		<u>Criteria 3:</u> Manage run-off from constructed impervious areas for greater than 1yr 1hr ARI events up to 100 yr ARI events in landscaped retention or detention areas [discharge ≤ pre-development peak flows]. Runoff into waterways and wetlands shall be by overland flow paths across vegetated surfaces.	Yes. Section 5.3.
		<u>Criteria 4:</u> Protect the built environment from flooding and waterlogging. Management of seasonal peak groundwater levels through a controlled groundwater level (CGL) to take into consideration the environment.	Yes. Key infrastructure protected from waterlogging (Section 5.2).
		<u>Criteria 5:</u> Controlled release points should be built into any stormwater retention basin to avoid embankment failures under extreme rainfall conditions.	Yes. Section 5.3.2.
Water quality management	<i>Muchea Employment Node Structure Plan</i> (WAPC 2011)	<u>Criteria 6:</u> Treatment in bioretention basin.	Yes. Proposed swales sized and planted to act a bioretention structures (Section 5.3.2, 5.3.3).

Aspect	Guiding document	Criteria	Compliance
Industrial water quality	<i>Water Quality Protection Note 52 (DoW 2006)</i>	<u>Criteria 7</u> : If applicable land use, fuel oil and grease removal required prior to release to stormwater system.	Yes. Future refuelling point will have an oil separator (Section 5.3.3).
		<u>Criteria 8</u> : Chemicals storage and handling in separate containment area.	Yes. Implementation of chemical and fuel management as per Environment Report (Sections 5.3.3).

Table of contents

1. Introduction	1
1.1 Background	1
1.2 Scope	1
2. Existing environment	5
2.1 Climate	5
2.2 Topography	5
2.3 Soils	5
2.4 Groundwater and surface water	7
2.5 Flora and fauna	8
3. Activities undertaken on the site	13
3.1 Demountable building construction and storage	13
3.2 Skip bin storage and refurbishment	13
3.3 Vehicle and machinery storage	13
4. Design criteria and objectives	15
5. Water management design	17
5.1 Water servicing	17
5.2 Finished levels	17
5.3 Stormwater management	17
5.3.1 Stormwater calculations	17
5.3.2 Proposed stormwater structures	18
5.3.3 Water quality management	19
6. Stormwater operational management	23
6.1 Environmental objectives, targets and key performance indicators	23
6.2 Management actions	23
6.3 Monitoring and reporting	23
6.4 Contingency measures	24
7. References	25

List of tables

Table 1: Water management criteria and compliance	15
Table 2: Assumptions	17
Table 3: Basin details and results	18
Table 4: Environmental objectives, targets and key performance indicators for stormwater	23
Table 5: Management actions for stormwater	23
Table 6: Stormwater monitoring and reporting requirements	24
Table 7: Contingency measures for stormwater	24

List of figures

Figure 1: Site layout	3
Figure 2: Soils and topography	9
Figure 3: Approved works	10
Figure 4: Surface water	11
Figure 5: Catchment plan	21

List of plates

Plate 1: Semi-pervious pavement	6
Plate 2: New SPP area adjacent to drain on the southern boundary of the site	7
Plate 3: Drain in the south-east of the site showing groundwater close to the surface	8
Plate 4: Vehicle and machinery storage	14

List of appendices

Appendix 1 Stormwater calculations
Appendix 2 Environmental report

1. Introduction

1.1 Background

Karratha Enterprises wish to seek retrospective development approval for additional storage activities taking place (specifically mining equipment/vehicles and skip bins) at Lots 802 and 803 Great Northern Highway, Muchea (the site). The site is located approximately 40km north-north-east of Perth in the Shire of Chittering (Shire) and has total area is 29.543 ha. The proposed Perth-Darwin Highway is located in the centre of the Site, and this land is held by Main Roads WA (MRWA).

The northern portion of the site is approved for the manufacture of sheds, kit homes and other transportable buildings (and associated/incidental transport and freight operations, temporary storage and open air display of products/materials). The southern portion of the site is approved for the construction of raised semi-permeable pavement (SPP) hardstand area for transportable building manufacture and associated storage activities.

The lots abut Ellen Brook Foreshore Reserve to the west (Figure 1). The proposed Perth-Darwin Highway (PDH) is located in the centre of the site, and this land is held by MRWA (Figure 1).

This Water Management Strategy (WMS) has been prepared to support the planning application and confirm any best practice measures recommended with regard to water management, including any future measures likely required to be implemented once MRWA formally implement the road construction works.

1.2 Scope

The scope of works is to prepare a water management strategy to address the sustainable management of water flows on/off site and have regard for the Ellen Brook located to the rear of the site in the context of the current land uses on the site.

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Lots 802 and 803 Great Northern Highway
Site Layout

Figure
1

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2. Existing environment

2.1 Climate

The climate is Mediterranean, characterised by hot dry summers and mild wet winters. The long term annual average rainfall (1912 – 2013) is 747.5 mm at the Muchea Tree Farm BoM station (9029), with 79% of rainfall occurring between May and September. However, the short term annual average rainfall (1981 – 2013) is 667.4 mm, 11% lower than the long term average.

Average annual pan evaporation for Muchea is approximately 1950 mm.

2.2 Topography

The 2011 LIDAR is the most recent topography available for the whole site, and indicates the site varies from approximately 53 mAHD in the east Great Northern Highway to 44 mAHD in the west adjacent to Ellen Brook. The natural grade on the site is approximately 1 in 100. The north-west portion of the site was also graded at an approximate grade of 1 in 100 at the time of the LIDAR survey.

Earthworks have been undertaken on the site since 2011 to raise the site and were ongoing at the time of writing, as approved by the Shire.

The PDH will have an overpass to the Brand Highway approximately 250 m north of the Site. The overpass of the Brand Highway is anticipated to result in the PDH being above the current levels of the Site and may require the relocation of some drainage infrastructure on the Site to ensure that existing drainage matches in with proposed MRWA culverts (AMS 2015).

2.3 Soils

Site geology is mapped by Gozzard (1982) as:

- Sand - light grey, medium grained, sub-angular to rounded quartz and feldspar, moderately sorted, in the vicinity of Ellen Brook
- Pebbly Silt (Guildford Formation) - strong brown silt with common fine to occasionally coarse grained, sub rounded laterite, quartz, heavily weathered granite pebbles, some fine to medium grained quartz sand of alluvial origin (Figure 1).

Strategen undertook a site inspection on 30 September 2016. The soils in the undeveloped parts of the site appeared to be variable, including fine clayey sands, sandy clays and peaty sand materials.

The site is mapped as having low to no risk of Acid Sulphate Soils (ASS) over most of the Site. The area adjacent to Ellen Brook is mapped as having a moderate to low risk of ASS occurring within 3 m of the natural surface.

Portions of the Site that contain buildings and/or are currently used for vehicle and demountable storage have been filled and raised to a level above the remainder of the Site. Karratha Enterprises are currently raising and filling the site in accordance with planning approvals and the previous Stormwater Management Plan (SMP [AMS 2015] Figure 3).

Pavement construction

Karratha Enterprises are currently converting areas of the site to hardstand as approved by the Shire (AMS 2015, Figure 3). The 'hardstand' consists of compacted sand covered by engineered fill and resembles a compacted gravel road (Plate 1).



Plate 1: Semi-pervious pavement

Based on the site inspection and information provided in the SMP (AMS 2015) the material is considered to be semi-permeable. The SPP is constructed of a layer of 0.3 to 1.2 m of sand overlain with minimum of 0.3 m of engineered fill with greater than 80% of particles having a size of between 0.1 and 1 mm (AMS 2015), equivalent to a fine to medium grained sand. Plate 2 shows the edge of the new SPP and the separation from the pre-development levels. The engineered fill is compacted with a roller. The material has been sourced from an approved recycling facility and passes appropriate health and environmental standards for use in commercial and industrial areas (AMS 2015).

Ponding was noted in areas of SPP, despite the lack of rain in the two days prior to the site inspection (Plate 1). There was no evidence of drainage pathways or erosion from the new SPP, indicating the material is relatively permeable.



Plate 2: New SPP area adjacent to drain on the southern boundary of the site

2.4 Groundwater and surface water

The majority of the site is mapped by Department of Parks and Wildlife as part of a multiple use palusplain or seasonally waterlogged flat (Figure 4). At the time of site inspection on 30 September 2016, portions of the Site that had not been filled were largely waterlogged, with water at or close to the ground surface (Plate 3). This is consistent with the palusplain definition and investigations by JDA (2016) on a nearby site to the north.



Plate 3: Drain in the south-east of the site showing groundwater close to the surface

The site contains a large drain which runs in an approximately east-west direction across the Site, before heading south-west towards Ellen Brook (Figure 4). A number of smaller drains are also present along the edge of the road (Figure 4). Where new areas of SPP are proposed in the south of the site, drains within the SPP area are being relocated to the edge of the SPP area to ensure continuation of flow paths.

The site has been subject to areas of ponding during winter and storm events (AMS 2015).

At the time of inspection by Strategen on 30 September 2016, ponding was present on older areas of SPP in the north of the Site, most likely due to local rainfall. The most recent rain at Muchea prior to the site inspection was 9.6 mm on 28 September (BoM 2016).

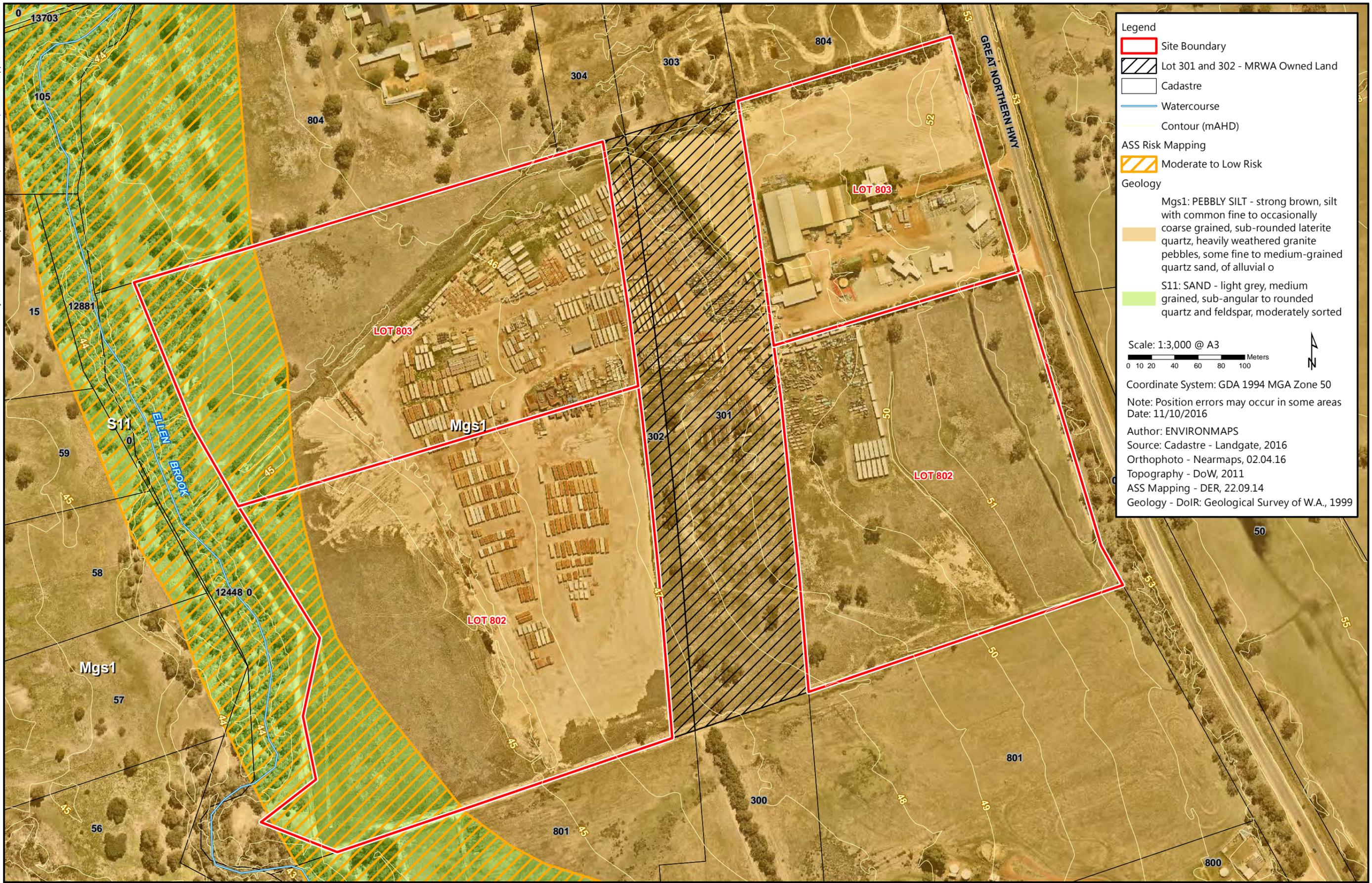
Roof run-off from the office building and main shed are collected in rainwater tanks for in-building use.

Flood mapping of Ellen Brook is not available for the site (Rodgers S [DoW] 2016, pers. comm. 5 October).

2.5 Flora and fauna

The site has been historically cleared. The undeveloped portions of the site are cleared paddocks with the occasional tree. The habitat value of the site is considered to be very low.

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Legend

- Site Boundary
- Lot 301 and 302 - MRWA Owned Land
- Cadastre
- Watercourse
- Contour (mAHD)

ASS Risk Mapping

- Moderate to Low Risk

Geology

- Mgs1: PEBBLY SILT - strong brown, silt with common fine to occasionally coarse grained, sub-rounded laterite quartz, heavily weathered granite pebbles, some fine to medium-grained quartz sand, of alluvial o
- S11: SAND - light grey, medium grained, sub-angular to rounded quartz and feldspar, moderately sorted

Scale: 1:3,000 @ A3

0 10 20 40 60 80 100 Meters

Coordinate System: GDA 1994 MGA Zone 50

Note: Position errors may occur in some areas

Date: 11/10/2016

Author: ENVIRONMAPS

Source: Cadastre - Landgate, 2016

Orthophoto - Nearmaps, 02.04.16

Topography - DoW, 2011

ASS Mapping - DER, 22.09.14

Geology - DoIR: Geological Survey of W.A., 1999



Lots 802 and 803 Great Northern Highway
Soils and Topography

Figure
2

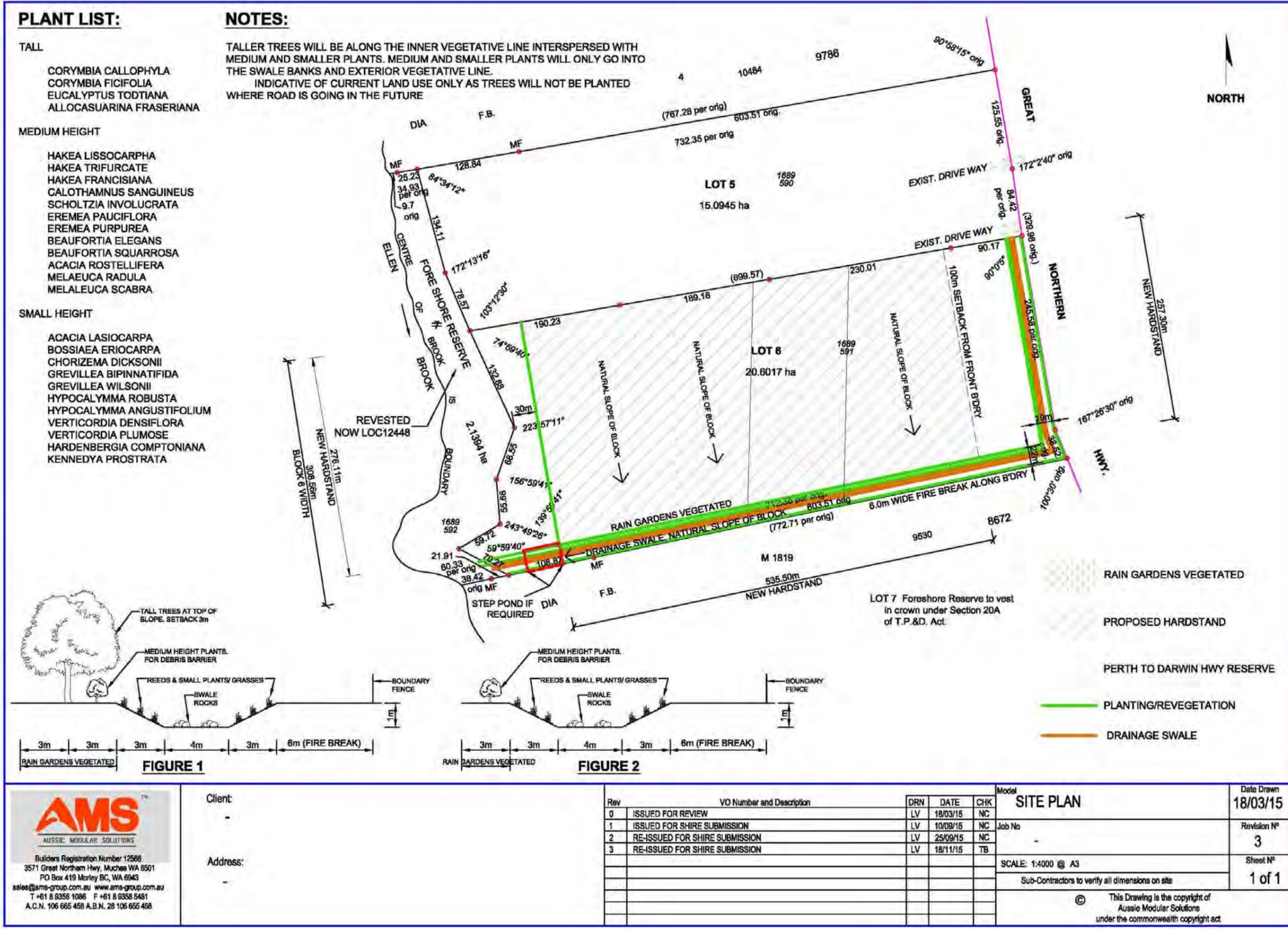
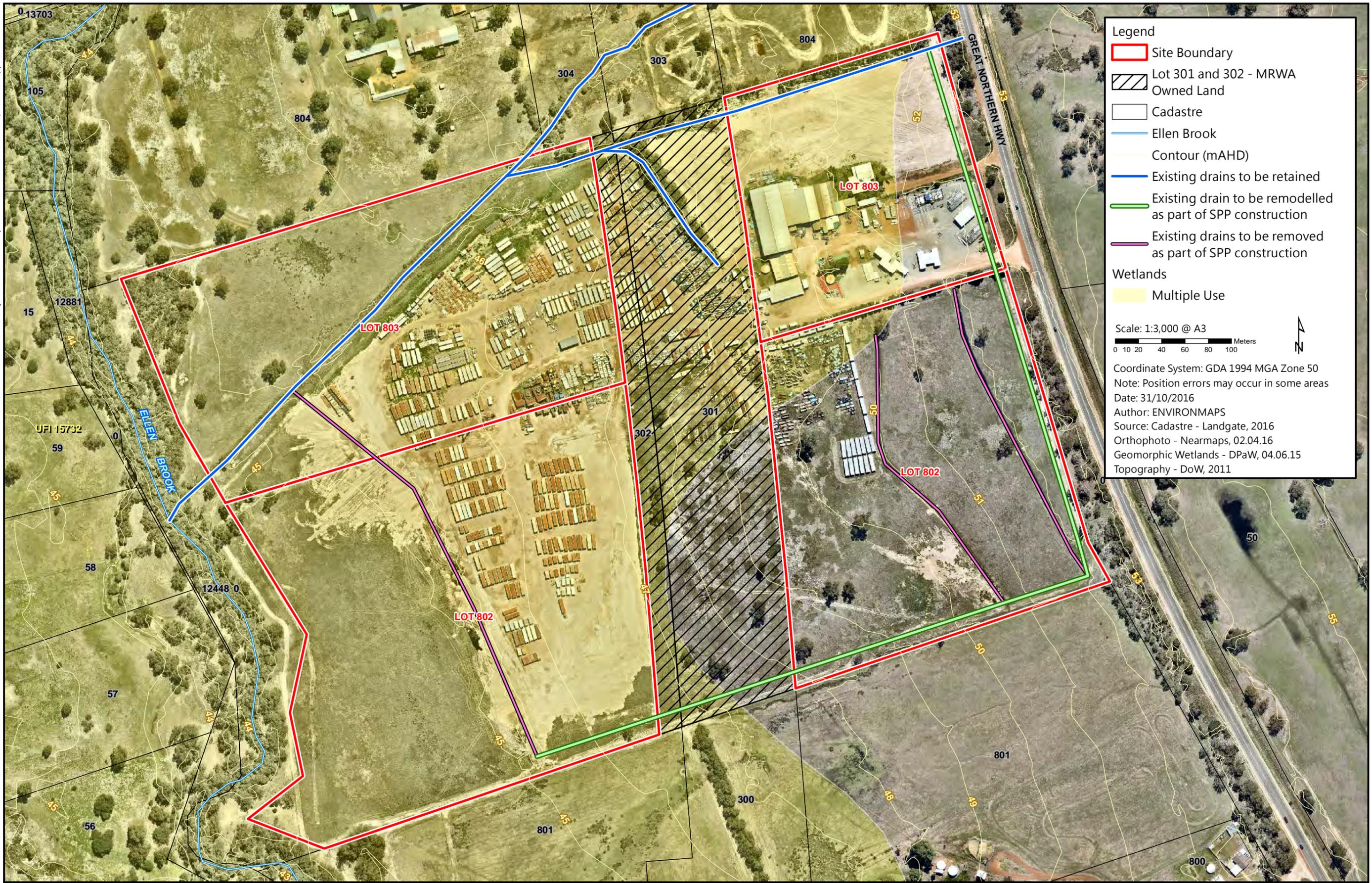


Figure 3: Approved works

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Lots 802 and 803 Great Northern Highway
 Surface Water

Figure
 4

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3. Activities undertaken on the site

This section provides a summary of the activities undertaken on the site and the potential environmental risks posed by these activities. Non-stormwater based management measures to mitigate the impacts of these activities are discussed in the Environmental Report (Strategen 2016).

3.1 Demountable building construction and storage

Because of the size of the transportable buildings, construction of demountable buildings occurs largely outdoors. The construction process involves welding of material to construct frames and the use of pre-fabricated materials such as bonded steel, marine ply wood and expanded foam. This limits the requirement for the use of chemicals such as paints and glues in construction. Small volumes of paints and glues are stored on the site for use in transportable construction.

Empty demountables are also stored on the property. Empty demountables are not considered to pose a potential risk to the environment.

Because construction involves the risks to the environment and waterways associated with demountable construction and storage are considered to be low.

3.2 Skip bin storage and refurbishment

Skip bins are bought to the site for storage and stored on a SPP area. Skip bins are cleaned prior to entering the site.

Where skip bins are found to be damaged, these are repaired within the existing approved workshop. Skip bin repairs are undertaken in a building already fitted out and being used for similar activities, including metal structure fabrication of demountable buildings.

3.3 Vehicle and machinery storage

Mining vehicles and associated machinery are stored on site on behalf of Downer, who rent a portion of the site (Plate 4). The machinery is stored on SPP areas. Plant and equipment are cleaned before entering site to prevent contaminants, including weed seeds and hydrocarbons, entering the site.



Plate 4: Vehicle and machinery storage

Downer has prepared their own environmental management plan for the storage (Downer, undated) which includes spill management procedures. Downer undertakes environmental inspections on a minimum of quarterly (typically monthly) basis. All non-conformances, corrective actions and opportunities for improvements that are identified through inspections and audits are recorded and managed through Downer's internal audit process.

No evidence of leakage of fuels or hydrocarbons from the vehicles was noted during the site inspection. Karratha Enterprises advises that vehicles are drained of fuel prior to entering the site (Carrington N [Karratha Enterprises] 2016, pers. comm. 30 September).

The storage of vehicles and machinery on the Site has the potential to result in leaks of fuel and other hydrocarbons such as oil and grease. Given the permeability of the SPP, spilled or leaked hydrocarbons may be absorbed into the soil and enter groundwater. As the vehicles and machinery are not used on the site, the main source of hydrocarbons is likely to be leaks, which are likely to be slow and of comparatively small volume.

4. Design criteria and objectives

The following documents were considered with regard to design criteria and water sensitive urban design principles:

- *Shire of Chittering Local Planning Policy No. 16: Roads and Drainage* (LPP 16, Shire of Chittering 2007)
- *Stormwater Management Manual for Western Australia* (DoW 2004-2007); and *Decision Process for Stormwater Management in WA* (DoW 2009), which is a replacement of the chapter of same name within the Stormwater Management Manual
- DoW (2006) *Water Quality Protection Note 52: Stormwater Management at Industrial Sites* (DoW 2006)
- *Muchea Employment Node Structure Plan* (WAPC 2011).

The key criteria relevant to this site are summarised in Table 1.

Table 1: Water management criteria and compliance

Aspect	Guiding document	Criteria	Compliance
Water quality and quantity management (flood management)	<i>LPP 16</i> (Shire of Chittering 2007) <i>Decision Process for Stormwater Management in WA</i> (DoW 2009) <i>Water Quality Protection Note 52</i> (DoW 2006)	<u>Criteria 1</u> : Drainage required as a result of road construction or other development is to be provided by the subdivider and/or developer in accordance with water sensitive design principles, to the satisfaction of Council's CEO as follows: Outside town sites within the Ellen Brook Palusplain – appropriate collection and on-site disposal of stormwater, with drainage designed for one in five year ARI rainfall events.	Yes. Section 5.3.
		<u>Criteria 2</u> : retain/treat the 1yr, 1 hr ARI on-site.	Yes. Section 5.3.
		<u>Criteria 3</u> : Manage run-off from constructed impervious areas for greater than 1yr 1hr ARI events up to 100 yr ARI events in landscaped retention or detention areas [discharge ≤ pre-development peak flows]. Runoff into waterways and wetlands shall be by overland flow paths across vegetated surfaces.	Yes. Section 5.3.
		<u>Criteria 4</u> : Protect the built environment from flooding and waterlogging. Management of seasonal peak groundwater levels through a controlled groundwater level (CGL) to take into consideration the environment.	Yes. Key infrastructure protected from waterlogging (Section 5.2).
		<u>Criteria 5</u> : Controlled release points should be built into any stormwater retention basin to avoid embankment failures under extreme rainfall conditions.	Yes. Section 5.3.2.
Water quality management	<i>Muchea Employment Node Structure Plan</i> (WAPC 2011)	<u>Criteria 6</u> : Treatment in bioretention basin.	Yes. Proposed swales sized and planted to act a bioretention structures (Section 5.3.2, 5.3.3).
Industrial water quality	<i>Water Quality Protection Note 52</i> (DoW 2006)	<u>Criteria 7</u> : If applicable land use, fuel oil and grease removal required prior to release to stormwater system.	Yes. Future refuelling point will have an oil separator (Section 5.3.3).

Lots 802 and 803 Great Northern Highway

Aspect	Guiding document	Criteria	Compliance
		<u>Criteria 8</u> : Chemicals storage and handling in separate containment area.	Yes. Implementation of chemical and fuel management as per Environment Report (Sections 5.3.3).

5. Water management design

5.1 Water servicing

The site is not connected to reticulated potable water or sewerage.

Potable water on the site is sourced from rainwater tanks. Water for toilet flushing and dust suppression is sourced from a licensed groundwater bore located on the site (Licence No. 59401).

Sewerage is collected on the site and removed by a licensed controlled waste removal company.

5.2 Finished levels

Groundwater levels on the unfilled portion of the site are limited by the surface elevation. The SPP is filled to approximately 1 m above the existing surface levels on the north, west and south of the site (Plate 2). Previous topographic surveys indicate that the slope of the SPP matches the slope of the pre-development site, which is approximately 1%. On all sides, a drain has been cut around the SPP into the natural soil. No subsoil drainage is present.

The effect of the change in elevation between the SPP and the surface levels and the presence of the drains is to limit groundwater levels below the SPP. Buildings have been located in the higher parts of the SPP in the north-east. The main office building and demountables being constructed on the site are elevated above the site on risers or concrete blocks. Thus key infrastructure on the site is protected from rising groundwater levels.

5.3 Stormwater management

Future stormwater management of the site has considered the developed (SPP) area of the site. The site has been considered as two separate catchments - one to the east and one to the west of the proposed PDH (Figure 5). The PDH is anticipated to be higher than the current site and will divide the site into two catchments - one east and one west of the highway. Both catchments contain SPP areas, which will require stormwater management measures to comply with the design criteria outlined in Section 4. The area of catchment has been assumed to be the developed SPP area.

5.3.1 Stormwater calculations

Storm and basin analysis was undertaken to assess the volumes required for storage and treatment to meet the design criteria. The assumptions used in modelling are outlined in Table 2. The basin volumes required and results of the modelling are presented in Table 3. Full calculations are presented in Appendix 1.

Table 2: Assumptions

Parameter	Value
Pre-development runoff coefficient	0.9 Site assumed to be waterlogged to surface at start of event
Post-development runoff coefficient for SPP	0.5 for events smaller than 1 in 5 year ARI 0.6 for events larger than 1 in 5 year ARI
Slope of SPP	1%
1 year, 1 hour rainfall (based on BoM Rainfall IFD system, using AR&R parameters)	15.1 mm
Roughness coefficient for sheet flow over SPP	0.2

Table 3: Basin details and results

Catchment	Eastern catchment	Western catchment
Total area (ha)	11.41 ha	11.70 ha
1 year ARI (1 hour) - for treatment and retention (Criteria 2, 3)		
Storage volume required	861 m ³	883 m ³
Equivalent swale length - 1 m deep, 1 m wide swale with 1 in 3 sides (total width 7 m)	215 m	221 m
Equivalent swale length - 1 m deep, 4 m wide swale with 1 in 3 sides (total width 10 m)	123 m	126 m
5 year ARI - for trafficability criteria (Criteria 1)		
Time of concentration	17 min	16 min
Discharge rate (overland flow)	0.30 m ³ /s	0.32 m ³ /s
Depth of discharge	2.7 mm	1.8 mm
D x W	0.001 m ² /s Meets AR&R trafficability requirements - trafficability maintained	0.001 m ² /s Meets AR&R trafficability requirements - trafficability maintained
100 year ARI - for maintaining pre-development flows (Criteria 3)		
Pre-development maximum flow rate	0.79 m ³ /s	0.81 m ³ /s
Post-development time of concentration	6 min	6 min
Storage volume required	353 m ³ Less than 1 in 1 year, 1 hour volume	350 m ³ Less than 1 in 1 year, 1 hour volume

The key design requirement for the storages is the ability to retain and treat the 1 in 1 year, 1 hour event. This requires storage of 861 m³ in the Eastern Catchment and 603 m³ in the western catchment (Table 3). These storages will require outlets to the stormwater drains for discharge purposes to prevent erosion.

5.3.2 Proposed stormwater structures

The SMP previously prepared for the site proposed the excavation within the natural soil of a 1 m deep swale around the perimeter of the SPP, graded at the same grade as the site (Figure 3). The proposed swale has a potential width of 4 m (AMS 2015). Excavation of a swale to 1 m depth in a high groundwater table area will result in the swale filling with groundwater, resulting in little or no volume being available above the groundwater surface in the swale for detention of flows.

To avoid this, additional stormwater storage structures should be constructed within the SPP with the base of the storage basin or swale above the base of the fill. The storage will require a spillway to allow water to discharge to the existing drains. The spillway should be stabilised with rip rap (large stones) to prevent erosion. A separate low flow outlet should be installed near the base of the spillway to allow for low flows to exit the storage.

Discharge from the Western Catchment should be located to allow discharged stormwater to flow into Ellen Brook via the existing drains to prevent erosion.

Discharge point for the Eastern Catchment should be identified in consultation with MRWA, as the discharge will need to connect to the proposed culverts under PDH. The timing of swale construction is consequently subject to the timing of MRWA construction of PDH.

5.3.3 Water quality management

Basin vegetation

The SMP recommends vegetating of the swales but a species list is not proposed. Species for water treatment in swales should be selected from those recommended by *Vegetation Guidelines for Stormwater Biofilters in the South-West of Western Australia* (Monash University 2014). Recommended species are:

- *Carex appressa* (tall sedge)
- *Juncus subsecundus* (finger rush)
- *Juncus kraussii* (sea rush)
- *Baumea juncea* (bare twig sedge).

Chemical and fuel management

Fuel and chemicals are key contaminants on the Site. The Environmental Report (Strategen 2016, Appendix 2) site addresses management of fuels and chemicals in detail. Key management measures include:

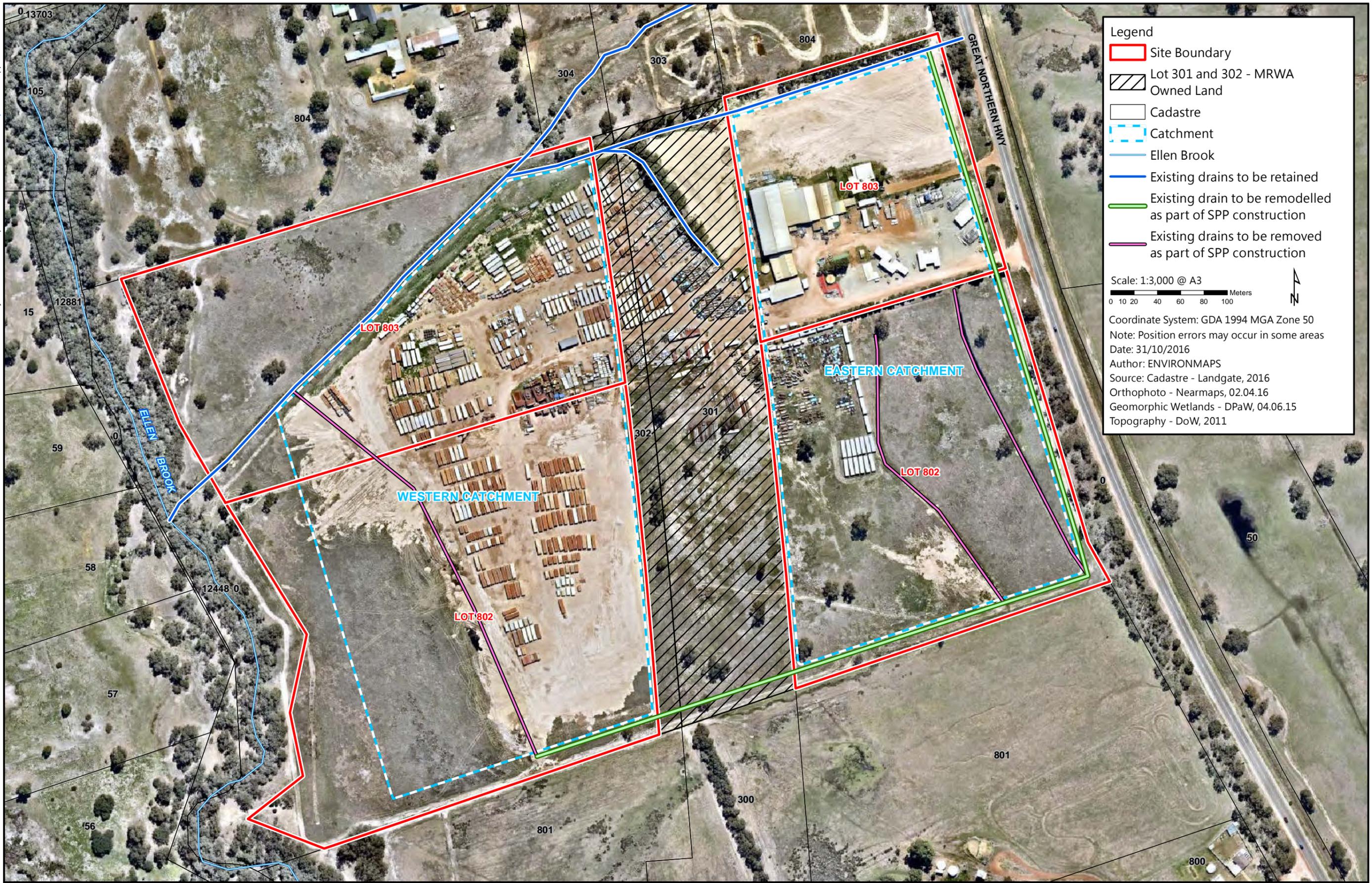
- storage of chemicals in designated areas within buildings
- inspection of vehicles and machinery prior to entry to the site to ensure these are not leaking
- inspection of vehicle storage areas on a monthly basis to identify any spills and leaks early in the process
- implementing spill management procedures (Strategen 2016).

Karratha Enterprises wishes to locate a fuel storage and refuelling point on the site in future following the resumption of the central area by MRWA. This relocation would be the subject of a Development Application. If not properly managed, fuel storages and refuelling areas may be a source of groundwater and surface water pollution. Any future fuel storages and refuelling points on the site shall be:

- located on a properly sealed and bunded hardstand area, preferably concrete or bitumen
- have a stormwater system which drains to an appropriate oil separator, which allows hydrocarbons to be removed from stormwater prior to discharge to the broader stormwater system.

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Lots 802 and 803 Great Northern Highway
Catchment Plan

Figure
5

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6. Stormwater operational management

This section addresses the maintenance and management required to ensure that stormwater quality is maintained and to reduce the risk of flooding. Management of waste and fuel and chemicals, which affect stormwater quality, are included in the Environmental Report (Appendix 2).

6.1 Environmental objectives, targets and key performance indicators

Environmental objectives, targets and key performance indicators for the management of waste are detailed in Table 4.

Table 4: Environmental objectives, targets and key performance indicators for stormwater

Objective	Target	Key performance indicator
Minimise the risk of flooding on the site	Avoid flooding of critical assets including buildings	No flooding of critical assets including buildings.
Minimise stormwater pollution from the site	Prevent pollution of surface waters	Water monitoring indicates that downstream surface water quality is the same or better than upstream quality.

6.2 Management actions

Management actions for stormwater are detailed in Table 5.

Table 5: Management actions for stormwater

Item	Action	Timing	Responsibility
Induction	All staff shall be inducted in relation to appropriate waste management and fuel storage procedures to prevent stormwater contamination.	At commencement	Site manager
Swales	Swales shall be constructed and planted with appropriate species.	Within 12 months of completion of construction of the SPP and PDH, with planting to occur between May to July	Site manager
	Swales shall be maintained in a serviceable condition, including removal of blockages and sediment build up.	Within one week of blockages/ build up being identified	Site manager

6.3 Monitoring and reporting

Monitoring and reporting requirements for stormwater are detailed in Table 6.

Table 6: Stormwater monitoring and reporting requirements

Parameter	Purpose	Location	Frequency	Timing	Parameter	Responsibility
Ponding and flooding	To assess effectiveness of drainage system	Site	Opportunistically	After heavy rains	Presence of excessive ponding or flooding	Site manager
Swales	To ensure drainage system is operating effectively	Swales	Quarterly Opportunistically	June, September, December and March and following heavy rain	Dead plants, weeds, blockages and build up of sediment	Site manager
Water quality	To assess effectiveness of water quality management measures	At Great Northern Highway culvert (upstream) and discharge to Ellen Brook (downstream)	Twice per year	June and December	pH, EC, total dissolved salts, total suspended solids, total nitrogen, total phosphorus, total petroleum hydrocarbons, heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)	Site manager

6.4 Contingency measures

Contingency measures for the management of stormwater are detailed in Table 7.

Table 7: Contingency measures for stormwater

Trigger	Contingency actions	Responsibility
Excessive ponding and flooding	<ol style="list-style-type: none"> 1. Review design and operation of stormwater drainage system. 2. Consider modification of drainage system and/or review levels if required. 	Site manager
Weeds, blockages and/or build up of sediment in swales	<ol style="list-style-type: none"> 1. Remove weeds, blockages and build up within one week of being identified. 2. If blockages or build up are an ongoing concern, identify the reasons and how this can be managed. 	Site manager
Dead plants in swale	<ol style="list-style-type: none"> 1. Replace dead plants during the following planting season (May to July). 2. If a particular species is causing concern, consider replacement with similar species. 	Site manager
Downstream surface water quality significantly poorer than upstream quality in two consecutive events.	<ol style="list-style-type: none"> 1. Review operational and maintenance measures. 2. Ensure site workers are aware of requirements for management of fuel, chemicals and waste. 3. If problem is ongoing, consider modifications to stormwater system. 	Site manager

7. References

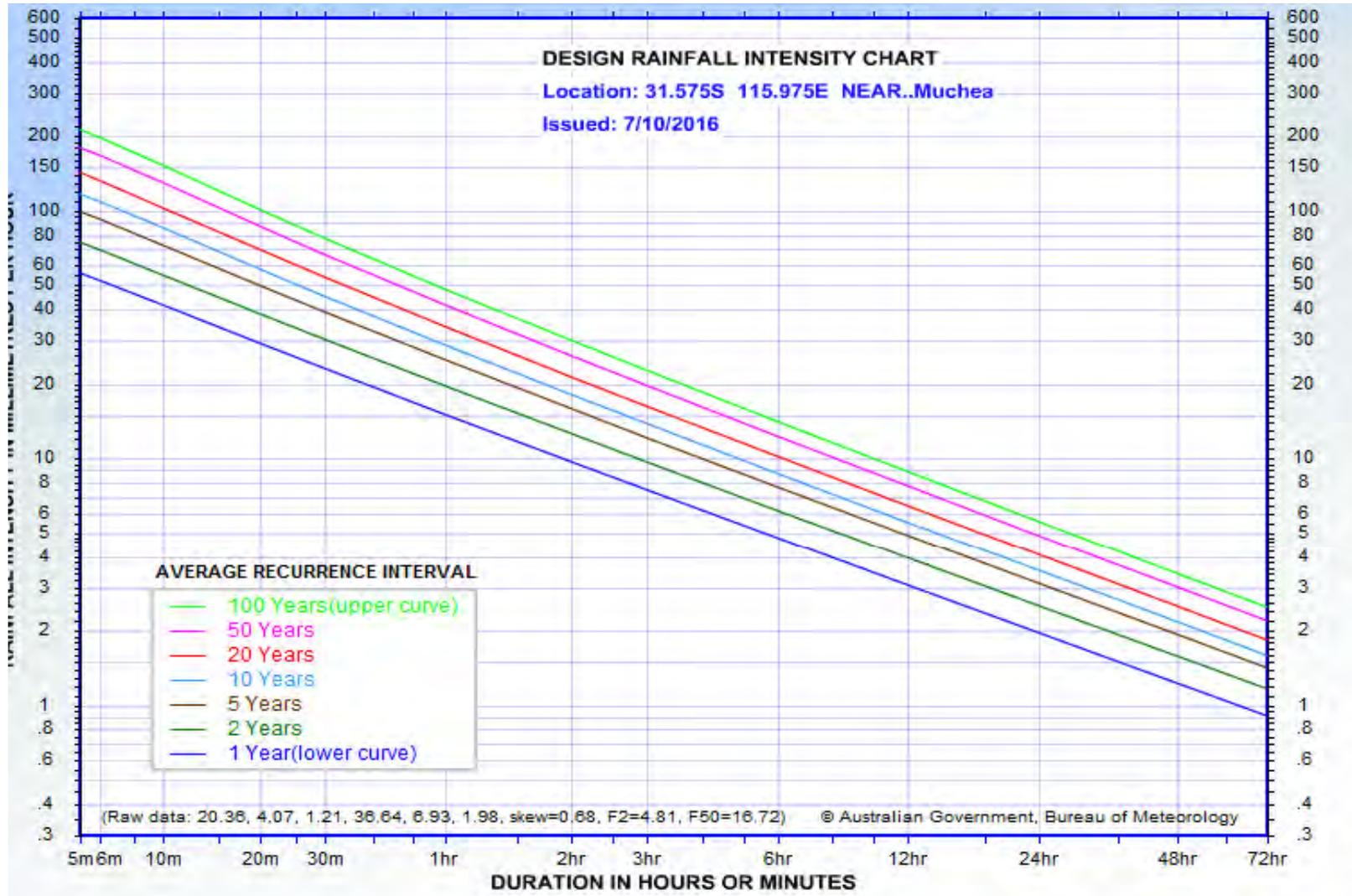
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**Appendix 1
Stormwater calculations**

RAINFALL AND RUNOFF

IFD info from BoM

DURATION	1 Year	2 years	5 years	10 years	20 years	50 years	100 years
5Mins	56.1	74.6	99.3	117	143	180	213
6Mins	52.3	69.4	92.4	109	132	167	197
10Mins	41.8	55.2	72.9	85.7	103	130	153
20Mins	29.1	38.3	49.8	58	69.4	86.3	101
30Mins	23.1	30.3	39	45.1	53.8	66.5	77.3
1Hr	15.1	19.7	25.1	28.8	34.1	41.8	48.3
2Hrs	9.71	12.6	15.9	18.1	21.3	26	30
3Hrs	7.46	9.67	12.1	13.8	16.2	19.7	22.7
6Hrs	4.77	6.15	7.67	8.71	10.2	12.3	14.1
12Hrs	3.06	3.94	4.88	5.52	6.44	7.76	8.87
24Hrs	1.96	2.52	3.1	3.5	4.07	4.87	5.56
48Hrs	1.23	1.58	1.93	2.17	2.51	3	3.4
72Hrs	0.91	1.17	1.42	1.59	1.84	2.2	2.49



1 IN 1 YEAR, 1 HOUR EVENT FOR STORAGE

Eastern catchment	114100 m2
Total hardstand	231100 m2
Western catchment	117000 m2
total lot area	295410 m2

RUNOFF FROM TOTAL IMPERVIOUS AREA

Runoff coefficient impervious area	0.5	Bare ground, minor event
------------------------------------	-----	--------------------------

Eastern catchment

Impervious area (km2)	114100 m2	
1 yr, 1 hr event runoff	861 m3	
Swale storage length required	123 m	with 4 m wide base, total width is 10 m
	215 m	with 1 m wide base, total width is 7m

Western catchment

Impervious area (km2)	117000 m2	
1 yr, 1 hr event runoff	883 m3	
Swale storage length required	126 m	with 4 m wide base, total width is 10 m
	221 m	with 1 m wide base, total width is 7m

Table 2.5: Recommended Runoff Coefficients for Various Landuses
(DID, 1980; Chow et al., 1988; QUDM, 2007 and Darwin Harbour, 2009)

Landuse	Runoff Coefficient (C)	
	For Minor System (≤10 year ARI)	For Major System (> 10 year ARI)
Residential		
Bungalow	0.65	0.70
Semi-detached Bungalow	0.70	0.75
Link and Terrace House	0.80	0.90
Flat and Apartment	0.80	0.85
Condominium	0.75	0.80
Commercial and Business Centres	0.90	0.95
Industrial	0.90	0.95
Sport Fields, Park and Agriculture	0.30	0.40
Open Spaces		
Bare Soil (No Cover)	0.50	0.60
Grass Cover	0.40	0.50
Bush Cover	0.35	0.45
Forest Cover	0.30	0.40
Roads and Highways	0.95	0.95
Water Body (Pond)		
Detention Pond (with outlet)	0.95	0.95
Retention Pond (no outlet)	0.00	0.00

Note: The runoff coefficients in this table are given as a guide for designers. The near-field runoff coefficient for any single or mixed landuse should be determined based on the imperviousness of the area.

1 IN 100 YEAR EVENT FOR STORAGE

Time of concentration

Pasture scenario

Tc = Tc sheet flow + Tc channel

Tc overland

$$t_c = \frac{0.938L^{0.6}n^{0.6}}{i^{0.4}S^{0.3}}$$

where:

Tc = travel time (min),

n = Manning's roughness coefficient – see table below

L = flow length (m)

i = rainfall intensity (in/hr) – you need to select an initial T to get the critical storm/rainfall intensity, then iterate

s = slope of hydraulic grade line(land slope, m/m)

The sheet flow length 'L' is defined as follows

$$L = \frac{100\sqrt{S}}{n}$$

Based on S of 0.01 and n of 0.2 (short/dense grasses – see below) the sheet flow distance 'L' is about 50m so use this in the kinematic flow equation.

Beyond this distance the depth of flow is about 0.1-0.5 feet (3-15cm) and sheet flow ends.

Eastern Catchment

Pre development Q100

Total flow length 260 m Direction at 90 degrees to flow

Sheet flow length

L = 50 m 50 m 164 ft

S 0.01

n 0.2

i 122 mm/hr 4.8068 in/hr 16 min duration

tc = 16.18023 min

Iteration	tc	i	tc - calc
1	6	197	13
2	13	135	15
3	15	125	16
4	16	122	16

IFD info from BoM

DURATION	1 Year	2 years	5 years	10 years	20 years	50 years	100 years
5Mins	56.1	74.6	99.3	117	143	180	213
6Mins	52.3	69.4	92.4	109	132	167	197
10Mins	41.8	55.2	72.9	85.7	103	130	153
20Mins	29.1	38.3	49.8	58	69.4	86.3	101
30Mins	23.1	30.3	39	45.1	53.8	66.5	77.3
1Hr	15.1	19.7	25.1	28.8	34.1	41.8	48.3
2Hrs	9.71	12.6	15.9	18.1	21.3	26	30
3Hrs	7.46	9.67	12.1	13.8	16.2	19.7	22.7
6Hrs	4.77	6.15	7.67	8.71	10.2	12.3	14.1
12Hrs	3.06	3.94	4.88	5.52	6.44	7.76	8.87
24Hrs	1.96	2.52	3.1	3.5	4.07	4.87	5.56
48Hrs	1.23	1.58	1.93	2.17	2.51	3	3.4
72Hrs	0.91	1.17	1.42	1.59	1.84	2.2	2.49

Shallow concentrated flow

L	210 m	688.8 ft	
S	0.01		
Assume short grassed pasture in figure below			
v	0.7 ft/s	0.21336 m/s	
tc shallow = L/v			
tc shallow	984 seconds	16 minutes	
tc total	31 minutes		tc shallow plus tc sheet
i	77 mm/hr		

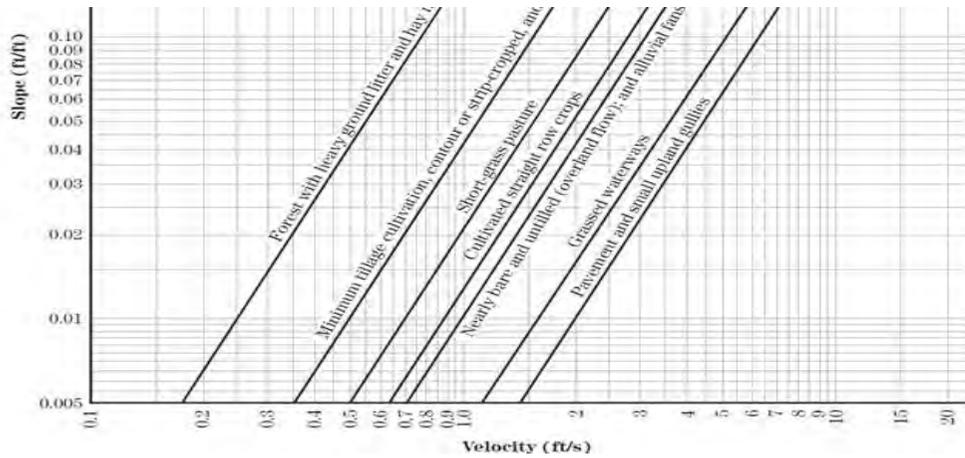
Calculate Q100 by rational method

Q=CIA

C 0.9 Waterlogged paddock

A 11.41 ha

Q100 0.791 m3/s



<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=27002.wba>

Post development Q100

Sheet flow length

L 260 m 852.8 ft
 S 0.01
 n 0.011
 i 197 mm/hr 7.7618 in/hr 6 min duration
 tc = 6.30321 min

Iteration	tc	i	tc - calc
1	12	140	7
2	7	190	6
3	6	197	6

Calculate Q100 by rational method

Q=CIA

C 0.6 Bare soil, major event as below

A 11.41 ha

Q100 1.349 m3/s

Total rainfall 2248 m3

Total runoff 1349 m3

<http://msmaware.com/blog/documentation/rational-method/rational-method-computation-method-in-msma-2011/theory/runoff-coefficients/>

Table 2.5: Recommended Runoff Coefficients for Various Landuses (DID, 1980; Chow et al., 1988; QUDM, 2007 and Darwin Harbour, 2009)

Landuse	Runoff Coefficient (C)	
	For Minor System (≤10 year ARI)	For Major System (> 10 year ARI)
Residential		
Bungalow	0.65	0.70
Semi-detached Bungalow	0.70	0.75
Link and Terrace House	0.80	0.90
Flat and Apartment	0.80	0.85
Condominium	0.75	0.80
Commercial and Business Centres	0.90	0.95
Industrial	0.90	0.95
Sport Fields, Park and Agriculture	0.30	0.40
Open Spaces		
Bare Soil (No Cover)	0.50	0.60
Grass Cover	0.40	0.50
Bush Cover	0.35	0.45
Forest Cover	0.30	0.40
Roads and Highways	0.95	0.95
Water Body (Pond)		
Detention Pond (with outlet)	0.95	0.95
Retention Pond (no outlet)	0.00	0.00

Note: The runoff coefficients in this table are given as a guide for designers. The near-field runoff coefficient for any single or mixed landuse should be determined based on the imperviousness of the area.

Preliminary basin sizing

Qi	1.349 m3/s	Inflow rate
Qo	0.791 m3/s	Desired outflow rate = pre-development Q100

$$r = \frac{(Q_i - Q_o)}{Q_i}$$

r	0.413706	Reduction ratio
---	----------	-----------------

r between 0.25 and 0.45, therefore use Basha method (Scraggs and Lemckert, 2004)

$$\frac{V_s}{V_i} = \frac{r(3 + 5r)}{8}$$

Vi	1349 m3	Inflow volume
Vs	353 m3	From above
Swale length	50 m	with 4 m wide base
	88 m	with 1 m wide base

Western catchment

Pre development Q100

Total flow length	280 m		
Sheet flow length			
L = 50 m	50 m	164 ft	
S	0.01		
n	0.2		
i	122 mm/hr	4.8068 in/hr	16 min duration

tc = 16.18023 min

Iteration	tc	i	tc - calc	
	1	6	197	7
	2	15	125	16
	3	16	122	16

Shallow concentrated flow

L	230 m	754.4 ft	
S	0.01		
Assume short grassed pasture in figure below			
v	0.7 ft/s	0.21336 m/s	
tc shallow = L/v			
tc shallow	1078 seconds	18 minutes	
tc total	34 minutes		tc shallow plus tc sheet
i	77 mm/hr		

Calculate Q100 by rational method

Q=CiA		
C	0.9	Waterlogged paddock
A	11.7 ha	
Q100	0.811 m3/s	

Post development Q100

Sheet flow length

L	280 m	918.4 ft	
S	0.01		
n	0.011		
i	197 mm/hr	7.7618 in/hr	6 min duration

tc = 6.589805 min

Iteration	tc	i	tc - calc
	1	9	160
	2	7	190
	3	6	197

Calculate Q100 by rational method

Q=CiA		
C	0.6	Bare soil, major event as below
A	11.7 ha	
Q100	1.383 m3/s	
Total rainfall	2223 m3	
Total runoff	1334 m3	

<http://msmaware.com/blog/documentation/rational-method/rational-method-computation-method-in-msma-2011/theory/runoff-coefficients/>

Table 2.5: Recommended Runoff Coefficients for Various Landuses
(DID, 1980; Chow et al., 1988; QUDM, 2007 and Darwin Harbour, 2009)

Landuse	Runoff Coefficient (C)	
	For Minor System (≤10 year ARI)	For Major System (> 10 year ARI)
Residential		
Bungalow	0.65	0.70
Semi-detached Bungalow	0.70	0.75
Link and Terrace House	0.80	0.90
Flat and Apartment	0.80	0.85
Condominium	0.75	0.80
Commercial and Business Centres	0.90	0.95
Industrial	0.90	0.95
Sport Fields, Park and Agriculture	0.30	0.40
Open Spaces		
Bare Soil (No Cover)	0.50	0.60
Grass Cover	0.40	0.50
Bush Cover	0.35	0.45
Forest Cover	0.30	0.40
Roads and Highways	0.95	0.95
Water Body (Pond)		
Detention Pond (with outlet)	0.95	0.95
Retention Pond (no outlet)	0.00	0.00

Note: The runoff coefficients in this table are given as a guide for designers. The near-field runoff coefficient for any single or mixed landuse should be determined based on the imperviousness of the area.

Preliminary basin sizing

Qi 1.383 m³/s
Qo 0.811 m³/s

Inflow rate
Desired outflow rate = pre-development Q100

$$r = \frac{(Q_i - Q_o)}{Q_i}$$

r 0.413706 Reduction ratio

r between 0.25 and 0.45, therefore use Basha method (Scraggs and Lemckert, 2004)

$$\frac{V_s}{V_i} = \frac{r(3+5r)}{8}$$

Vi	1334 m ³	Inflow volume
Vs	350 m ³	From above
Channel storage	50 m	with 4 m wide base
	87 m	with 1 m wide base

1 IN 5 YEAR EVENT FOR SERVICABILITY**Time of concentration****Pasture scenario**

Tc = Tc sheet flow + Tc channel

Tc overland

$$t_c = \frac{0.938L^{0.6}n^{0.6}}{i^{0.4}S^{0.3}}$$

where:

Tc = travel time (min),

n = Manning's roughness coefficient – see table below

L = flow length (m)

i = rainfall intensity (in/hr) – you need to select an initial T to get the critical storm/rainfall intensity, then iterate

s = slope of hydraulic grade line(land slope, m/m)

Eastern catchment**Post development Q5****Sheet flow length**

L	260 m	852.8 ft	
S	0.01		
n	0.011		
i	52 mm/hr	2.0488 in/hr	17 min duration
tc	=	10.73858 min	

Iteration	tc	i	tc - calc
1	20	49.8	17
2	17	52	17

Calculate Q5 by rational method

Q=CiA

C 0.5 Bare soil, minor event as below

A 11.41 ha

Q5 0.297 m3/s

D = Q / (V x w)

Velocity 0.255 m/s

Width of discharge 438.846 m

Depth of discharge 2.7 mm

D x W 0.001 m2/s - so well below the cutoff in ARR for trafficability

<http://msmaware.com/blog/documentation/rational-method/rational-method-computation-method-in-msma-2011/theory/runoff-coefficients/>

Table 2.5: Recommended Runoff Coefficients for Various Landuses
(DID, 1980; Chow et al., 1988; QUDM, 2007 and Darwin Harbour, 2009)

Landuse	Runoff Coefficient (C)	
	For Minor System (≤10 year ARI)	For Major System (> 10 year ARI)
Residential		
Bungalow	0.65	0.70
Semi-detached Bungalow	0.70	0.75
Link and Terrace House	0.80	0.90
Flat and Apartment	0.80	0.85
Condominium	0.75	0.80
Commercial and Business Centres	0.90	0.95
Industrial	0.90	0.95
Sport Fields, Park and Agriculture	0.30	0.40
Open Spaces		
Bare Soil (No Cover)	0.50	0.60
Grass Cover	0.40	0.50
Bush Cover	0.35	0.45
Forest Cover	0.30	0.40
Roads and Highways	0.95	0.95
Water Body (Pond)		
Detention Pond (with outlet)	0.95	0.95
Retention Pond (no outlet)	0.00	0.00

Note: The runoff coefficients in this table are given as a guide for designers. The near-field runoff coefficient for any single or mixed landuse should be determined based on the imperviousness of the area.

Western catchment Post development Q5

Sheet flow length

L	280 m	918.4 ft	
S	0.01		
n	0.011		
i	60 mm/hr	2.364 in/hr	14 min duration

$$t_c = 10.60226 \text{ min}$$

Iteration	t_c	i	t_c - calc
1	17	52	14
2	11	56	11

Calculate Q5 by rational method

$$Q = CiA$$

C 0.5 Bare soil, minor event as below

A 11.7 ha

Q5 0.328 m³/s

$$D = Q / (V \times w)$$

Velocity 0.424 m/s

Width of discharge 417.857 m

Depth of discharge 1.8 mm

D x W 0.001 m²/s - so well below the cutoff in ARR for trafficability

<http://msmaware.com/blog/documentation/rational-method/rational-method-computation-method-in-msma-2011/theory/runoff-coefficients/>

**Appendix 2
Environmental report**



intelligent outcomes | respected experience

Lots 802 and 803 Great Northern Highway

Environmental Report

Prepared for
Planning Solutions
by Strategen

February 2017

Lots 802 and 803 Great Northern Highway

Environmental Report

Strategen is a trading name of
Strategen Environmental Consultants Pty Ltd
Level 1, 50 Subiaco Square Road Subiaco WA 6008
ACN: 056 190 419

February 2017

Limitations

Scope of services

This report ("the report") has been prepared by Strategen Environmental Consultants Pty Ltd (Strategen) in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen has also not attempted to determine whether any material matter has been omitted from the data. Strategen will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen. The making of any assumption does not imply that Strategen has made any enquiry to verify the correctness of that assumption.

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Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

Client: Planning Solutions

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Preliminary Draft Report	A	Client review	M Dunlop/ D Newsome	Electronic	13/10/16
Draft Report	B	Client review	M Dunlop/ D Newsome	Electronic	1/11/16
Final Draft Report	C	Client review	M Dunlop/ D Newsome	Electronic	11/11/16
Revised Final Draft Report	D	Client review	M Dunlop/ D Newsome	Electronic	17/1/17
Revised Final Draft Report	E	Client review	M Dunlop/ D Newsome	Electronic	20/1/17
Final Report	0	Agency Submission	M Dunlop/ D Newsome	Electronic	10/2/17

Filename: PSO16487_01 R001 Rev 0 - 10 February 2017

Table of contents

1. Introduction	1
1.1 Background	1
1.2 Scope	1
1.3 Report structure	1
2. Legislative context	1
3. Activities undertaken on the site	5
3.1 Approved construction works	5
3.2 Demountable building construction and storage	6
3.3 Skip bin storage and refurbishment	6
3.4 Vehicle and machinery storage	9
4. Existing environment	10
4.1 Topography	10
4.2 Soils	10
4.3 Groundwater and surface water	10
4.4 Flora and fauna	11
5. Environmental management	15
5.1 Fuel and chemical management	15
5.1.1 Environmental objectives, targets and key performance indicators	15
5.1.2 Management actions	15
5.1.3 Monitoring and reporting	16
5.1.4 Contingency measures	16
5.2 Waste management	17
5.2.1 Background	17
5.2.2 Environmental objectives, targets and key performance indicators	17
5.2.3 Management actions	17
5.2.4 Monitoring and reporting	18
5.2.5 Contingency measures	18
6. Summary and conclusions	19
7. References	20

List of tables

Table 1: Environmental objectives, targets and key performance indicators	15
Table 2: Fuel and chemical storage and emergency response management actions	15
Table 3: Monitoring and reporting requirements for fuel and chemical storage and emergency response	16
Table 4: Contingency measures for fuel and chemical storage and emergency response	17
Table 5: Environmental objectives, targets and key performance indicators for waste	17
Table 6: Management actions for waste	18
Table 7: Waste monitoring and reporting requirements	18
Table 8: Contingency measures for waste	18

List of figures

Figure 1: Site layout	3
Figure 2: Approved works	7
Figure 3: Soils and topography	13
Figure 4: Surface water	14

List of plates

Plate 1: Semi-pervious pavement	5
Plate 2: New SPP area adjacent to drain on the southern boundary of the site.	6
Plate 3: Vehicle and machinery storage	9

1. Introduction

1.1 Background

Karratha Enterprises wish to seek retrospective development approval for additional storage activities taking place (specifically mining equipment/vehicles and skip bins) at Lots 802 and 803 Great Northern Highway, Muchea (the site). The site is located approximately 40km north-north-east of Perth in the Shire of Chittering (Shire) and has total area is 29.543 ha.

The site is approved for the manufacture of sheds, kit homes and other transportable buildings (and associated/incidental transport and freight operations, temporary storage and open air display of products/materials).

The lots abut Ellen Brook Foreshore Reserve to the west (Figure 1). The proposed Perth-Darwin Highway is located in the centre of the Site, and this land is held by Main Roads WA (Figure 1).

1.2 Scope

The scope of the work was to the suitability of land uses occurring on site and subject to retrospective planning approval, and any appropriate environmental management measures required. A separate water management strategy has been prepared for the site.

1.3 Report structure

The report has been structured to include:

- legislative context (Section 2)
- description of the approved works and activities currently undertaken on the site (Section 3)
- discussion of the existing environment and the suitability of the site for the activities currently undertaken on the site (Section 4)
- environmental management measures for activities that may potentially pose an environmental risk (Section 5)
- summary and conclusions (Section 6).

2. Legislative context

The desktop and environmental field survey has been conducted with reference to the following Australian and Western Australian legislation:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – Australian Government
- *Wildlife Conservation Act 1950* (WC Act) – State
- *Environmental Protection Act 1986* (EP Act) – State
- *Biosecurity and Agriculture Management Act 2007* (BAM Act) – State
- *Contaminated Sites Act 2003* (CS Act) -State
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) - Federal.

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Lots 802 and 803 Great Northern Highway
Site Layout

Figure
1

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3. Activities undertaken on the site

This section provides a summary of the activities undertaken on the site and the potential environmental risks posed by these activities.

3.1 Approved construction works

Portions of the Site that contain buildings and/or are currently used for vehicle and demountable storage have been filled and raised to a level above the remainder of the Site, as approved by the Shire. Karratha Enterprises are currently converting areas of the site to hardstand as approved by the Shire (AMS 2015, Figure 2). The 'hardstand' consists of compacted sand covered by engineered fill and resembles a compacted gravel road (Plate 1).



Plate 1: Semi-pervious pavement

Based on the site inspection and information provided in the Stormwater Management Plan (AMS 2015) the material is considered to be a semi-permeable pavement (SPP). The SPP is constructed of a layer of 0.3 to 1.2 m of sand overlain with minimum of 0.3 m of engineered fill with greater than 80% of particles having a size of between 0.1 and 1 mm (AMS 2015), equivalent to a fine to medium grained sand. Plate 2 shows the edge of the new SPP and the separation from the pre-development levels. The engineered fill is compacted with a roller. The material has been sourced from an approved recycling facility and passes appropriate health and environmental standards for use in commercial and industrial areas (AMS 2015).



Plate 2: New SPP area adjacent to drain on the southern boundary of the site.

Ponding was noted in areas of SPP, despite the lack of rain in the two days prior to the site inspection (Plate 1). There was no evidence of drainage pathways or erosion from the new SPP, indicating the material is relatively permeable.

3.2 Demountable building construction and storage

Because of the size of the transportable buildings, construction of demountable buildings occurs largely outdoors. The construction process involves welding of material to construct frames and the use of pre-fabricated materials such as bonded steel, marine ply wood and expanded foam. This limits the requirement for the use of chemicals such as paints and glues in construction. Small volumes of paints and glues are stored on the site for use in transportable construction.

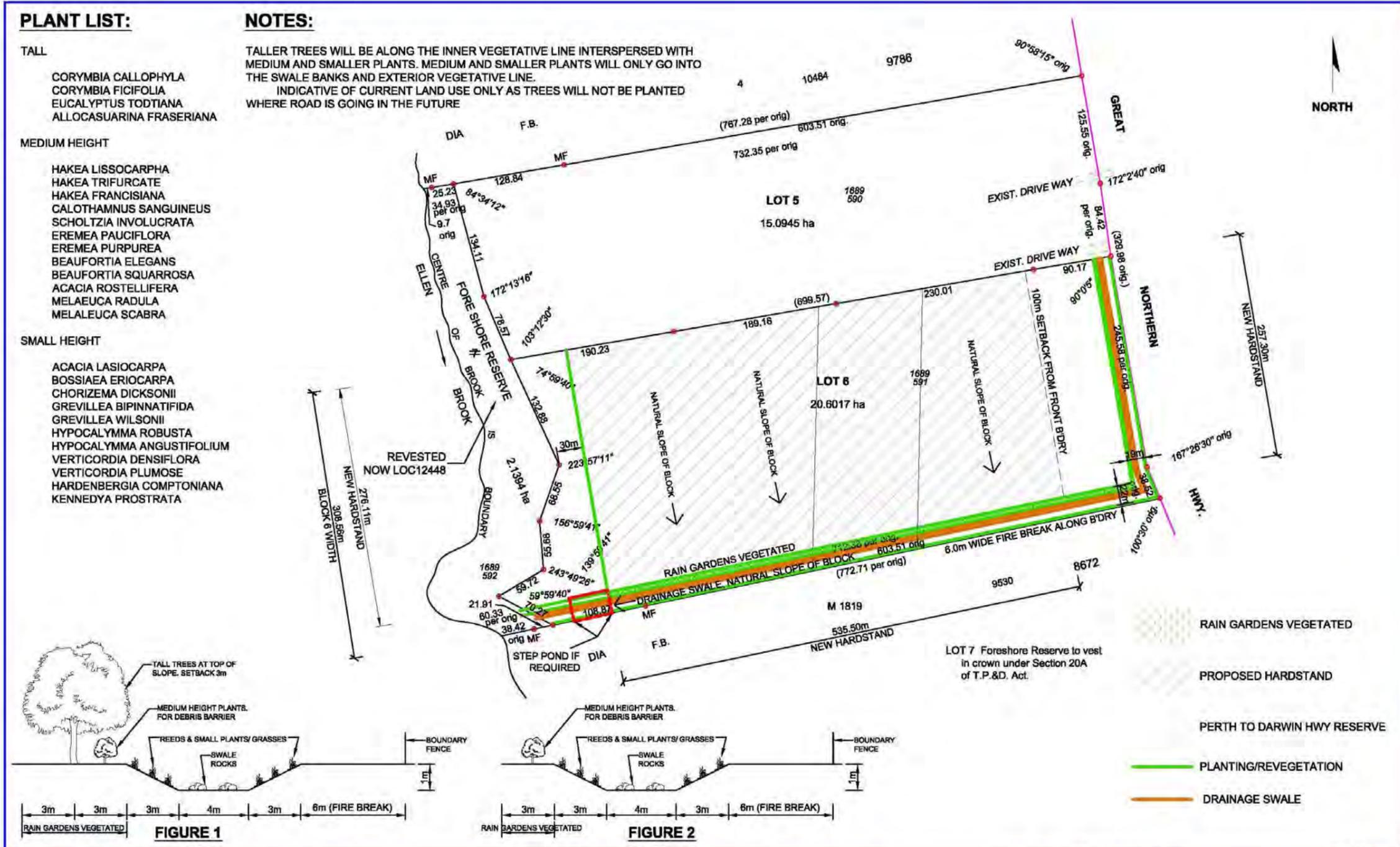
Empty demountables are also stored on the property. Empty demountables are not considered to pose a potential risk to the environment.

The risks to the environment and waterways associated with demountable construction and storage are considered to be low. To minimise environmental risks, chemicals and waste materials from demountable construction should be managed as described in Section 5.

3.3 Skip bin storage and refurbishment

Skip bins are bought to the site for storage and stored on a SPP area. Skip bins are cleaned prior to entering the site.

Where skip bins are found to be damaged, these are repaired within the existing approved workshop. Skip bin repairs are undertaken in a building already fitted out and being used for similar activities, including metal structure fabrication of demountable buildings.



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Rev	VO Number and Description	DRN	DATE	CHK
0	ISSUED FOR REVIEW	LV	18/03/15	NC
1	ISSUED FOR SHIRE SUBMISSION	LV	10/09/15	NC
2	RE-ISSUED FOR SHIRE SUBMISSION	LV	25/09/15	NC
3	RE-ISSUED FOR SHIRE SUBMISSION	LV	18/11/15	TB

Model	SITE PLAN	Date Drawn	18/03/15
Job No		Revision N°	3
SCALE: 1:4000 @ A3		Sheet N°	1 of 1
Sub-Contractors to verify all dimensions on site			
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Figure 2: Approved works

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Repairs are conducted in an undercover area, the risks to the environment and waterways associated with the refurbishment are considered to be low.

3.4 Vehicle and machinery storage

Mining vehicles and associated machinery are stored on site on behalf of Downer, who rent a portion of the site (Plate 3). The machinery is stored on SPP areas. Plant and equipment are cleaned before entering site to prevent contaminants, including weed seeds and hydrocarbons, entering the site.



Plate 3: Vehicle and machinery storage

Downer has prepared their own environmental management plan (EMP) for the storage (Downer, undated) which includes spill management procedures. Downer undertakes environmental inspections on a minimum of quarterly (typically monthly) basis. All non-conformances, corrective actions and opportunities for improvements that are identified through inspections and audits are recorded and managed through Downer's internal audit process.

No evidence of leakage of fuels or hydrocarbons from the vehicles was noted during the site inspection. Karratha Enterprises advises that vehicles are drained of fuel prior to entering the site (Carrington N [Karratha Enterprises] 2016, pers. comm. 30 September).

The storage of vehicles and machinery on the Site has the potential to result in leaks of fuel and other hydrocarbons such as oil and grease. Given the permeability of the SPP, spilled or leaked hydrocarbons may be absorbed into the soil and enter groundwater. As the vehicles and machinery are not used on the site, the main source of hydrocarbons is likely to be leaks, which are likely to be slow and of comparatively small volume.

Management measures for spills and leaks from vehicles on the site are discussed in Section 5.1.

4. Existing environment

4.1 Topography

The 2011 LIDAR is the most recent topography available for the whole site, and indicates the site varies from approximately 53 mAHD in the east of the Great Northern Highway to 44 mAHD in the west adjacent to Ellen Brook. Earthworks have been undertaken on the site since 2011 to raise the site and were ongoing at the time of writing, in accordance with previous development approvals issued by the Shire.

Environmental suitability for land use

With the addition of fill as described in Section 3.1 as approved by the Shire, the site topography is not considered to pose an environmental constraint to the use of the site for the current purposes. Low-lying land is commonly developed for Light Industrial purposes, as occurs in the Hazelmere and Kwinana areas.

4.2 Soils

Site geology is mapped by Gozzard (1982) as:

- Sand - light grey, medium grained, sub-angular to rounded quartz and feldspar, moderately sorted, in the vicinity of Ellen Brook
- Pebbly Silt (Guildford Formation) - strong brown silt with common fine to occasionally coarse grained, sub rounded laterite, quartz, heavily weathered granite pebbles, some fine to medium grained quartz sand of alluvial origin (Figure 1).

Strategen undertook a site inspection on 30 September 2016. The soils in the undeveloped parts of the site appeared to be variable, including fine clayey sands, sandy clays and peaty sand materials.

The site is mapped as having low to no risk of Acid Sulphate Soils (ASS) over most of the Site. The area adjacent to Ellen Brook is mapped as having a moderate to low risk of ASS occurring within 3 m of the natural surface.

Environmental suitability for land use

Soils and geology are not considered to pose an environmental constraint to the use of the site for the current purposes. The soil properties of the site are not considered to be negatively affected by use for the current purposes.

4.3 Groundwater and surface water

The majority of the site is mapped by Department of Parks and Wildlife as part of a multiple use palusplain or seasonally waterlogged flat (Figure 4). At the time of site inspection on 30 September 2016, portions of the Site that had not been filled were predominantly waterlogged, with water at or close to the surface.

The site contains a large drain which runs in an approximately east-west direction across the Site, before heading south-west towards Ellen Brook. A number of smaller drains are also present along the edge of the road. Where new areas of SPP are to be constructed the south of the site, drains within the SPP area are being relocated to the edge of the SPP area to ensure continuation of flow paths.

The site owner advised that the site receives drainage from areas to the east, including Great Northern Highway. The site has been subject to areas of ponding during winter and storm events (AMS 2015).

At the time of inspection by Strategen on 30 September 2016, ponding was present on older areas of SPP in the north of the Site, most likely due to local rainfall. The most recent rain at Muchea prior to the site inspection was 9.6 mm on 28 September (BoM 2016).

Roof run-off from the office building and main shed are collected in rainwater tanks for in-building use.

Environmental suitability for land use

Development of multiple use wetlands, including palusplains, for Light Industrial purposes is considered acceptable from an environmental perspective by Department of Environment Regulation (DER). Without the addition of fill, the site would be seasonally waterlogged. The addition of fill and the SPP ensures that the site is suitable for the current land uses.

Potential issues for water quality and quantity management on the site are:

- management of fuels and chemical storage to prevent losses to surface water and groundwater
- management of waste, including disposal of wastewater and general waste from the site
- management of additional stormwater runoff from the SPP to ensure that sediment is removed and flows to the downstream environment are not increased.

The likelihood of environmental impacts are considered to be relatively low, but management is required. Environmental management measures to mitigate potential impacts from fuel and chemical storage are discussed in Section 5.1.

Wastewater on the site is collected in tanks, which are emptied by a licensed contractor as required. Environmental management of wastewater and general waste is discussed in Section 5.2.

Consideration is also required for the management of additional runoff generated from the SPP in terms of water volumes and quality. This requires the installation of appropriate stormwater detention and treatment structures, as discussed in the *Lots 802 and 803 Great Northern Highway Water Management Strategy* (Strategen 2016).

With the implementation of these measures, the use of the land for the current purposes is considered acceptable and not to pose a potential environmental impact.

4.4 Flora and fauna

The site has been historically cleared. The portions of the site which are not SPP are predominantly cleared paddocks with few trees.

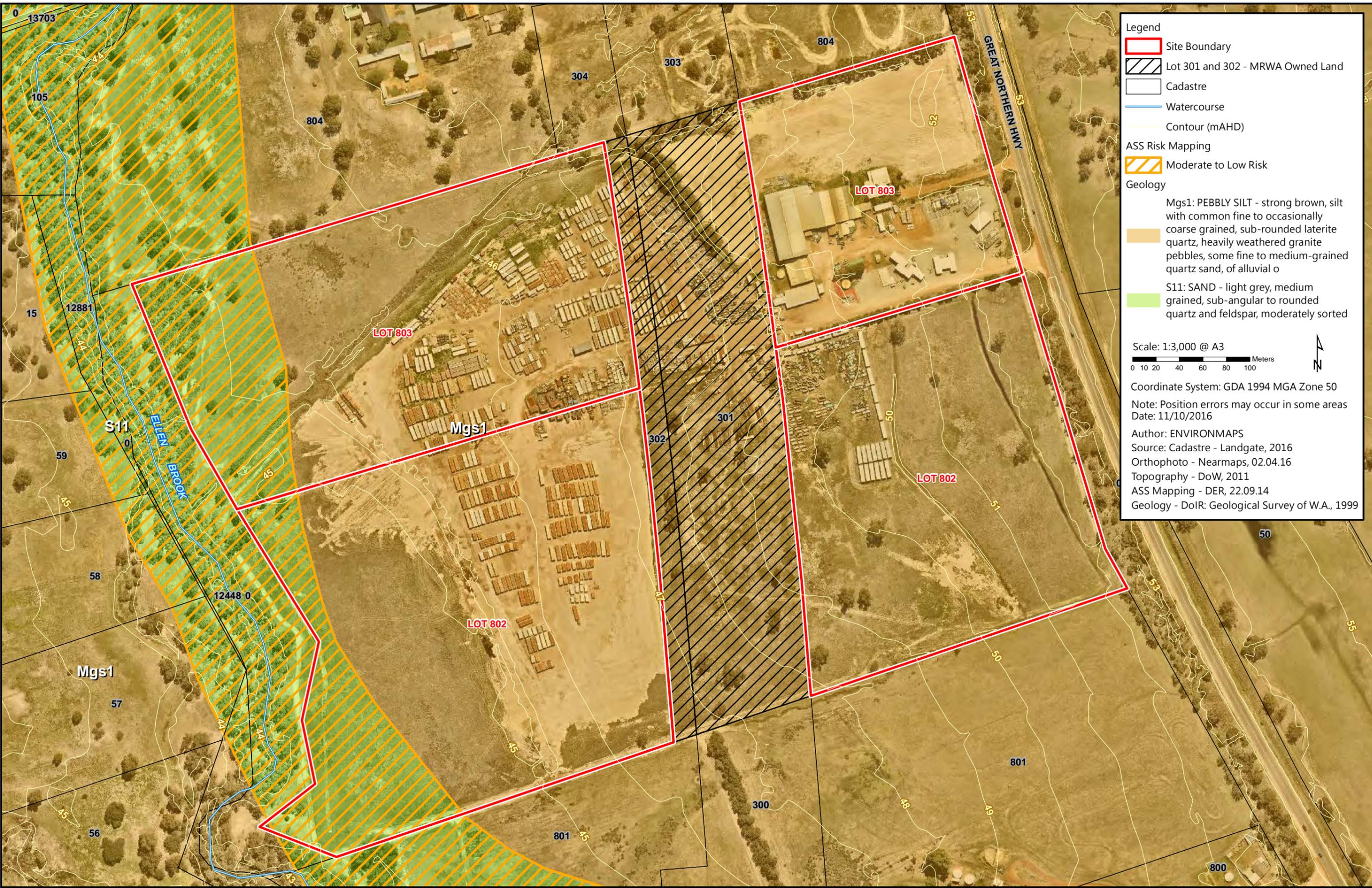
Any individual trees within the approved SPP construction area are located more than 50 m from the existing native vegetation located in the road reserve and the riparian vegetation associated with Ellen Brook. Such clearing is generally exempt from a clearing permit under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Any additional clearing associated with future development or subdivision works will require further consideration at the time of such an application.

Environmental suitability for land use

The use of the Site for the current purposes is not considered to pose a significant impact to flora and fauna.

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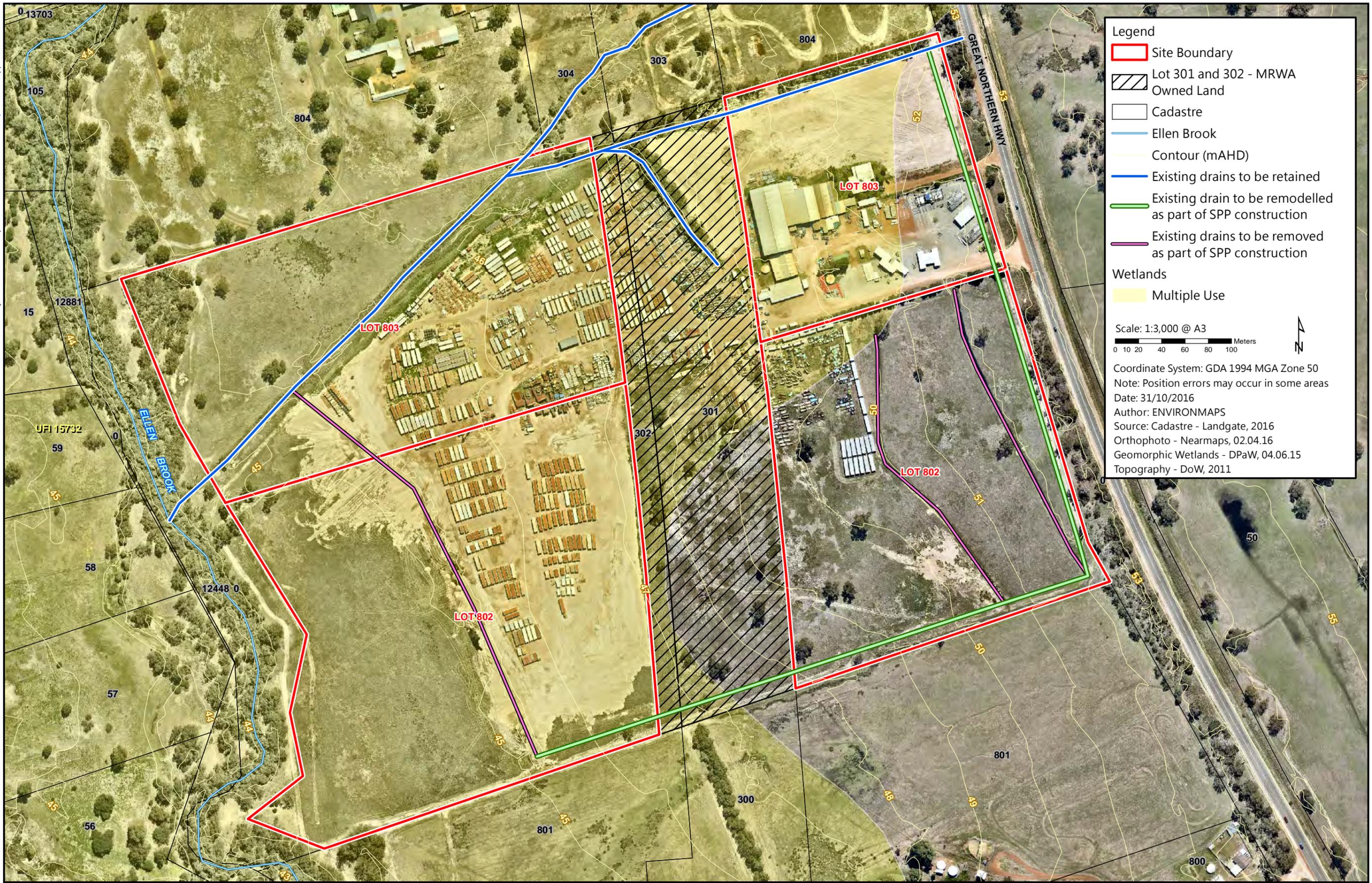
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Lots 802 and 803 Great Northern Highway
Soils and Topography

Figure
3

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Lots 802 and 803 Great Northern Highway
 Surface Water

Figure 4

5. Environmental management

The key aspects of work on the site likely to impact on the quality of the surrounding environment are:

- fuel and chemical management, including vehicles and machinery stored on the site
- waste management, including waste and chemical storage.

Environmental management plans have been developed for these two key matters to minimise the risk of potential environmental impacts. With the implementation of the management measures proposed below, the current uses on the site are considered environmentally acceptable.

5.1 Fuel and chemical management

5.1.1 Environmental objectives, targets and key performance indicators

Environmental objectives, targets and key performance indicators for the management of fuel and chemical storage and emergency response are detailed in Table 1.

Table 1: Environmental objectives, targets and key performance indicators

Objective	Target	Key performance indicator
Prevent contamination of groundwater, surface water and soil.	Fuel and chemicals are stored in accordance with Australian Standards for the storage and handling of flammable and combustible liquids and mixed classes of dangerous goods (AS 1940:2004; AS 3833:2007).	No significant spills or leaks of hydrocarbons.

5.1.2 Management actions

Management actions for fuel and chemical storage and emergency response are detailed in Table 2.

Table 2: Fuel and chemical storage and emergency response management actions

Item	Action	Timing	Responsibility
Induction	All staff will receive information and training on: <ul style="list-style-type: none"> • spill management • spill response • refuelling. 	At induction	Site manager
Servicing	Major servicing of plant and equipment shall be undertaken off-site or undercover in appropriately equipped areas.	At all times	Site manager
Storage	Fuels, lubricants and chemicals such as paint shall be stored undercover in appropriate storage areas (e.g. lockable cupboards, spill trays).	At all times	Site manager
	The location of on-site fuel/chemical storage areas shall be clearly signed and designated.	At all times	Site manager
	Storage and handling of fuels and chemicals shall be in compliance with relevant legislation, regulations and Australian Standards (AS 1940:2004; AS 3833:2007).	At all times	Site manager
Refuelling Equipment/plant	Refuelling shall not be undertaken except at the refuelling point (for vehicles and self-mobile plant) or in undercover areas (for hand held fuel powered devices).	At all times	Site manager
Spills	Spill kits are to be provided as follows: <ul style="list-style-type: none"> • refuelling point: 100 L spill kits • all chemical storage and use areas to have immediate access to 20 L spill kits. 	At all times	Site manager

Lots 802 and 803 Great Northern Highway

Item	Action	Timing	Responsibility
	All vehicles and equipment shall be adequately maintained to minimise drips/leaks of oil and fuel.	At all times	Site manager
	Spills shall be stopped at source as soon as practicable.	At all times	Site manager
	Spilt material shall be recovered as soon as possible, using appropriate equipment.	At all times	Site manager
Material handling and disposal	Hazardous materials or wastes, such as solvents, rust proofing agents and primer, shall be managed, transported, stored and handled in accordance with the requirements of relevant legislation and industry standards (i.e. Australian Dangerous Goods Code and relevant OH&S regulations).	At all times	Site manager
	Contaminated materials such as absorbent pads and soil shall be disposed of to appropriately licensed facilities, consistent with the Waste Management Guidance (Section 5.2).	As required	Site manager
	Handling and disposal of wastes shall comply with the Waste Management Protocol (Section 5.2).	At all times	Site manager
Vehicle and machinery storage	Prior to entering the site: <ul style="list-style-type: none"> vehicles and machinery shall be cleaned volumes of fuel in machinery and vehicles shall be minimised. 	Prior to entering site	Site manager
	Inspection of vehicle storage areas to identify hydrocarbon staining, spills and leaks.	Monthly	Site manager
Oil/water separator	Inspection undertaken to confirm if pump out is required.	Monthly, following relocation of fuel tank	Site manager
Oil/water separator	Pump out undertaken by an appropriate licensed carrier.	As required	Site manager
Safety	Material Safety Data Sheets shall be kept for each chemical used on-site and at a location that is easily accessible to all personnel.	At all times	Site manager

5.1.3 Monitoring and reporting

Where applicable, monitoring and requirements for fuel and chemical storage and emergency response is detailed in Table 3.

Table 3: Monitoring and reporting requirements for fuel and chemical storage and emergency response

Parameter	Purpose	Location	Frequency	Timing	Responsibility
Inspections	Ensure compliance management protocols	Vehicle and machinery storage, refuelling area	Monthly	At all times	Site manager
		Other areas	Quarterly	At all times	Site manager

5.1.4 Contingency measures

Where applicable, contingency measures for fuel and chemical storage and emergency response is detailed in Table 4.

Table 4: Contingency measures for fuel and chemical storage and emergency response

Trigger	Action	Responsibility
Uncontrolled release (i.e. spill, leak) from stored vehicles and machinery	<ol style="list-style-type: none"> Further loss of material to soil and groundwater shall be prevented through use of an oil drip tray or similar. Company responsible for leaking machinery or vehicle shall be advised of the problem and asked to fix the affected vehicle. Following repair, contaminated soil or material shall be removed offsite and disposed of in an approved landfill facility. 	Site manager
Uncontrolled release (i.e. spill, leak) - other locations	<ol style="list-style-type: none"> Further loss of material shall be prevented by addressing the problem. Spillages shall be immediately contained through the use of a spill kit or other containment methods. Ponded material shall be removed as soon as practicable by using an absorbent material. Contaminated soil or material shall be removed offsite and disposed of in an approved landfill facility. 	Site manager
Inappropriate storage of material	<ol style="list-style-type: none"> Investigate why material is being inappropriately stored. Initiate action to ensure compliance. Amend protocol if required. 	Site manager

5.2 Waste management

5.2.1 Background

Waste is generated as a result of activities on site, including the following:

- domestic and putrescible waste from offices and buildings
- construction materials
- effluent.

Waste has the potential to contaminate the site if not managed appropriately.

5.2.2 Environmental objectives, targets and key performance indicators

Environmental objectives, targets and key performance indicators for the management of waste are detailed in Table 5.

Table 5: Environmental objectives, targets and key performance indicators for waste

Objective	Target	Key performance indicator
Minimise pollution or environmental harm due to inappropriate disposal of waste.	No evidence of waste pollution on the site or immediate surrounds.	No uncontained waste, rubbish or litter is found within the construction area at facilities during construction.
		Waste material is contained and disposed of in accordance with <i>Environment Protection Act 1986</i> .

5.2.3 Management actions

Management actions for waste are detailed in Table 6.

Table 6: Management actions for waste

Item	Action	Timing	Responsibility
Induction	All staff shall be inducted in relation to appropriate waste management and disposal measures.	At commencement	Site manager
General	All waste shall be removed from the site for reuse/recycling/disposal.	At all times	Site manager
	All wastes shall be stored in undercover areas or in bins with lids.	At all times	Site manager
	All waste shall be collected and transported to appropriately licensed disposal sites.	As required	Site manager
Ablution facilities	Septage collected within sanitary or ablution facilities shall be either removed by a licensed contractor or disposed of to a licensed facility.	As required	Site manager
Oil, solvents and Chemicals	Waste oil, solvents and other toxic material, shall be collected for off-site reuse, recycling, treatment or disposal.	At all times	Site manager
	Licensed carriers shall be used for off-site transport and disposal.	As required	Site manager
Construction office / administration	Litter bins shall be provided within construction areas.	At all times	Site manager
	Litter bins and waste containers shall be covered as necessary to prevent: <ul style="list-style-type: none"> access by fauna waste falling out of the container as a result of overfilling waste material being blown out of the container by wind. 	At all times	Site manager
	All waste storage containers shall be regularly emptied and waste removed from site.	At all times	Site manager
	Domestic wastes (e.g. sewage, kitchen/putrescible, grey water, packaging etc) shall be disposed of to a licensed facility.	At all times	Site manager

5.2.4 Monitoring and reporting

Monitoring and reporting requirements for waste are detailed in Table 7.

Table 7: Waste monitoring and reporting requirements

Parameter	Purpose	Location	Frequency	Timing	Responsibility
Inspection	Ensure appropriate disposal of waste material	Site	Monthly Opportunistically	At all times	Site manager

5.2.5 Contingency measures

Contingency measures for the management of waste are detailed in Table 8.

Table 8: Contingency measures for waste

Trigger	Action	Responsibility
Inappropriate disposal of waste	<ol style="list-style-type: none"> Investigate cause of inappropriate disposal. Initiate action to rectify disposal methods. Amend protocol to avoid recurrences. 	Site manager

6. Summary and conclusions

The use of the site for the current purposes is considered environmentally acceptable with appropriate management of water quality and volume provided water quality and stormwater flows are appropriately managed. In summary:

1. While the site is low lying and seasonally waterlogged, this can and is being managed by the addition of fill to the site.
2. The soil types on the site are considered suitable for use for Light Industrial purposes.
3. Development of multiple use wetlands for Light Industrial purposes is considered acceptable by DER.
4. While the use of the site for the current purposes may potentially impact upon surface water and groundwater quality and flows, this can be managed through:
 - appropriate management of fuel and chemical storage
 - appropriate management of waste, including wastewater
 - installation of stormwater management structures to maintain flows off the site and minimise impacts to water quality.
5. The site has been historically cleared and is considered to be of low value from a vegetation perspective and as fauna habitat.

With the implementation of the management measures outlined in Section 5, the use of the site for the current purposes is considered to be environmentally acceptable.

7. References

Aussie Modular Solutions (AMS) 2015, *Stormwater Management Plan*, AMS, Muchea.

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Lots 802 and 803 Great Northern Highway

Environmental Report

Prepared for
Planning Solutions
by Strategen

February 2017

Lots 802 and 803 Great Northern Highway

Environmental Report

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February 2017

Limitations

Scope of services

This report ("the report") has been prepared by Strategen Environmental Consultants Pty Ltd (Strategen) in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

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Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

Client: Planning Solutions

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Preliminary Draft Report	A	Client review	M Dunlop/ D Newsome	Electronic	13/10/16
Draft Report	B	Client review	M Dunlop/ D Newsome	Electronic	1/11/16
Final Draft Report	C	Client review	M Dunlop/ D Newsome	Electronic	11/11/16
Revised Final Draft Report	D	Client review	M Dunlop/ D Newsome	Electronic	17/1/17
Revised Final Draft Report	E	Client review	M Dunlop/ D Newsome	Electronic	20/1/17
Final Report	0	Agency Submission	M Dunlop/ D Newsome	Electronic	10/2/17

Filename: PSO16487_01 R001 Rev 0 - 10 February 2017

Table of contents

1. Introduction	1
1.1 Background	1
1.2 Scope	1
1.3 Report structure	1
2. Legislative context	1
3. Activities undertaken on the site	5
3.1 Approved construction works	5
3.2 Demountable building construction and storage	6
3.3 Skip bin storage and refurbishment	6
3.4 Vehicle and machinery storage	9
4. Existing environment	10
4.1 Topography	10
4.2 Soils	10
4.3 Groundwater and surface water	10
4.4 Flora and fauna	11
5. Environmental management	15
5.1 Fuel and chemical management	15
5.1.1 Environmental objectives, targets and key performance indicators	15
5.1.2 Management actions	15
5.1.3 Monitoring and reporting	16
5.1.4 Contingency measures	16
5.2 Waste management	17
5.2.1 Background	17
5.2.2 Environmental objectives, targets and key performance indicators	17
5.2.3 Management actions	17
5.2.4 Monitoring and reporting	18
5.2.5 Contingency measures	18
6. Summary and conclusions	19
7. References	20

List of tables

Table 1: Environmental objectives, targets and key performance indicators	15
Table 2: Fuel and chemical storage and emergency response management actions	15
Table 3: Monitoring and reporting requirements for fuel and chemical storage and emergency response	16
Table 4: Contingency measures for fuel and chemical storage and emergency response	17
Table 5: Environmental objectives, targets and key performance indicators for waste	17
Table 6: Management actions for waste	18
Table 7: Waste monitoring and reporting requirements	18
Table 8: Contingency measures for waste	18

List of figures

Figure 1: Site layout	3
Figure 2: Approved works	7
Figure 3: Soils and topography	13
Figure 4: Surface water	14

List of plates

Plate 1: Semi-pervious pavement	5
Plate 2: New SPP area adjacent to drain on the southern boundary of the site.	6
Plate 3: Vehicle and machinery storage	9

1. Introduction

1.1 Background

Karratha Enterprises wish to seek retrospective development approval for additional storage activities taking place (specifically mining equipment/vehicles and skip bins) at Lots 802 and 803 Great Northern Highway, Muchea (the site). The site is located approximately 40km north-north-east of Perth in the Shire of Chittering (Shire) and has total area is 29.543 ha.

The site is approved for the manufacture of sheds, kit homes and other transportable buildings (and associated/incidental transport and freight operations, temporary storage and open air display of products/materials).

The lots abut Ellen Brook Foreshore Reserve to the west (Figure 1). The proposed Perth-Darwin Highway is located in the centre of the Site, and this land is held by Main Roads WA (Figure 1).

1.2 Scope

The scope of the work was to the suitability of land uses occurring on site and subject to retrospective planning approval, and any appropriate environmental management measures required. A separate water management strategy has been prepared for the site.

1.3 Report structure

The report has been structured to include:

- legislative context (Section 2)
- description of the approved works and activities currently undertaken on the site (Section 3)
- discussion of the existing environment and the suitability of the site for the activities currently undertaken on the site (Section 4)
- environmental management measures for activities that may potentially pose an environmental risk (Section 5)
- summary and conclusions (Section 6).

2. Legislative context

The desktop and environmental field survey has been conducted with reference to the following Australian and Western Australian legislation:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – Australian Government
- *Wildlife Conservation Act 1950* (WC Act) – State
- *Environmental Protection Act 1986* (EP Act) – State
- *Biosecurity and Agriculture Management Act 2007* (BAM Act) – State
- *Contaminated Sites Act 2003* (CS Act) -State
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) - Federal.

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Lots 802 and 803 Great Northern Highway
Site Layout

Figure
1

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3. Activities undertaken on the site

This section provides a summary of the activities undertaken on the site and the potential environmental risks posed by these activities.

3.1 Approved construction works

Portions of the Site that contain buildings and/or are currently used for vehicle and demountable storage have been filled and raised to a level above the remainder of the Site, as approved by the Shire. Karratha Enterprises are currently converting areas of the site to hardstand as approved by the Shire (AMS 2015, Figure 2). The 'hardstand' consists of compacted sand covered by engineered fill and resembles a compacted gravel road (Plate 1).



Plate 1: Semi-pervious pavement

Based on the site inspection and information provided in the Stormwater Management Plan (AMS 2015) the material is considered to be a semi-permeable pavement (SPP). The SPP is constructed of a layer of 0.3 to 1.2 m of sand overlain with minimum of 0.3 m of engineered fill with greater than 80% of particles having a size of between 0.1 and 1 mm (AMS 2015), equivalent to a fine to medium grained sand. Plate 2 shows the edge of the new SPP and the separation from the pre-development levels. The engineered fill is compacted with a roller. The material has been sourced from an approved recycling facility and passes appropriate health and environmental standards for use in commercial and industrial areas (AMS 2015).



Plate 2: New SPP area adjacent to drain on the southern boundary of the site.

Ponding was noted in areas of SPP, despite the lack of rain in the two days prior to the site inspection (Plate 1). There was no evidence of drainage pathways or erosion from the new SPP, indicating the material is relatively permeable.

3.2 Demountable building construction and storage

Because of the size of the transportable buildings, construction of demountable buildings occurs largely outdoors. The construction process involves welding of material to construct frames and the use of pre-fabricated materials such as bonded steel, marine ply wood and expanded foam. This limits the requirement for the use of chemicals such as paints and glues in construction. Small volumes of paints and glues are stored on the site for use in transportable construction.

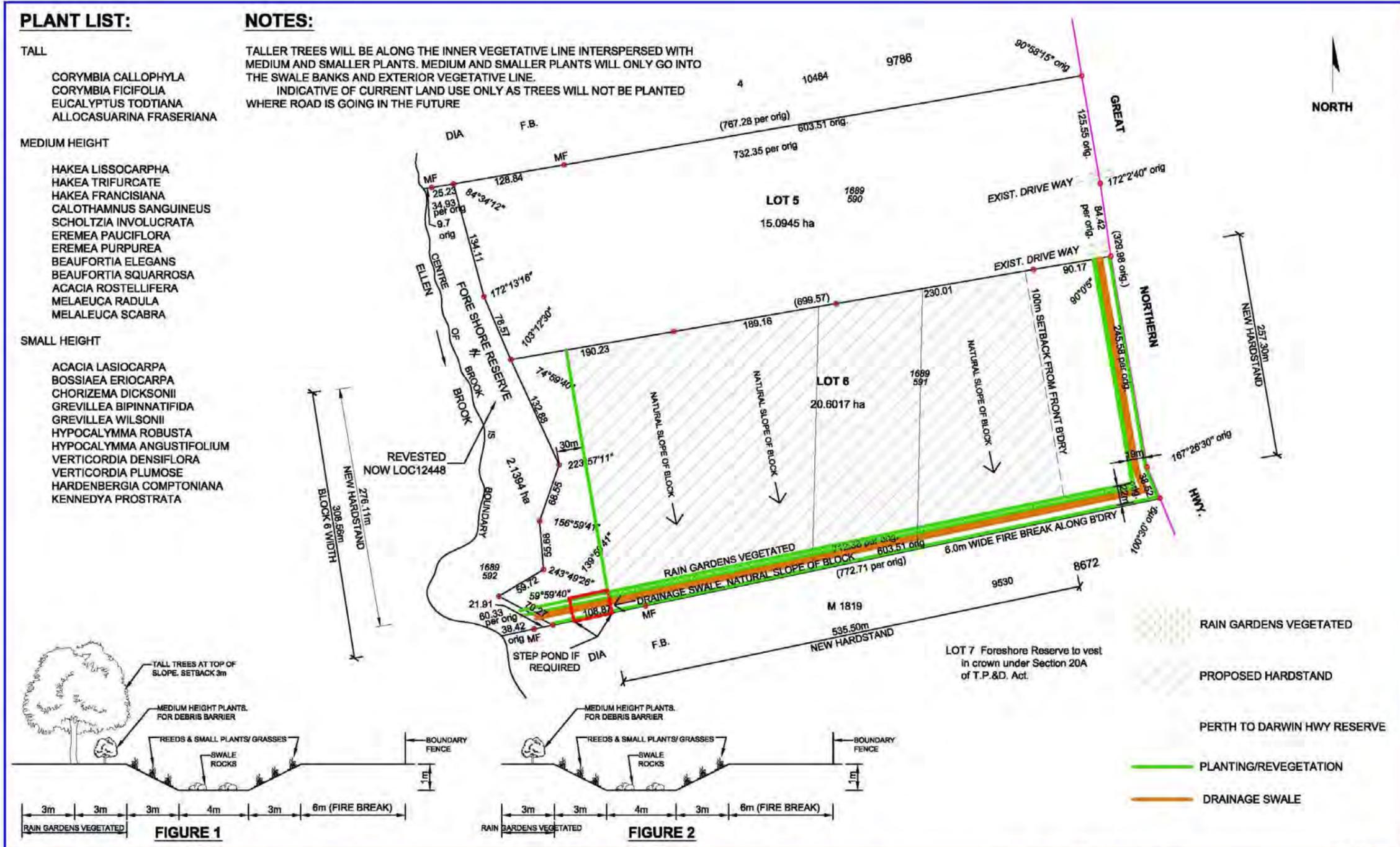
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The risks to the environment and waterways associated with demountable construction and storage are considered to be low. To minimise environmental risks, chemicals and waste materials from demountable construction should be managed as described in Section 5.

3.3 Skip bin storage and refurbishment

Skip bins are bought to the site for storage and stored on a SPP area. Skip bins are cleaned prior to entering the site.

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Client: -

Address: -

Rev	VO Number and Description	DRN	DATE	CHK
0	ISSUED FOR REVIEW	LV	18/03/15	NC
1	ISSUED FOR SHIRE SUBMISSION	LV	10/09/15	NC
2	RE-ISSUED FOR SHIRE SUBMISSION	LV	25/09/15	NC
3	RE-ISSUED FOR SHIRE SUBMISSION	LV	18/11/15	TB

Model	SITE PLAN	Date Drawn	18/03/15
Job No		Revision N°	3
SCALE: 1:4000 @ A3		Sheet N°	1 of 1
Sub-Contractors to verify all dimensions on site			
© This Drawing is the copyright of Aussie Modular Solutions under the commonwealth copyright act.			

Figure 2: Approved works



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Repairs are conducted in an undercover area, the risks to the environment and waterways associated with the refurbishment are considered to be low.

3.4 Vehicle and machinery storage

Mining vehicles and associated machinery are stored on site on behalf of Downer, who rent a portion of the site (Plate 3). The machinery is stored on SPP areas. Plant and equipment are cleaned before entering site to prevent contaminants, including weed seeds and hydrocarbons, entering the site.



Plate 3: Vehicle and machinery storage

Downer has prepared their own environmental management plan (EMP) for the storage (Downer, undated) which includes spill management procedures. Downer undertakes environmental inspections on a minimum of quarterly (typically monthly) basis. All non-conformances, corrective actions and opportunities for improvements that are identified through inspections and audits are recorded and managed through Downer's internal audit process.

No evidence of leakage of fuels or hydrocarbons from the vehicles was noted during the site inspection. Karratha Enterprises advises that vehicles are drained of fuel prior to entering the site (Carrington N [Karratha Enterprises] 2016, pers. comm. 30 September).

The storage of vehicles and machinery on the Site has the potential to result in leaks of fuel and other hydrocarbons such as oil and grease. Given the permeability of the SPP, spilled or leaked hydrocarbons may be absorbed into the soil and enter groundwater. As the vehicles and machinery are not used on the site, the main source of hydrocarbons is likely to be leaks, which are likely to be slow and of comparatively small volume.

Management measures for spills and leaks from vehicles on the site are discussed in Section 5.1.

4. Existing environment

4.1 Topography

The 2011 LIDAR is the most recent topography available for the whole site, and indicates the site varies from approximately 53 mAHD in the east of the Great Northern Highway to 44 mAHD in the west adjacent to Ellen Brook. Earthworks have been undertaken on the site since 2011 to raise the site and were ongoing at the time of writing, in accordance with previous development approvals issued by the Shire.

Environmental suitability for land use

With the addition of fill as described in Section 3.1 as approved by the Shire, the site topography is not considered to pose an environmental constraint to the use of the site for the current purposes. Low-lying land is commonly developed for Light Industrial purposes, as occurs in the Hazelmere and Kwinana areas.

4.2 Soils

Site geology is mapped by Gozzard (1982) as:

- Sand - light grey, medium grained, sub-angular to rounded quartz and feldspar, moderately sorted, in the vicinity of Ellen Brook
- Pebbly Silt (Guildford Formation) - strong brown silt with common fine to occasionally coarse grained, sub rounded laterite, quartz, heavily weathered granite pebbles, some fine to medium grained quartz sand of alluvial origin (Figure 1).

Strategen undertook a site inspection on 30 September 2016. The soils in the undeveloped parts of the site appeared to be variable, including fine clayey sands, sandy clays and peaty sand materials.

The site is mapped as having low to no risk of Acid Sulphate Soils (ASS) over most of the Site. The area adjacent to Ellen Brook is mapped as having a moderate to low risk of ASS occurring within 3 m of the natural surface.

Environmental suitability for land use

Soils and geology are not considered to pose an environmental constraint to the use of the site for the current purposes. The soil properties of the site are not considered to be negatively affected by use for the current purposes.

4.3 Groundwater and surface water

The majority of the site is mapped by Department of Parks and Wildlife as part of a multiple use palusplain or seasonally waterlogged flat (Figure 4). At the time of site inspection on 30 September 2016, portions of the Site that had not been filled were predominantly waterlogged, with water at or close to the surface.

The site contains a large drain which runs in an approximately east-west direction across the Site, before heading south-west towards Ellen Brook. A number of smaller drains are also present along the edge of the road. Where new areas of SPP are to be constructed the south of the site, drains within the SPP area are being relocated to the edge of the SPP area to ensure continuation of flow paths.

The site owner advised that the site receives drainage from areas to the east, including Great Northern Highway. The site has been subject to areas of ponding during winter and storm events (AMS 2015).

At the time of inspection by Strategen on 30 September 2016, ponding was present on older areas of SPP in the north of the Site, most likely due to local rainfall. The most recent rain at Muchea prior to the site inspection was 9.6 mm on 28 September (BoM 2016).

Roof run-off from the office building and main shed are collected in rainwater tanks for in-building use.

Environmental suitability for land use

Development of multiple use wetlands, including palusplains, for Light Industrial purposes is considered acceptable from an environmental perspective by Department of Environment Regulation (DER). Without the addition of fill, the site would be seasonally waterlogged. The addition of fill and the SPP ensures that the site is suitable for the current land uses.

Potential issues for water quality and quantity management on the site are:

- management of fuels and chemical storage to prevent losses to surface water and groundwater
- management of waste, including disposal of wastewater and general waste from the site
- management of additional stormwater runoff from the SPP to ensure that sediment is removed and flows to the downstream environment are not increased.

The likelihood of environmental impacts are considered to be relatively low, but management is required. Environmental management measures to mitigate potential impacts from fuel and chemical storage are discussed in Section 5.1.

Wastewater on the site is collected in tanks, which are emptied by a licensed contractor as required. Environmental management of wastewater and general waste is discussed in Section 5.2.

Consideration is also required for the management of additional runoff generated from the SPP in terms of water volumes and quality. This requires the installation of appropriate stormwater detention and treatment structures, as discussed in the *Lots 802 and 803 Great Northern Highway Water Management Strategy* (Strategen 2016).

With the implementation of these measures, the use of the land for the current purposes is considered acceptable and not to pose a potential environmental impact.

4.4 Flora and fauna

The site has been historically cleared. The portions of the site which are not SPP are predominantly cleared paddocks with few trees.

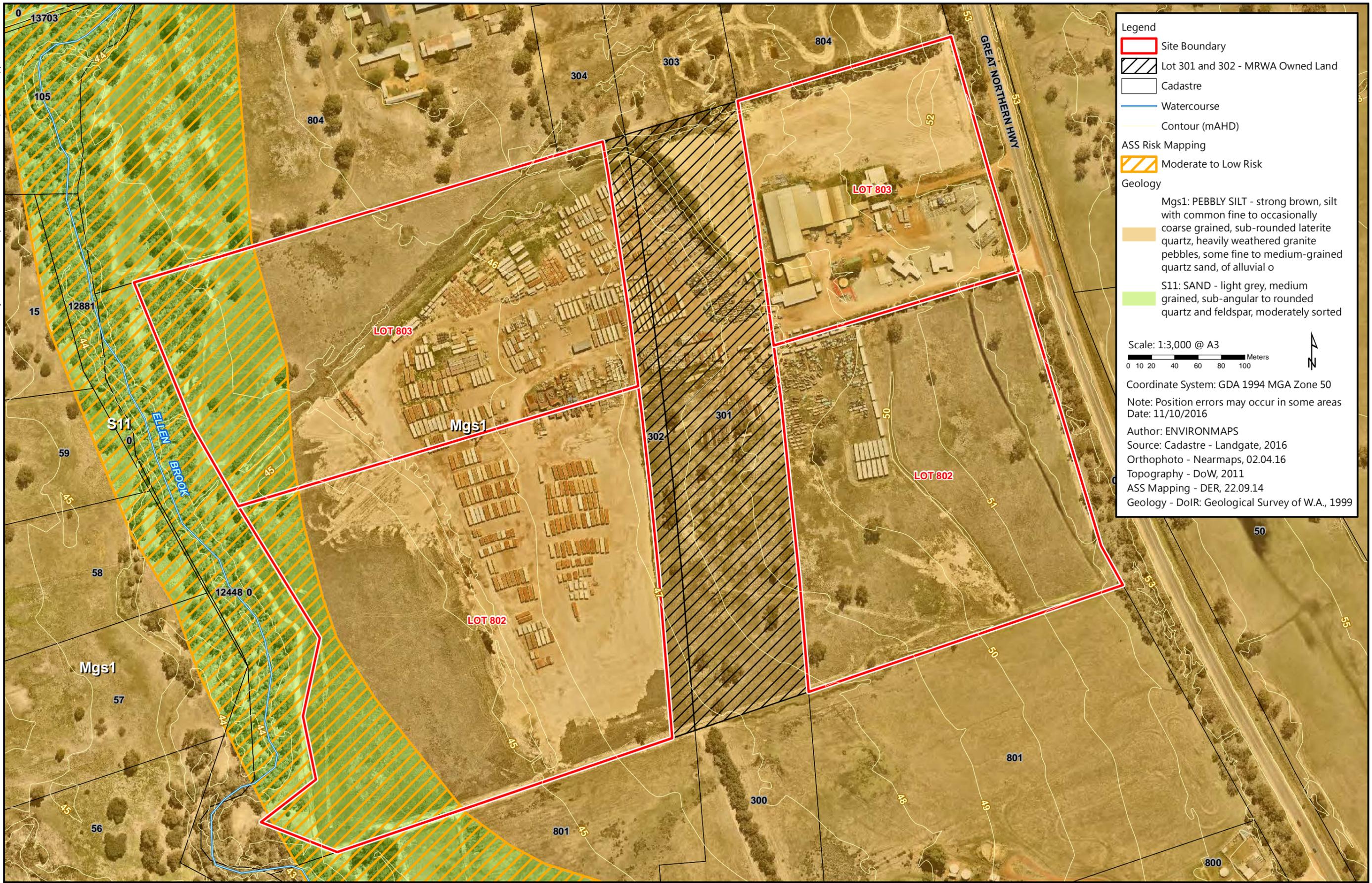
Any individual trees within the approved SPP construction area are located more than 50 m from the existing native vegetation located in the road reserve and the riparian vegetation associated with Ellen Brook. Such clearing is generally exempt from a clearing permit under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Any additional clearing associated with future development or subdivision works will require further consideration at the time of such an application.

Environmental suitability for land use

The use of the Site for the current purposes is not considered to pose a significant impact to flora and fauna.

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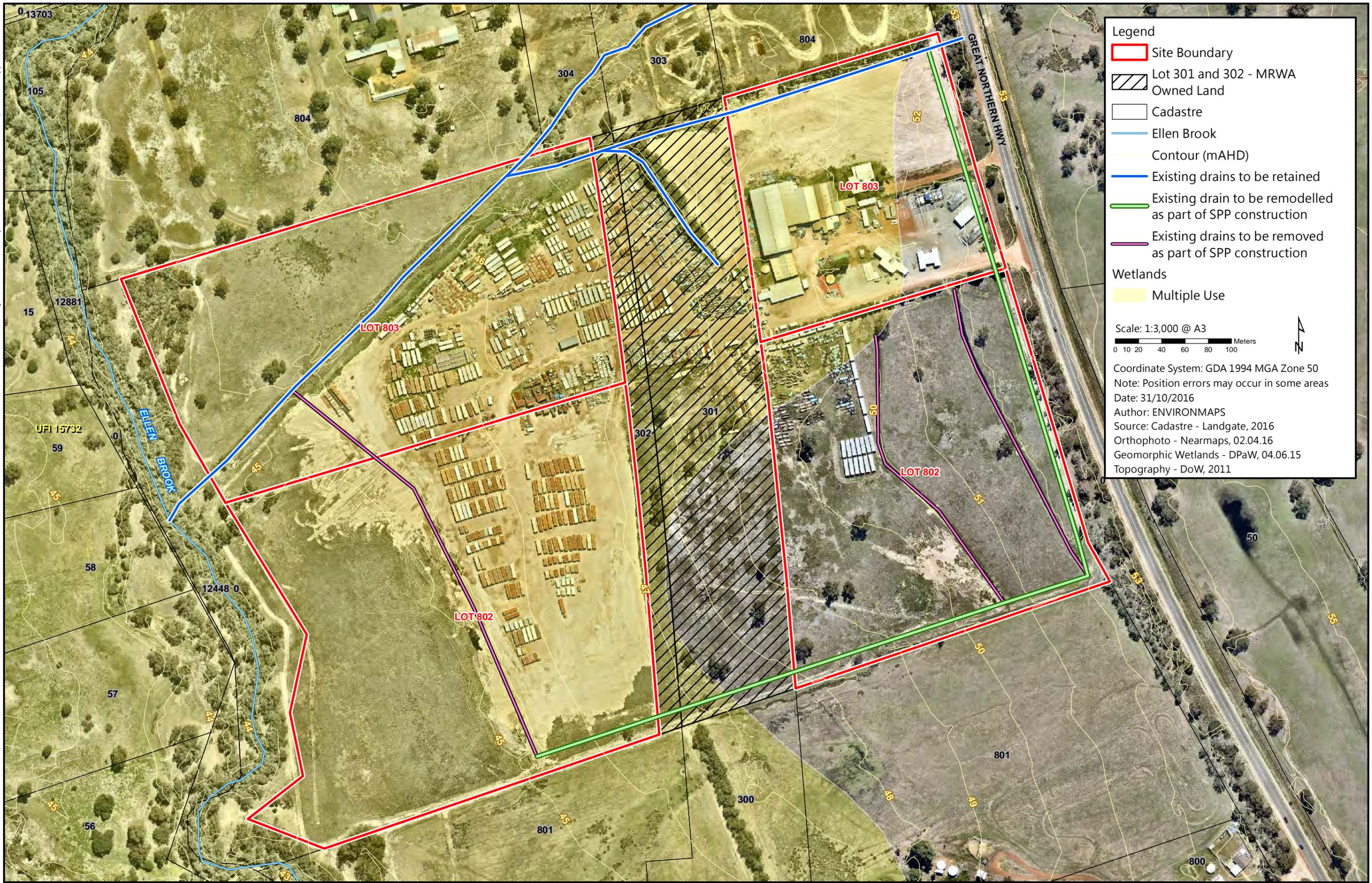
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Lots 802 and 803 Great Northern Highway
 Soils and Topography

Figure
 3

Created by ENVIRONMAPS | e: simoncrofts@environmaps.com.au | p: 0406 590 006



Lots 802 and 803 Great Northern Highway
 Surface Water

Figure
 4

5. Environmental management

The key aspects of work on the site likely to impact on the quality of the surrounding environment are:

- fuel and chemical management, including vehicles and machinery stored on the site
- waste management, including waste and chemical storage.

Environmental management plans have been developed for these two key matters to minimise the risk of potential environmental impacts. With the implementation of the management measures proposed below, the current uses on the site are considered environmentally acceptable.

5.1 Fuel and chemical management

5.1.1 Environmental objectives, targets and key performance indicators

Environmental objectives, targets and key performance indicators for the management of fuel and chemical storage and emergency response are detailed in Table 1.

Table 1: Environmental objectives, targets and key performance indicators

Objective	Target	Key performance indicator
Prevent contamination of groundwater, surface water and soil.	Fuel and chemicals are stored in accordance with Australian Standards for the storage and handling of flammable and combustible liquids and mixed classes of dangerous goods (AS 1940:2004; AS 3833:2007).	No significant spills or leaks of hydrocarbons.

5.1.2 Management actions

Management actions for fuel and chemical storage and emergency response are detailed in Table 2.

Table 2: Fuel and chemical storage and emergency response management actions

Item	Action	Timing	Responsibility
Induction	All staff will receive information and training on: <ul style="list-style-type: none"> • spill management • spill response • refuelling. 	At induction	Site manager
Servicing	Major servicing of plant and equipment shall be undertaken off-site or undercover in appropriately equipped areas.	At all times	Site manager
Storage	Fuels, lubricants and chemicals such as paint shall be stored undercover in appropriate storage areas (e.g. lockable cupboards, spill trays).	At all times	Site manager
	The location of on-site fuel/chemical storage areas shall be clearly signed and designated.	At all times	Site manager
	Storage and handling of fuels and chemicals shall be in compliance with relevant legislation, regulations and Australian Standards (AS 1940:2004; AS 3833:2007).	At all times	Site manager
Refuelling Equipment/plant	Refuelling shall not be undertaken except at the refuelling point (for vehicles and self-mobile plant) or in undercover areas (for hand held fuel powered devices).	At all times	Site manager
Spills	Spill kits are to be provided as follows: <ul style="list-style-type: none"> • refuelling point: 100 L spill kits • all chemical storage and use areas to have immediate access to 20 L spill kits. 	At all times	Site manager

Lots 802 and 803 Great Northern Highway

Item	Action	Timing	Responsibility
	All vehicles and equipment shall be adequately maintained to minimise drips/leaks of oil and fuel.	At all times	Site manager
	Spills shall be stopped at source as soon as practicable.	At all times	Site manager
	Spilt material shall be recovered as soon as possible, using appropriate equipment.	At all times	Site manager
Material handling and disposal	Hazardous materials or wastes, such as solvents, rust proofing agents and primer, shall be managed, transported, stored and handled in accordance with the requirements of relevant legislation and industry standards (i.e. Australian Dangerous Goods Code and relevant OH&S regulations).	At all times	Site manager
	Contaminated materials such as absorbent pads and soil shall be disposed of to appropriately licensed facilities, consistent with the Waste Management Guidance (Section 5.2).	As required	Site manager
	Handling and disposal of wastes shall comply with the Waste Management Protocol (Section 5.2).	At all times	Site manager
Vehicle and machinery storage	Prior to entering the site: <ul style="list-style-type: none"> vehicles and machinery shall be cleaned volumes of fuel in machinery and vehicles shall be minimised. 	Prior to entering site	Site manager
	Inspection of vehicle storage areas to identify hydrocarbon staining, spills and leaks.	Monthly	Site manager
Oil/water separator	Inspection undertaken to confirm if pump out is required.	Monthly, following relocation of fuel tank	Site manager
Oil/water separator	Pump out undertaken by an appropriate licensed carrier.	As required	Site manager
Safety	Material Safety Data Sheets shall be kept for each chemical used on-site and at a location that is easily accessible to all personnel.	At all times	Site manager

5.1.3 Monitoring and reporting

Where applicable, monitoring and requirements for fuel and chemical storage and emergency response is detailed in Table 3.

Table 3: Monitoring and reporting requirements for fuel and chemical storage and emergency response

Parameter	Purpose	Location	Frequency	Timing	Responsibility
Inspections	Ensure compliance management protocols	Vehicle and machinery storage, refuelling area	Monthly	At all times	Site manager
		Other areas	Quarterly	At all times	Site manager

5.1.4 Contingency measures

Where applicable, contingency measures for fuel and chemical storage and emergency response is detailed in Table 4.

Table 4: Contingency measures for fuel and chemical storage and emergency response

Trigger	Action	Responsibility
Uncontrolled release (i.e. spill, leak) from stored vehicles and machinery	<ol style="list-style-type: none"> 1. Further loss of material to soil and groundwater shall be prevented through use of an oil drip tray or similar. 2. Company responsible for leaking machinery or vehicle shall be advised of the problem and asked to fix the affected vehicle. 3. Following repair, contaminated soil or material shall be removed offsite and disposed of in an approved landfill facility. 	Site manager
Uncontrolled release (i.e. spill, leak) - other locations	<ol style="list-style-type: none"> 1. Further loss of material shall be prevented by addressing the problem. 2. Spillages shall be immediately contained through the use of a spill kit or other containment methods. 3. Poned material shall be removed as soon as practicable by using an absorbent material. 4. Contaminated soil or material shall be removed offsite and disposed of in an approved landfill facility. 	Site manager
Inappropriate storage of material	<ol style="list-style-type: none"> 1. Investigate why material is being inappropriately stored. 2. Initiate action to ensure compliance. 3. Amend protocol if required. 	Site manager

5.2 Waste management

5.2.1 Background

Waste is generated as a result of activities on site, including the following:

- domestic and putrescible waste from offices and buildings
- construction materials
- effluent.

Waste has the potential to contaminate the site if not managed appropriately.

5.2.2 Environmental objectives, targets and key performance indicators

Environmental objectives, targets and key performance indicators for the management of waste are detailed in Table 5.

Table 5: Environmental objectives, targets and key performance indicators for waste

Objective	Target	Key performance indicator
Minimise pollution or environmental harm due to inappropriate disposal of waste.	No evidence of waste pollution on the site or immediate surrounds.	No uncontained waste, rubbish or litter is found within the construction area at facilities during construction.
		Waste material is contained and disposed of in accordance with <i>Environment Protection Act 1986</i> .

5.2.3 Management actions

Management actions for waste are detailed in Table 6.

Table 6: Management actions for waste

Item	Action	Timing	Responsibility
Induction	All staff shall be inducted in relation to appropriate waste management and disposal measures.	At commencement	Site manager
General	All waste shall be removed from the site for reuse/recycling/disposal.	At all times	Site manager
	All wastes shall be stored in undercover areas or in bins with lids.	At all times	Site manager
	All waste shall be collected and transported to appropriately licensed disposal sites.	As required	Site manager
Ablution facilities	Septage collected within sanitary or ablution facilities shall be either removed by a licensed contractor or disposed of to a licensed facility.	As required	Site manager
Oil, solvents and Chemicals	Waste oil, solvents and other toxic material, shall be collected for off-site reuse, recycling, treatment or disposal.	At all times	Site manager
	Licensed carriers shall be used for off-site transport and disposal.	As required	Site manager
Construction office / administration	Litter bins shall be provided within construction areas.	At all times	Site manager
	Litter bins and waste containers shall be covered as necessary to prevent: <ul style="list-style-type: none"> access by fauna waste falling out of the container as a result of overfilling waste material being blown out of the container by wind. 	At all times	Site manager
	All waste storage containers shall be regularly emptied and waste removed from site.	At all times	Site manager
	Domestic wastes (e.g. sewage, kitchen/putrescible, grey water, packaging etc) shall be disposed of to a licensed facility.	At all times	Site manager

5.2.4 Monitoring and reporting

Monitoring and reporting requirements for waste are detailed in Table 7.

Table 7: Waste monitoring and reporting requirements

Parameter	Purpose	Location	Frequency	Timing	Responsibility
Inspection	Ensure appropriate disposal of waste material	Site	Monthly Opportunistically	At all times	Site manager

5.2.5 Contingency measures

Contingency measures for the management of waste are detailed in Table 8.

Table 8: Contingency measures for waste

Trigger	Action	Responsibility
Inappropriate disposal of waste	<ol style="list-style-type: none"> Investigate cause of inappropriate disposal. Initiate action to rectify disposal methods. Amend protocol to avoid recurrences. 	Site manager

6. Summary and conclusions

The use of the site for the current purposes is considered environmentally acceptable with appropriate management of water quality and volume provided water quality and stormwater flows are appropriately managed. In summary:

1. While the site is low lying and seasonally waterlogged, this can and is being managed by the addition of fill to the site.
2. The soil types on the site are considered suitable for use for Light Industrial purposes.
3. Development of multiple use wetlands for Light Industrial purposes is considered acceptable by DER.
4. While the use of the site for the current purposes may potentially impact upon surface water and groundwater quality and flows, this can be managed through:
 - appropriate management of fuel and chemical storage
 - appropriate management of waste, including wastewater
 - installation of stormwater management structures to maintain flows off the site and minimise impacts to water quality.
5. The site has been historically cleared and is considered to be of low value from a vegetation perspective and as fauna habitat.

With the implementation of the management measures outlined in Section 5, the use of the site for the current purposes is considered to be environmentally acceptable.

7. References

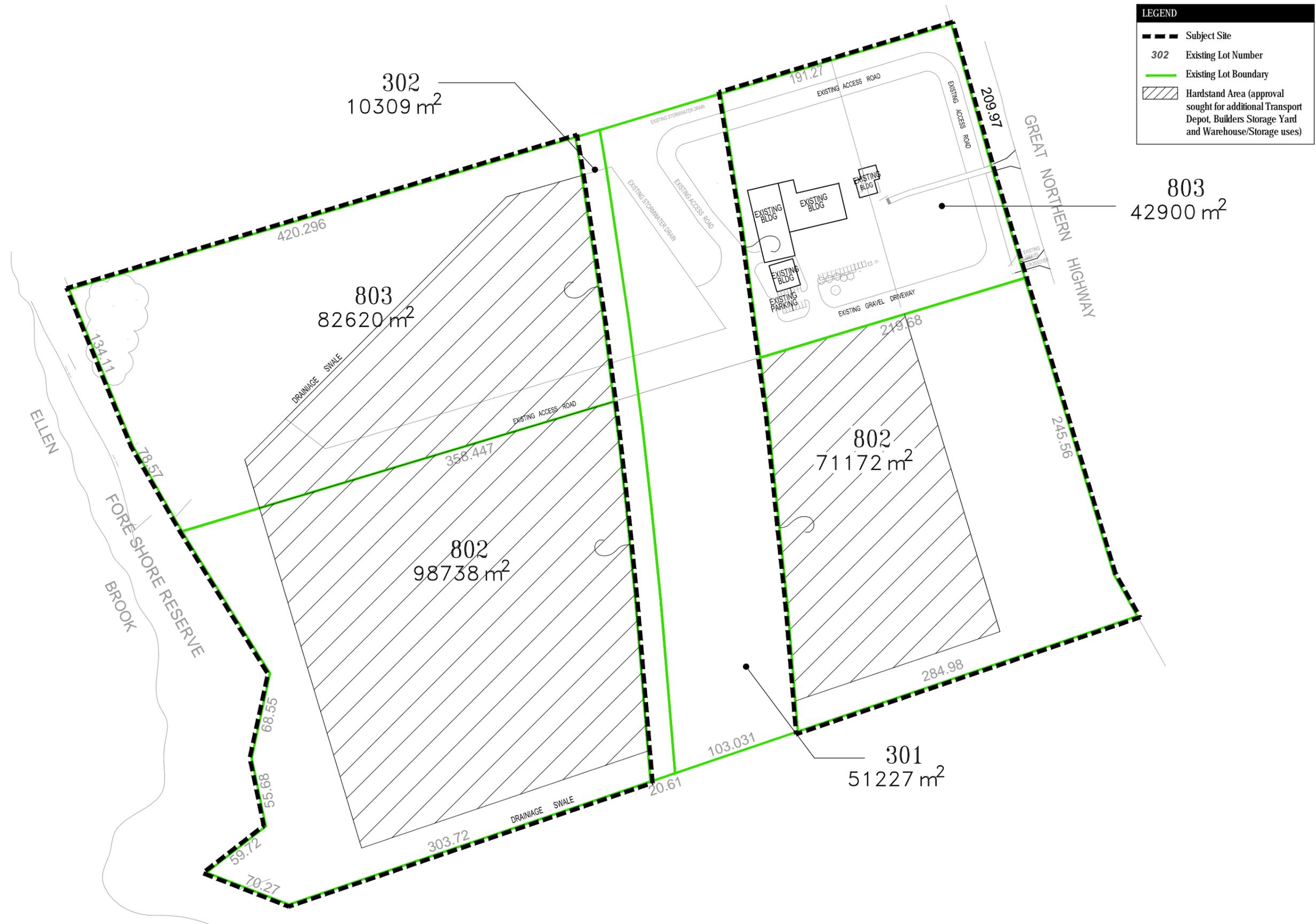
Aussie Modular Solutions (AMS) 2015, *Stormwater Management Plan*, AMS, Muchea.

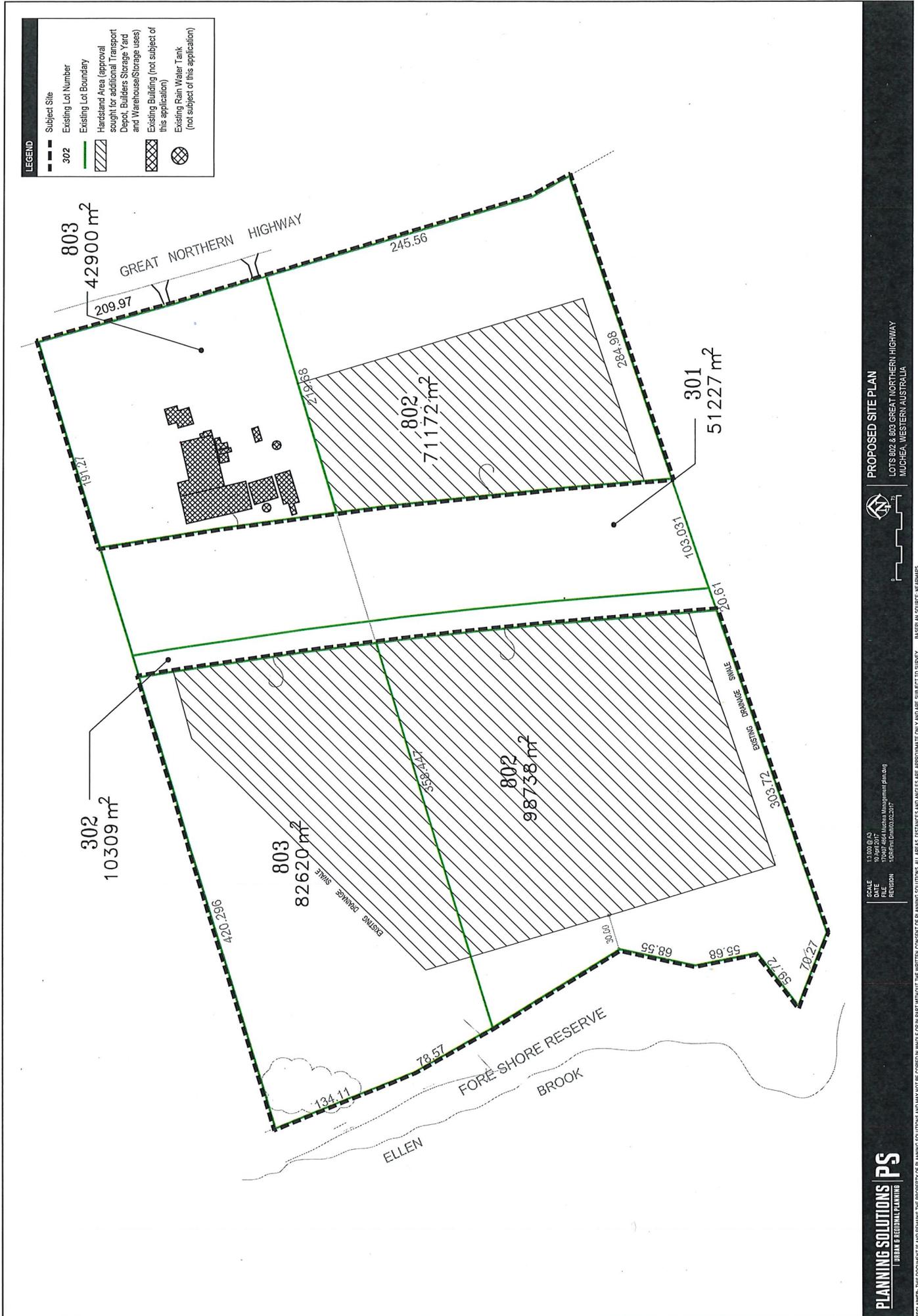
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Gozzard JR 1982, *Muchea Sheet 2034 I and Part 2134 IV*, Environmental Geology Series, Geological Survey of Western Australia, Perth.

Strategen 2016 *Lots 802 and 803 Great Northern Highway Water Management Strategy*, unpublished report to Planning Solutions, November 2016.

Whitlow 1995, *Basic Soil Mechanics*, 3rd Edition, Longman Group, London.





Item 9.1.2

Attachment 1

History - Lot 803 (previously Lot 5)

Date	Proposal	Approved/Refused	Conditions
04.02.83	Extension to existing shed	Approved Building Permit - No Planning	No conditions
04.02.83	Veranda extension to existing dwelling	Approved Building Permit - No Planning	No conditions
05.02.88	Hay Shed - 414m ²	Approved Building Permit - No Planning	No conditions
05.02.88	Storage Shed - 51.84m ²	Stamped but not signed	No conditions
15.07.88	Storage Shed - 420m ²	Approved Building Permit - No Planning	No Conditions
26.08.88	Extension to existing dwelling - addition of living room, kitchen and two bedrooms	Approved Building Permit - No Planning	Standard dwelling conditions relevant to the time
01.02.90	Extension to shed	Approved Building Permit - No Planning	No Conditions
27.07.90	Extension to existing dwelling - addition of a granny flat	Approved Building Permit - No Planning	No Conditions
01.10.92	Addition of Office Building next to existing shed	Approved Building Permit - No Planning	Standard Conditions
22.04.94	Addition to existing workshop	Approved Building Permit - No Planning	No Conditions
12.08.94	Construct a demonstration garage	Approved Building Permit - No Planning	No Conditions
11.10.96	Donga for Office	Approved Building Permit - No Planning	No Conditions
27.06.02	New Shed to house courier company and transport depot	Planning Approval Granted	<ul style="list-style-type: none"> a. No signs being erected without the written consent of Council; b. The business activities of the transport depot are limited to the building and curtilage identified on the plan dated 15 April 2002; c. The approval being valid until 21 June 2004; d. If the development, the subject of this approval, is not substantially commenced within a period of twelve months from the date of the approval, the approval shall lapse and be of no further effect. Where an approval has lapsed, no further development shall be carried out within the further approval of Council having first been sought and obtained; e. Failure to comply with any of the above conditions will render this approval null and void.

07.11.02	Rural Service Industry	Planning Approval	<ol style="list-style-type: none"> 1. Grant planning consent for a rural service industry (shed manufacture) at Lot 5 Great Northern Highway, Muchea, subject to: <ol style="list-style-type: none"> a. No goods or materials being stored, either temporarily or permanently, in the parking or landscape areas or within access driveways. All goods and materials are to be stored within the buildings or service courts, where provided; b. Development shall generally occur in accordance with the plans dated 2 October 2002 submitted for planning consent (Planning application 71/02); c. Breach of conditions may result in cancellation of this approval. 2. Grant planning consent for a new 960m² shed at Lot 5 Great Northern Highway, Muchea, subject to: <ol style="list-style-type: none"> a. Stormwater to be collected in a rainwater tank; b. Development shall generally occur in accordance with the plans dated 2 October 2002 submitted for planning consent (planning application 71/02); c. If the development, the subject of this approval, is not substantially commenced within a period of twelve months from the date of the approval, the approval shall lapse and be of no further effect. Where an approval has lapsed, no further development shall be carried out without the further approval of Council having first been sought and obtained; d. Breach of conditions may result in cancellation of this approval.
05.12.02	Addition of a carport at front of existing shed	Approved Building Permit - No Planning	No Conditions
12.12.02	Extension to existing shed - 1,392m ²	Approved Building Permit - No Planning	No Conditions - Unable to locate Building Permit document
13.12.02	Relocate existing carports	Approved Building Permit - No Planning	No Conditions
21.08.08	Additional stand alone office building	Planning Approval	All buildings and structures shall be within the setback requirements/building envelope.
13.08.10	Office Building	Building Permit	General commercial conditions
22.06.11	Modification to Existing Industry Rural	Planning Approval	<ol style="list-style-type: none"> 1. This approval, in addition to existing approval (P071/02 13.11.02 shall be only for: <ol style="list-style-type: none"> a. The manufacture of sheds and/or shed kit homes; b. The manufacture of structural framework additions and similar to

			<p>existing habitable buildings;</p> <ol style="list-style-type: none"> 2. Temporary storage on site shall only be for products manufactured on site and other associated pre-fabricated materials as per condition 1; 3. Temporary storage shall only be to the rear of the manufacturing shed as shown on the approved plans and shall be drained and maintained on site; 4. Temporary storage area to the rear of the manufacturing shed as shown on the approved plans shall be screened from public view with indigenous plant species to the satisfaction of the Chief Executive Officer; 5. Temporary storage area to the rear of the manufacturing shed as shown on the approved plans shall be setback a minimum 10m from the creek line; 6. Temporary storage shall be within the permitted setback requirements as per the approved plans; 7. Open air display, in conjunction with approval as per conditions 1, shall only be permitted at the front of the existing shed within the prescribed setback area to the highway and shall require prior approval from Main Roads WA and a copy of this evidence provided to Council; 8. Associated transport and freight operations incidental to the predominant landuse shall be permitted; 9. Transport Depot use is not permitted under this approval; 10. Any amendment or variation to this approval and/or the existing approval shall require prior Council approval.
13.09.11	Modified (22.06.11)	Approval Planning Approval	<ol style="list-style-type: none"> 1. This approval, in addition to existing approval (P071/02 13.11.02 shall be only for: <ol style="list-style-type: none"> c. The manufacture of sheds and/or shed kit homes; d. The manufacture of structural framework additions and similar to existing habitable buildings; 2. Temporary storage on site shall only be for products manufactured on site and other associated pre-fabricated materials as per condition 1; 3. Temporary storage shall only be to the rear of the manufacturing shed as shown on the approved plans and shall be drained and maintained on site; 4. Temporary storage area to the rear of the manufacturing shed as shown on the approved plans shall be screened from public view with

			<p>indigenous plant species to the satisfaction of the Chief Executive Officer;</p> <p>5. Temporary storage area to the rear of the manufacturing shed as shown on the approved plans shall be setback a minimum 10m from the creek line;</p> <p>6. Temporary storage shall be within the permitted setback requirements as per the approved plans;</p> <p>7. Open air display, in conjunction with approval as per conditions 1, shall only be permitted at the front of the existing shed within the prescribed setback area to the highway and shall require prior approval from Main Roads WA and a copy of this evidence provided to Council;</p> <p>8. Associated transport and freight operations incidental to the predominant landuse shall be permitted within the area identified on the approved plans (dated 13.08.11);</p> <p>9. Transport Depot use is not permitted under this approval;</p> <p>10. Any amendment or variation to this approval and/or the existing approval shall require prior Council approval.</p>
25.10.11	Signage	Planning Approval	<p>1. The sign shall be located a minimum 1m from the front boundary.</p> <p>2. The sign shall not be illuminated.</p> <p>3. The sign shall be constructed in accordance with the submitted details.</p> <p>4. Any variation to the sign will require prior Council approval.</p>
17.10.12	Extension to shed	Planning Approval	<p>1. Approve the shed extension at Lot 5 (3571) Great Northern Highway, Muchea subject to the following conditions:</p> <ol style="list-style-type: none"> The applicant submit a Scheme Amendment for rezoning for the development and operations on the property within three (3) months of the date of this approval; The shed shall be setback a minimum 30m as per Local Planning Policy No 18 in accordance with the approved plans; The roofing of the shed shall match existing materials; That the stormwater management plan be submitted to Council to the satisfaction of the Chief Executive Officer; The shed shall not be used for residential habitation; The existing screening trees on the northern side boundary shall not be removed unless required so under Clause 5.8.8 of Town Planning Scheme No 6.

			2. Refuse the expansion to the laydown area at Lot 5 (3571) Great Northern Highway, Muchea until such time as a Scheme Amendment to rezone the subject property is granted final adoption.
15.11.13	Amendment No 50	Additional Landuse 17 - Industry-General and Builders Storage Yard	<ol style="list-style-type: none"> 1. Industry-General shall be limited to: <ul style="list-style-type: none"> • The manufacture of transportable buildings; • The assembly of transportable buildings; • The storage of transportable buildings; and • The transportation of transportable buildings. 2. All development, including a single house, is subject to development approval. 3. A stormwater management plan prepared to the satisfaction of local government, in consultation with Department of Water, is required prior to development approval and is to be implemented as a condition of approval.
06.02.14	Extension to Shed	Building Permit Issued	Standard industrial/commercial conditions
15.06.16	Signage for AMS	Planning Approval Issued	<p>That Council approve the application for a temporary period of two (2) years for two (2) proposed Pylon Signs (2m x 4m each) on Lot 5 (3571) Great Northern Highway, Muchea subject to:</p> <ol style="list-style-type: none"> 1. The development is to be in accordance with the approved plans. 2. The applicant is to construct the pylon signs including frame and sign from a frangible material. 3. The applicant indemnifies Main Roads WA against any compensation claim arising from the installation of the above signage. 4. The applicant indemnifies the Shire of Chittering against any compensation arising from the installation of the sign and any other compensation associated with the sign after installation.

History Lot 802 (previously Lot 6)

Date	Proposal	Approved/Refused	Conditions
25.03.15	Hardstand	Planning Approval Issued	<ol style="list-style-type: none"> 1. Prior to commencing the development of the hardstand, the Applicant shall prepare a Catchment Management Plan dealing with: <ol style="list-style-type: none"> a. Stormwater management; b. Protection and monitoring of groundwater; c. Protection and management of waterways; d. Any other relevant matters consider by the Shire; to the satisfaction of the Chief Executive Officer.

			<ol style="list-style-type: none"> 2. Prior to commencing the development of the hardstand, the Applicant shall prepare a Landscaping Management Plan for: <ol style="list-style-type: none"> a. Visual vegetation screening; b. Planting of drainage lines/swales and areas identified; c. Types of indigenous plant species to be planted; d. Planting regime; e. Maintenance of plants; f. Any other relevant matters consider by the Shire; 3. All development shall be setback a minimum 10m from proposed and existing drainage swales/channels and 50m from the Ellen Brook. 4. No permanent building structures shall be permitted within 100m of Great Northern Highway. 5. No development or use of the land the subject of this approval shall be permitted within the identified Perth to Darwin Highway as delineated by Main Roads WA and the Loop Road identified in the MENSP (Attached Figure 8 of Muchea Employment Node Structure Plan). 6. Fill material for the hardstand shall be dieback and contaminant (including asbestos) free. 7. Access to the hardstand shall be subject to the approval of Main Roads WA of which a copy shall be submitted to the Shire. 8. Dust emissions shall be mitigated on site so as to not exit the property boundaries. 9. The Applicant shall comply with the approved Catchment Management Plan at all times. 10. The Applicant shall comply with the approved Landscaping Management Plan at all times. 11. Existing trees shall not be removed unless dead, diseased or required for fire management purposes. 12. Hardstand shall only be used for the purpose of the Additional Uses approved on the land. 13. Storage of hydrocarbons shall require the prior consent of the Shire. <p>Advice Note</p> <ol style="list-style-type: none"> 1. No development or works the subject of this approval shall commence until Condition 1 and 2 of this approval are completed to the satisfaction of the Shire. This includes the delivery/storage of fill product for the hardstand.
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			<ol style="list-style-type: none">2. In relation to Condition 1, the Shire will liaise with the Ellen Brockman Integrated Catchment Group/Chittering Landcare and the Department of Water for advice/approval.3. In relation to Condition 2, the Shire will liaise with the Ellen Brockman Integrated Catchment Group/Chittering Landcare and the Department of Planning for appropriate planting.4. In relation to Condition 5, development includes hardstand and the use of land for storage of building materials, temporary storage of transportable buildings and parking of commercial vehicles as per the Additional Uses approved on the property.
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Government of **Western Australia**
Department of **Planning**

Your ref: Addressee's Ref
Our ref: DP-11-01176/2
Enquiries: Ryan Shaw [REDACTED]

Mr Scott Vincent
Senior Planner
Planning Solutions
GPO Box 2709
CLOISTERS SQUARE PO 6850

Transmitted by email only to: scott.vincent@planningsolutions.com.au

Dear Scott

**LOTS 802 AND 803 (FORMERLY LOT 5 & 6) GREAT NORTHERN HIGHWAY,
MUCHEA – ADVICE ON PLANNING ARRANGEMENTS**

Thank you for your enquiry of 17 November 2016 regarding a suitable planning approach for the above land. The information is provided as general advice in keeping with Section 14(d) of the *Planning and Development Act 2005*.

The information you provided to the Department has been reviewed, along with a compliance report provided by the Shire, the documentation associated with Amendment 50 that created the additional use and the provisions of the Shire's Town Planning Scheme No. 6 (Scheme). Based on the information provided, it is concluded that:

1. The manufacture, assembly, storage and transportation of transportable buildings are uses permitted under the site's 'Additional Use 17' ('A17').
2. The hardstand area on former Lot 6 is consistent with the development application approved on 22 May 2015.
3. The use and maintenance of skip bins could be incidental to the predominant land use, which is the manufacture and assembly of transportable buildings. However, the Department has not viewed the development approval issued, which may or may not have made provision for a specific part of the site.
4. The outstanding issue is the storage of mining-related equipment on site. This issue is discussed in the following paragraphs.

The Minister for Planning has recently determined Amendment 62 to the Scheme, which converts the Scheme into the new format provided for in the *Planning and Development (Local Planning Schemes) Regulations 2015*. Some of the changes in the amendment relate to definitions, including deleting 'storage' from the Zoning Table and adding the new 'model' definition for 'warehouse / storage'.

The definition for 'warehouse / storage' provides for the '*indoor or outdoor storage of goods, equipment, plant or materials*', which seems to be the land use that most closely aligns with storage of mining equipment. Gazettal of Amendment 62 (which is expected to occur shortly) provides Council with the discretion to approve the outdoor storage of mining-related equipment on the site.

While it is likely that land in Precinct 3 of the *Muchea Employment Node Structure Plan* (MENSP) will eventually convert to industrial zoning, most lots in Precinct 3 need to undertake structure planning at, or near zoning stage in order to make provision for the planned service road shown in Figure 8 of the MENSP. In contemplating a 'spot' rezoning for Lots 802 and 803, the ability to develop the estate in a co-ordinated manner would be critical. Proceeding to industrial zoning in an ad-hoc manner may prejudice the orderly and proper planning of the MENSP.

As the storage of mining equipment is capable of being approved under the existing zoning, a development application seems to represent the most time-effective and simple approach to resolving the compliance issue.

Thank you for raising this matter with me. I hope the information set out in this letter is of assistance. If you would like to discuss further with an officer at the Department, please contact Ryan Shaw in the Wheatbelt Team on [REDACTED].

Yours sincerely

[REDACTED]

Cath Meaghan
Director - Wheatbelt Region

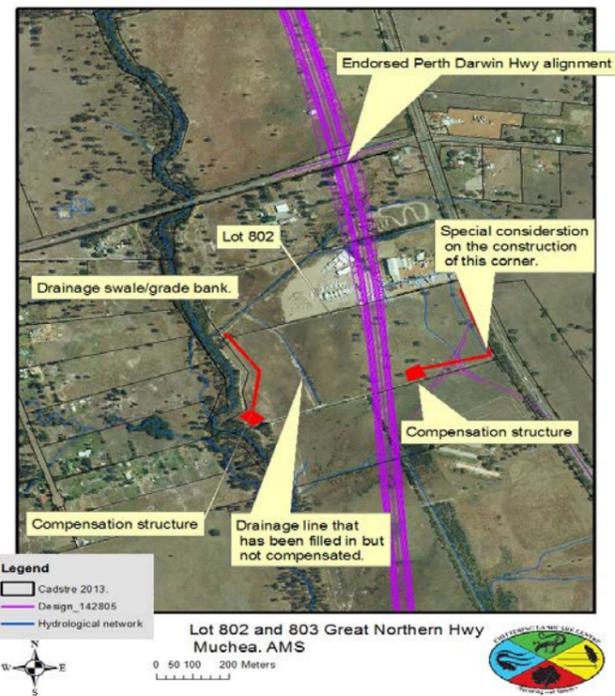
2 December 2016

Agency Submissions			
Submitter	Comment	Proponent Response	Shire Officer Response
1. Department of Water	<p>Thank you for the above referral dated 20 April 2017. The Department of Water (DoW) has assessed the referral and has the following comments to provide.</p> <p>The DoW acknowledges the Water Management Plan prepared by Strategen for Planning Solutions dated February 2017. The DoW has conducted a preliminary review of the plan and will conduct a comprehensive assessment and provide detailed comments in due course.</p> <p>The DoW notes that some of the drains on the site are to be removed. As the proposal is located within the Swan River Surface Water Area; proclaimed under the Rights in Water and Irrigation Act 1914, there may be a requirement to obtain a permit to interfere with the bed and banks of a water course. The issue of a permit is not guaranteed but if issued will contain a number of conditions. The proponent is encouraged to contact the DoW Swan Avon Region office on 6250 8000 to discuss water management options.</p> <p>Therefore, the DoW recommends that the approval of the Water Management Plan be a condition of the development application approval.</p>	<p>The application seeks planning approval for a <u>retrospective change of use, with no works component</u>. Any physical works previously or currently being undertaken on site (i.e. hardstand and/or drainage infrastructure) are associated with the previous planning approvals for the land and are not within the scope of this application.</p> <p>The environmental and water management reporting submitted with the planning application demonstrate that the proposed change of use (i.e. the storage of different items on top of the previously approved hardstand area) is appropriate having regard for best practice management measures. There are no physical works proposed or required in support of the proposed <u>change of use</u>.</p> <p>The Strategen reporting does provide further recommendations and guidance to inform any future applications for works on the subject site (e.g. additional drainage works required/arising from implementation of the Perth-Darwin Highway). Any additional water management plan approvals would be appropriately required at such future time, and not as part of this change of use application.</p>	<p>Additional information was received from DoW which has been included below. Whilst it is considered that conditional approval may be issued for the eastern portion of the property, it is considered that further in depth investigation is required regarding potential landuse impacts to the ground water, storm water and Ellen Brook prior to allowing any additional landuses to occur in the western portion.</p> <p>More water management is required in terms of filtration systems, drainage basins and drainage swales prior to any additional landuses being considered.</p> <p>It is recommended to conditionally approve additional landuses on the eastern portion of the property only and relocate any existing or proposed additional landuses from the western portion of the property to the eastern portion.</p>
2. Chittering Landcare Centre	<p>The Ellen Brockman Integrated Catchment Group, in association with the Chittering Valley Landcare Group, consider that the following points need to be noted in your deliberations for retrospective approval of the above drainage development.</p> <ol style="list-style-type: none"> 1. The original drainage lines on the property were constructed along the contour lines of which the most western drain has been filled with rubble hardstand. These would have been constructed to control any sheet flooding across the property. To expect one swale along the eastern most boundary to control all the water flowing onto the property and flow around a 90 degree curve will be inadequate. 2. It is noted that none of the construction of the swales are to be completed until one year after the highway has been constructed. This could be at least two years. Water control measures need to be installed as soon as possible. 3. A retention basin needs to be installed on the eastern side of the new highway footprint along the southern boundary. This will act as a sediment trap that can be maintained. 4. The construction of the swale at the south eastern corner needs to be designed to avoid erosion and and/or water movement onto the southern property that adjoins Lot 802. 	<p>The application seeks planning approval for a <u>retrospective change of use, with no works component</u>. Any physical works previously or currently being undertaken on site (i.e. hardstand and/or drainage infrastructure) are associated with the previous planning approvals for the land and not within the scope of this application.</p> <p>The environmental and water management reporting submitted with the planning application demonstrate that the proposed change of use (i.e. the storage of different items on top of the previously approved hardstand area) is appropriate having regard for best practice management measures. There are no physical works proposed or required in support of the proposed <u>change of use</u>.</p> <p>The Strategen reporting does provide further recommendations and guidance to inform any future applications for works on the subject site (e.g. additional drainage works required/arising from implementation of the Perth-Darwin Highway). The drainage works recommendations of Chittering Landcare Centre could potentially be required at such future time, and not as part of this change of use application.</p>	<p>It is considered that further investigation is required into the impacts of additional landuses in the western portion of the property prior to any approvals being issued. This will include the demonstration of adequate filtration design, location and design of drainage basins and swales and any other necessary water management techniques and infrastructure.</p> <p>It is recommended to conditionally approve additional landuses on the eastern portion of the property only and relocate any existing or proposed additional landuses from the western portion of the property to the eastern portion.</p>

5. A swale (grade bank) needs to be constructed along the western edge of the hardstand from the northern drainage creek to the south west corner of the property and a retention basin built in the south western corner to allow limited direct flow into the Ellen Brook. This swale should compensate for the drainage line that has been filled in by rubble. This swale will also capture any contaminants or contaminated water that may flow from the storage area and prevent its direct entry to the Ellen Brook.
6. The northern creek that flows to the Ellen Brook is to be revegetated either side for a minimum of 5 metres from the bank.

Some of the species of plants listed would not be suitable for growing along the drainage lines. Chittering Landcare will prepare a list for them if they wish.

The primary objective is to ensure that the water entering the Ellen Brook is of the same or better quality. Hence the Sampling Analysis Plan must reflected this comparison.



3. Main Roads WA
In reference to your correspondence of the 20 April 2017 with attachments, Main Roads WA (MRWA) has determined from the information provided that the application for retrospective planning approval supported subject to compliance with MRWA control of access

The submitter's comments are noted.

Until such time as a physical legal point of access is created or can be demonstrated to be already existing for the western portions of the property, it is considered appropriate to refuse any additional landuses on the western portion of the property.

	<p>requirements for the future Great Northern Highway corridor, specifically Northlink Project.</p> <p>MRWA can confirm that the officially endorsed corridor for Northlink severs both lots 802 and 803.</p> <p>MRWA is still working through the compensation issues with the owners. Attached are the concept plans showing the site boundary and alternative access from existing Brand Highway to the severed part of lots 802 and 803.</p> <p>The lots east of the new highway will continue to be access from Great Northern Highway and the applicant will be required to make suitable arrangements with MRWA for the upgrading of the vehicle crossover along Great Northern Highway servicing Lot 802. (Attachments 1 and 2)</p>		<p>It is recommended to conditionally approve additional landuses on the eastern portion of the property only and relocate any existing or proposed additional landuses from the western portion of the property to the eastern portion.</p>
<p>4. Department of Water</p>	<p><i>Thank you for the above referral received on 20 April 2017. The Department of Water (DoW) has comprehensively assessed the associated Water Management Strategy (WMS) prepared by Strategen for Planning Solutions, dated February 2017 and has the following comments to provide:</i></p> <p><i>The DoW notes that the development application report states that "This application is supported by a water management strategy addressing the sustainable management of water flows on and off the site." However the best management practices outlined in the WMS are yet to be endorsed or implemented, the DoW therefore recommends the following development approval conditions;</i></p> <ul style="list-style-type: none"> • <i>A Water Management Plan is to be prepared and approved in consultation with the Department of Water.</i> • <i>The approved Water Management Plan shall be implemented by the landowner within an agreed timeframe (considering it is a retrospective approval and on- ground works have commenced).</i> <p><i>The DoW considers that the stormwater management practices being implemented at the site currently are not acceptable and therefore the DoW recommends a stronger commitment to implement the proposed stormwater management strategies in a revised WMS for the site. The following outstanding issues and specific comments should be addressed in a revised WMS to be submitted for further assessment:</i></p> <p><i>Executive Summary</i></p> <ul style="list-style-type: none"> • <i>The executive summary should be amended in line with response to comments below.</i> <p><i>Section 2. Existing environment – 2.3 Soils</i></p> <ul style="list-style-type: none"> • <i>Please note that the DoW were not referred the approved</i> 		<p>In light of this submission, and the lack of adequate water management plans from the landowner/applicant, it is considered necessary to only conditionally approve additional landuses on the eastern portion of the property where impacts to the water source are considered to be less.</p> <p>Upon further investigations of the western portion of the property, it may be possible, at some point in the future, to allow additional landuses on the western portion, however, until those investigations are complete, no additional landuses be approved for the western portion.</p> <p>It is recommended to conditionally approve additional landuses on the eastern portion of the property only and relocate any existing or proposed additional landuses from the western portion of the property to the eastern portion.</p>

	<p><i>development application and previous Stormwater Management Plan (SMP) in Figure 3. The SMP does not depict the two existing drains on this lot.</i></p> <p><i>Section 2. Existing environment - 2.4 Groundwater and surface water</i></p> <ul style="list-style-type: none"> • <i>The DoW requires additional information regarding the biophysical conditions (i.e. vegetation, channel, slope, flow etc.) of the waterway (tributary to Ellen Brook) and existing drains on site.</i> • <i>The site is located within the Swan River Surface Water Area, proclaimed under the Rights in Water and Irrigation Act 1914 therefore a permit may be required to fill in or modify mapped waterways and drains on site.</i> • <i>Please provide information on groundwater and surface water quality.</i> • <i>Provide a surface water plan to depict existing / current surface water catchments, waterways (and their foreshore reserves) and drainage, flow directions and rates etc.</i> • <i>Provide a groundwater plan to depict maximum groundwater levels, topography, finished floor levels of the existing hardstand / semi-permeable paving (SPP), groundwater bores etc.</i> <p><i>Section 3. Activities undertaken on the site</i></p> <ul style="list-style-type: none"> • <i>Please provide an overall development concept plan depicting existing and future activities on the site e.g. location of SPP / hardstand areas, main activities, buildings/ workshops, fuel and chemical storage, groundwater bore, rainwater tanks, ablutions, MRWA Northlink reservation, waterways / drains and their foreshores / buffers, stormwater management, oil separator etc.</i> <p><i>Section 5. Water management design - 5.2 Finished levels</i></p> <ul style="list-style-type: none"> • <i>The proposed use of the SPP / fill may be inadequate to manage the high groundwater levels at the site. The waterlogging / flood prone nature of the site and drains that cut into the natural soil, exposes the watertable / groundwater and may therefore increase the risk of pollution to the resource. The depth and nature of the fill may also be inadequate to treat pollutants from entering the groundwater. Please clarify and amend if necessary, the management of groundwater levels and pollution controls.</i> <p><i>Section 5. Water management design - 5.3 Stormwater management</i></p> <ul style="list-style-type: none"> • <i>Refer to previous comment regarding exposure of groundwater. The DoW do not support a 1:3 slope swale that intercepts</i> 		
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	<p><i>groundwater. It is not clear as to whether this swale has already been constructed or is proposed to be constructed or modified. Please clarify and amend.</i></p> <ul style="list-style-type: none"> <i>Provide separate 1 and 100 year event proposed stormwater management plans for both Lots (Figure 3 only shows Lot 802) depicting proposed catchments, stormwater management/treatment areas and flood storage locations, indicative sizing, flow paths and rates etc.</i> <i>Provide designs (plans, cross sections and long sections) for proposed stormwater storage structures. As per above comment, show swale / basin locations and discharge points and rates in the stormwater event plans.</i> <i>The DoW recommends that existing waterways and drains are maintained and rehabilitated into naturalised 'living' streams or swales.</i> <i>The DoW is concerned that the grade and semi-permeable nature of the SPP / hardstand areas, means that untreated stormwater will pond and infiltrate into the groundwater, rather than flow to the treatment and storage swales/basins. The DoW recommends that a more impermeable surface treatment such as crushed limestone, gravel or bitumen is used and graded towards treatment and storage structures.</i> <i>Additional structural controls such as GPTs, sediment / petrol and oil traps should be considered at drain entry points. Treatment of hydrocarbons should be proposed for all hardstand areas (which have the potential for fuel, oil and grease contamination, such as from storage of mining equipment/vehicles and building manufacture) not just the proposed refuelling point.</i> <i>Has an adequate buffer from the development and the Ellen Brook foreshore reserve been established and how can it be managed to protect the waterway and its foreshore, e.g. is a revegetated buffer proposed?</i> <p><i>Section 6. Stormwater operational management - 6.2 Management actions</i></p> <ul style="list-style-type: none"> <i>The DoW understands that duplication of information in supporting reports is to be minimised, however please summarise the key actions for fuel and chemical management that affect stormwater quality in Table 5.</i> <i>Proposed stormwater management swales and basins should be implemented for the site as soon as practical following the endorsement of the WMS. Immediately for the existing SPP and in conjunction with the construction of the remaining approved SPP</i> 		
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	<p><i>and future Northlink / Perth Darwin Highway.</i></p> <p><i>Section 6. Stormwater operational management - 6.3 Monitoring and reporting/Contingency measures</i></p> <ul style="list-style-type: none"> <i>In regards to the contingency measure triggers, please define or quantify 'significantly'. Considering monitoring is proposed for only two events per year, the DoW recommends that if a single event exceeds the agreed trigger, then resample to ensure not an abnormality/error and then if still exceeds trigger implement contingency actions.</i> <p><i>Once the above issues have been addressed, please submit the amended WMS to the DoW (refer to Water Online information below). The revised document is to be submitted along with a summary sheet outlining how and where the comments/issues above are amended in the document.</i></p>		
Public Submissions			
<p>1.</p>	<p>I raise the following issues in relation to the current use, existing and proposed hardstand:</p> <ol style="list-style-type: none"> No storm water drainage infrastructure whatsoever has been installed on this site. Currently, any stormwater that runs off this site enters, unfiltered, into the Ellen Brook. Large equipment is being parked with close proximity of the Ellen Brook to which many machines are leaking hydrocarbons and undoubtedly these contaminates are ending up in the Ellen Brook and ground water. Zero prevention measures are in place to prevent such contamination. There is a winter creek that enters the Ellen Brook that runs east/west and runs along the boundary of the hardstand to which the grass is dead at the base of the drain where the drain enters the Ellen Brook. The roadbase that is being imported has a VERY high probability of containing asbestos due to the material being recycled. The dust that is being created from the site is impacting on our property. ZERO consideration has been given to dust suppression on the site. One of the downfalls of recycled concrete is that it creates substantial dust issues. Alarmingly, the dust contains concrete that contains many poisonous chemicals that are harmful to humans. Take a look at the cement bag and read the hazard warnings. <p>Suggested conditions of approval:</p> <ol style="list-style-type: none"> The Chittering Shire appoints an independent consultant to test the existing road base material used on the hard stand area for traces of asbestos. Testing is also to continue whilst further material is imported to site. Dust suppression is mandatory whilst ALL earthworks occur. An independent dust monitoring device is installed on site during 	<p>The issues raised by the submitter are unfounded and unsubstantiated, evidenced as follows:</p> <ul style="list-style-type: none"> The subject site contains stormwater drainage infrastructure, either already in place or being implemented consistent with previous planning approvals issued by the Shire of Chittering. Equipment is parked on existing approved hardstand areas on the subject site. The machines are currently stored no less than 50m away from the Ellen Brook. As previously documented and communicated to the Shire of Chittering, the vehicles are emptied of fluids/hydrocarbons before being stored on site. The machinery/equipment is monitored on a regular basis in accordance with an environmental management plan (including spill management procedures) in place in accordance with industry requirements. As the vehicles are drained of fuel prior to entering the site, the risk of hydrocarbon pollution from stored vehicles is considered to be low. As such, further physical improvements are not considered to be required. The imported road base material is sourced from a site in Bayswater, and is regularly tested to ensure compliance with previous planning approvals, requiring the hardstand to be contaminant (including asbestos) free. Engineering certificates have been provided to the Shire confirming the suitability of the product and the absence of any asbestos and/or other hazardous materials. A water cart is already used on site to manage dust by wetting roadways when trucks deliver material, and otherwise as required, in accordance with previous planning approvals. The retrospective application is supported by environmental and water management reporting, which both demonstrate the subject site can accommodate the proposed activities with appropriate management 	<p>Removing the additional landuses from the western portion of the property will alleviate all concerns in relation to impacts to the Ellen Brook and the catchment area.</p> <p>Further investigations will be required in relation to any application for additional landuses.</p> <p>It is recommended to conditionally approve additional landuses on the eastern portion of the property only and relocate any existing or proposed additional landuses from the western portion of the property to the eastern portion.</p>

	<p>the summer months.</p> <ol style="list-style-type: none"> 4. The entire hardstand is sealed with a two coat seal or asphalts. Whilst the site is currently constructed with recycled concrete, the ground is porous thus reducing the ability to control contamination. 5. Landcare is engaged to monitor pollution of the Ellen Brook in the vicinity of the property and importantly, the winter creek that enters the Ellen Brook directly behind this site. 6. A comprehensive drainage plan is designed and implemented to the site, paying particular attention to hydrocarbon retention. 7. A hydrocarbon retention basin is constructed on site and is to be monitored independently by the Shire. This basin should also be maintained annually with cleaning and removing waste off site. 8. The heavy plant is to be no closer than 200 metres from the Ellen Brook. 9. A fauna study is to be undertaken to determine the effect and impact on wildlife in the Ellen Brook. 10. An environmental impact assessment is carried out to determine the effects on the Ellen Brook flood plains. Parts of the hard stand area that is being created on this site in previous years has been under water. The filling of the perimeters of the Ellen Brook to build the handstand has the potential to flood the western side land holdings including our property. 11. A 50 meter wide tree buffer zone is to be constructed between the hard stand and the Ellen Brook. 12. Movement of machinery 7am-4pm. 	<p>measures. These reports have been prepared to provide environmental guidance based on State and local government policy to ensure that the activities on the site do not affect the environment or waterways, consistent with State and local government requirements.</p> <p>The submitter's suggested conditions of planning approval do not reasonably relate to the proposed <u>change of use</u> (with no physical works proposed or required).</p>	
<p>2.</p>	<p>DOES NOT APPROVE THIS PROPOSAL FOR THE REASON BEING</p> <ol style="list-style-type: none"> 1. I consider Dump Trucks and the Storage of DUMP Trucks to be Heavy Industry. 2. The land Owner has been storing them there for some time without approval and without any containment around them. So if any oil is dropped it will run into the Brook. 3. The Land Owner has only been given approval for fabricate transportable buildings ONLY and as being a Neighbour I can see a lot of that activity going on, hence the Land Owner has pushed all Boundaries and has decided to take on any extra income and works as he has desired which none of this has been approved. 4. What is the Land Owner trying to change the zoning to as there is no indication ...IE Light Industry, Heavy Industry...and as we can all see from the Highway the Land Owner will do as he pleases !!!!! 5. Why is he allowed to store Containers as that is not part as to my knowledge allowed under there zoning !!!!! Is there any Dangerous goods in any of those Containers ??? As there is Other Land owners that were zoned for the special use of Transport Not allowed to have Containers on their property and yet this Land Owner is allowed to store up to 30 to 50 Containers at a time ???? 6. The outline of this Application for a Change of USE is not very clear and I feel there has to be put into place very strict Guidelines as to not to effect the Environment , The Water ways, Water Usage, Traffic Management , Waste water and where its going and what its effecting. 7. None of the material they have put down into hard stand area has 	<p>The issues raised by the submitter are unfounded and unsubstantiated, evidenced as follows:</p> <ul style="list-style-type: none"> • The retrospective change of use application seeks approval for land uses that are consistent with and capable of approval on the subject site, in accordance with its zoning and additional use classification under the Shire's Local Planning Scheme. • The mining equipment is stored no less than 50m away from the Ellen Brook. As previously documented and communicated to the Shire of Chittering, the vehicles are emptied of fluids/hydrocarbons before being stored on site. The machinery/equipment is monitored on a regular basis in accordance with an environmental management plan (including spill management procedures) in place in accordance with industry requirements. As the vehicles are drained of fuel prior to entering the site, the risk of hydrocarbon pollution from stored vehicles is considered to be low. As such, further physical improvements are not considered to be required. • The retrospective application is supported by environmental and water management reporting, which both demonstrate the subject site can accommodate the proposed activities with appropriate management measures. These reports have been prepared to provide environmental guidance based on State and local government policy to ensure that the activities on the site do not affect the environment or waterways, consistent with State and local government requirements. 	<p>Removing the additional landuses from the western portion of the property will alleviate all concerns in relation to impacts to the Ellen Brook and the catchment area.</p> <p>Further investigations will be required in relation to any application for additional landuses.</p> <p>It is recommended to conditionally approve additional landuses on the eastern portion of the property only and relocate any existing or proposed additional landuses from the western portion of the property to the eastern portion.</p>

<p>been tested for any Dangerous Material ..IE Asbestos.... which should have been tested before laying!!</p> <p>8. All the work the Land Owner has carried out NONE of this has been approved through either The Shire Chittering , Planners or EPA. In saying this I myself have nearly got my Property Rezoned and have spent thousands of dollars in Engineer reports ...Water run off, Water spillage, Water drainage.</p> <p>9. My property has been used for Transport for the last 40 years and at one stage is was a Road Train hook up area before Apple street in Upper swan was made and even to toady I still have to follow Shire guide lines to continue using it, but the Owner of the property we are talking about has moved in and has a “ I do as I please attitude” and seams to be able to get away with it ...THIS HAS GOT TO STOP .</p> <p>10. There has been NO DUST suppression in the area so in the summer when the wind blows me and my adjoining neighbours seem to get all the dust hence in saying that what is mixed in the Hard stand to assure us of NO Dangerous material mixed in with it.</p> <p>11. There is Constant stream of trucks dropping more and more material for Handstand area and why is it that if in Perth all Industrial blocks have to be Concreted and The Land Owners seems to be able to get away with this.</p> <p>QUESTIONS TO ASK</p> <ol style="list-style-type: none"> 1. What has been put in place for containment as the Brook is behind the property. IE....Containment of OIL Spills , Dumping of Oil, Servicing of the Dump Trucks etc. etc. Environmental ISSUE !!! 2. Is the Land owner prepared to concrete a area for the storage of DUMP TRUCKS and put a Oil Bung Contaminate e.g. (Like they put around above open Fuel Tanks) and if so where is the oil and Fuel being stored??? Or is it just going to be Dumped on the ground and then go in the Brook??? 3. How many Dump Trucks , Vehicles and other Large Earthmoving equipment are being stored and again what has been put into place for Containment??? 4. Is the Land Owner going to change access to their driveway to allow extra traffic into these yards. IE Turning Lane 5. I assume with the Perth to Darwin Highway going through the Land owners property does they not have to be a buffer zone in place or does that mean the Land Owner will require more land to make up for the loss of the property. 6. What other Activities is the Land Owner wanting to Expand to, as I can see in the diagram ...Hard stand area...Transport Depot, Builders Storage Yard and Warehouse/Storage Yard... as none of this is explained or outlined clearly as to what the Intentions are for the proposed land <p>My answer to the Shire of Chittering is a definite NO TO THIS APPROVEL for the basic reason as you can see for yourself they will not work with guidelines and not worry about Environmental, Water and Dangerous material being and around the proposed area.</p>	<ul style="list-style-type: none"> • The imported road base material is sourced from a site in Bayswater, and is regularly tested to ensure compliance with previous planning approvals, requiring the hardstand to be contaminant (including asbestos) free. Engineering certificates have been provided to the Shire confirming the suitability of the product and the absence of any asbestos and/or other hazardous materials. • Assertions that on-site works have not been approved are incorrect and unsubstantiated. The hardstand works being implemented on site have been previously approved by the Shire of Chittering. • A water cart is already used on site to manage dust by wetting roadways when trucks deliver material, and otherwise as required, in accordance with previous planning approvals. 	
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<p>3.</p>	<p>I refer to your letter of April 19, 2017 regarding proposed retrospective approval application for a change of use - storage of mining equipment, vehicles and skip bins - Lots 802 and 803 (3571) Great Northern Highway, Muchea.</p> <p>I have no problem at all with the occupiers of Lots 802 and 803 continuing to proceed with their business activities as outlined in your letter.</p>	<p>The submitter's comments are noted and welcomed.</p>	<p>Noted.</p> <p>It is recommended to conditionally approve additional landuses on the eastern portion of the property only and relocate any existing or proposed additional landuses from the western portion of the property to the eastern portion.</p>
<p>4.</p>	<p>In response to your letter received 19 April regarding proposed retrospective approval for storage on Lots 802 and 803 Great Northern Highway, Muchea. Please see below dot point comments on this proposal.</p> <ul style="list-style-type: none"> • Hardstand run off - what environment guide lines are in place to reduce excessive run off into Ellen Brook waterways? • Hardstand materials - what materials have been used? Have these been inspected as its already on the ground. • Buffer zone - near map shows that hardstand is within 10 metres of Ellen Brook boundary shouldn't there be a minimum 100 metre buffer zone. • Revegetation - any requirement to create a green belt to screen off machinery from abutting western side properties. • Skip bins - are these all cleaned with no residual contaminates? • Mining equipment - no oil leaks presume they are parked straight onto hardstand. • Dust Control - white guide lines are in place to reduce dust especially when summer easterlies are blowing? 	<p>The following comments are offered in response to the submitters questions:</p> <ul style="list-style-type: none"> • The management of stormwater drainage volumes and runoff from the hardstand are not the subject of this application. The hardstand has been previously approved by the Shire of Chittering. The application seeks planning approval for a <u>retrospective change of use, with no works component</u>. • The imported road base material is sourced from a site in Bayswater, and is regularly tested to ensure compliance with previous planning approvals, requiring the hardstand to be contaminant (including asbestos) free. Engineering certificates have been provided to the Shire confirming the suitability of the product and the absence of any asbestos and/or other hazardous materials. • The hardstand is being implemented in accordance with previous approvals from the Shire of Chittering. • Properties to the west of the subject site are already visually screened by the existing Ellen Brook vegetated corridor. • Skip bins are cleaned prior to entering the site. • As previously documented and communicated to the Shire of Chittering, the vehicles are emptied of fluids/hydrocarbons before being stored on site. The machinery/equipment is monitored on a regular basis in accordance with an environmental management plan (including spill management procedures) in place in accordance with industry requirements. As the vehicles are drained of fuel prior to entering the site, the risk of hydrocarbon pollution from stored vehicles is considered to be low. As such, further physical improvements are not considered to be required. • A water cart is already used on site to manage dust by wetting roadways when trucks deliver material, and otherwise as required, in accordance with previous planning approvals. 	<p>Removing the additional landuses from the western portion of the property will alleviate all concerns in relation to impacts to the Ellen Brook and the catchment area.</p> <p>Further investigations will be required in relation to any application for additional landuses.</p> <p>It is recommended to conditionally approve additional landuses on the eastern portion of the property only and relocate any existing or proposed additional landuses from the western portion of the property to the eastern portion.</p>

*Note: Comments are as per original submission received by the Shire. Submission comments have not been edited unless for the purposes of confidentiality where necessary.







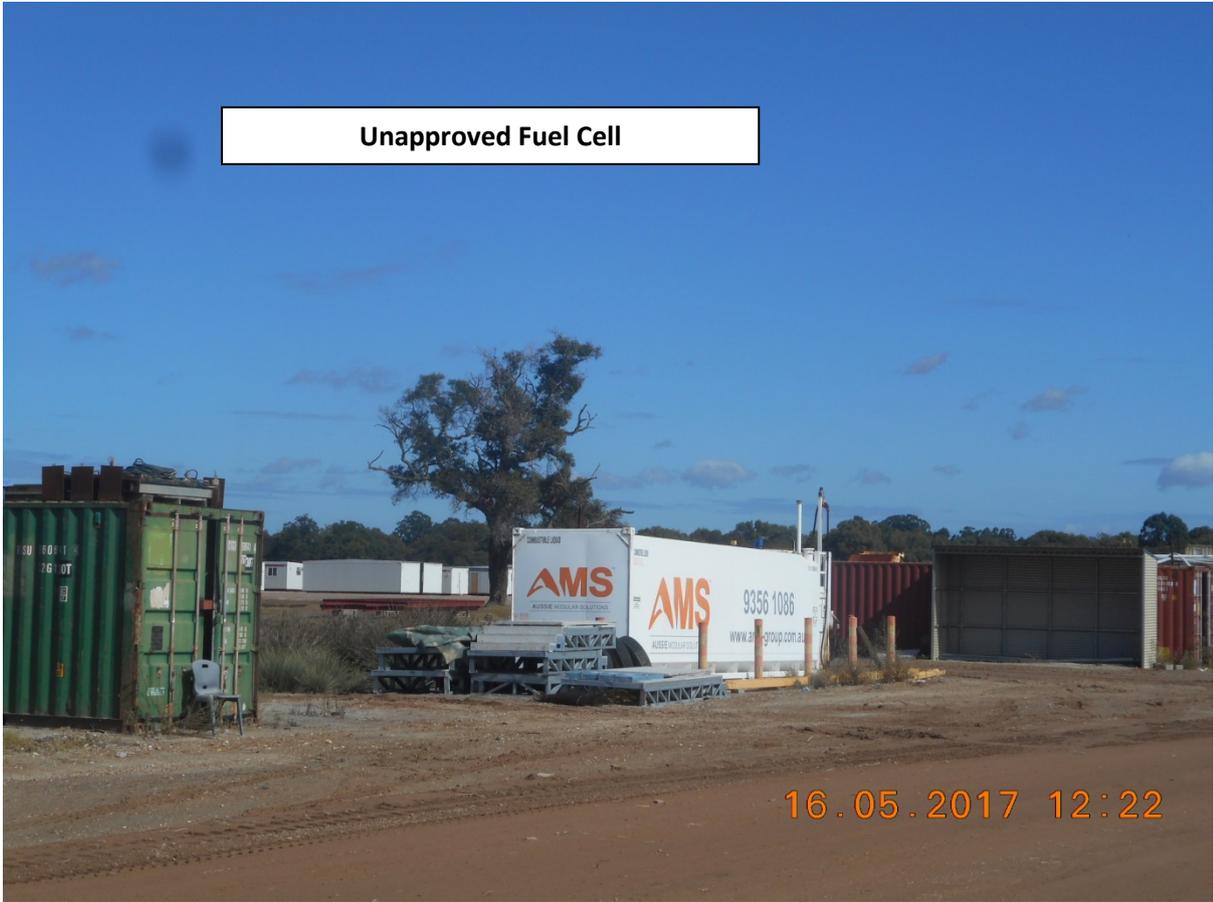
Example of Skip Bins



Example of Skip Bins



Unapproved Fuel Cell



Unapproved Fuel Cell





Ground Surrounding Fuel Cell









EXCAVATION MANAGEMENT PLAN LOT 52 OLD GINGIN ROAD, CHITTERING

1.0 INTRODUCTION

1.1 Development Proposal

It is proposed to complete the extraction of the sand resource at Lot 52 Old Gingin Rd Chittering for use in construction of the Perth Darwin National Highway (Northlink 3) within the Shire of Chittering.

The quality of sand makes it an excellent resource for this need without large disruption or degradation to the environment and minimises negative impacts on traffic and roads.

This site is located at Lot 52 Old Gingin Rd and owned by Temma Nominees Pty Ltd. There is a current approval for excavation at Pits B & C on the property. The most recent approval was in 2015 and is current until 30/6/2018, with an option to extend until 30/6/2024. It is proposed that the current approval be amended to include Pit A and the approval extended to 30/6/2019. This would allow the MRWA contractors to utilise these local resources within the necessary Northlink 3 works time frame.

1.2 Proponent

The property is owned by a company, Temma Nominees Pty Ltd. It is intended that the excavation will continue to be undertaken by the landowner.

1.3 Site Location

Lot 52 Old Gingin Road is located approximately 5km north of the Muchea townsite, between Brand Highway and Great Northern Highway. The site has frontage to the unsealed portion of Old Gingin Road, and an unconstructed access leg to Reserve Road. An unsealed portion of Yalyal Road intersects the northern section of the property. The owner is required to upgrade a portion of Old Gingin Rd as a condition of the approval for excavation at Pit B.

A *Locality Plan* and a *Site Plan* showing the locations of the pits are provided below.

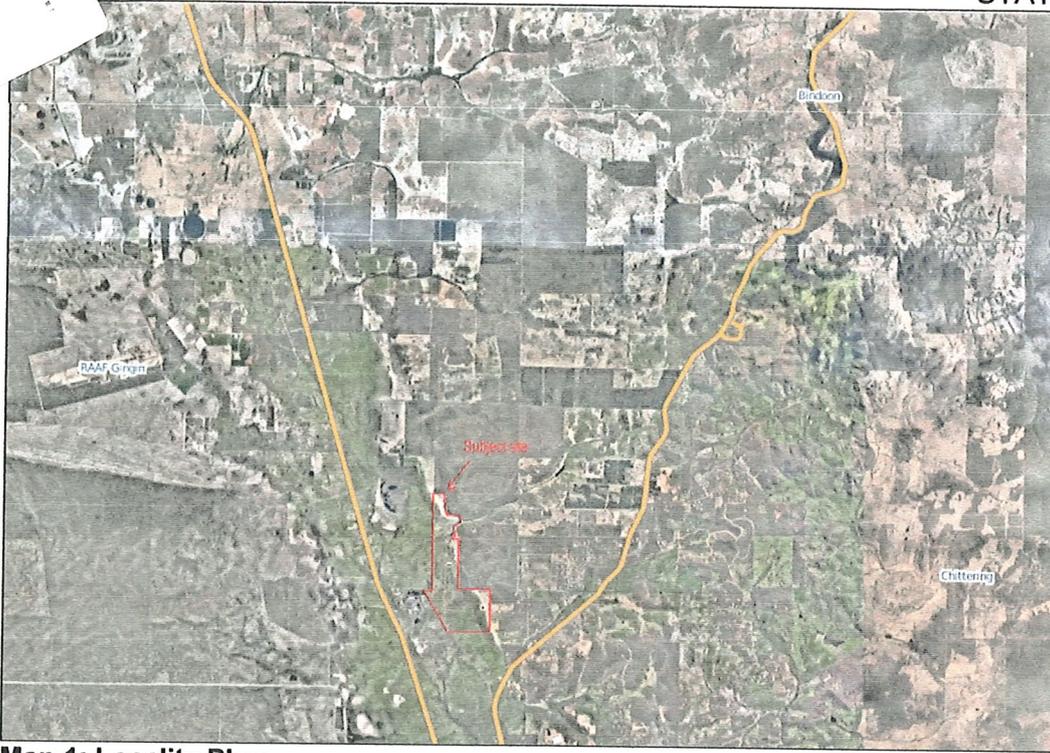
1.4 Title Details, Ownership and Excavation Agreement

Lot 52 is created by Plan 39849, Certificate of Title Volume 229 Folio 41. The property is owned by Temma Nominees Pty Ltd. It is proposed that the excavation will be undertaken by the landowner therefore an excavation agreement is not required.

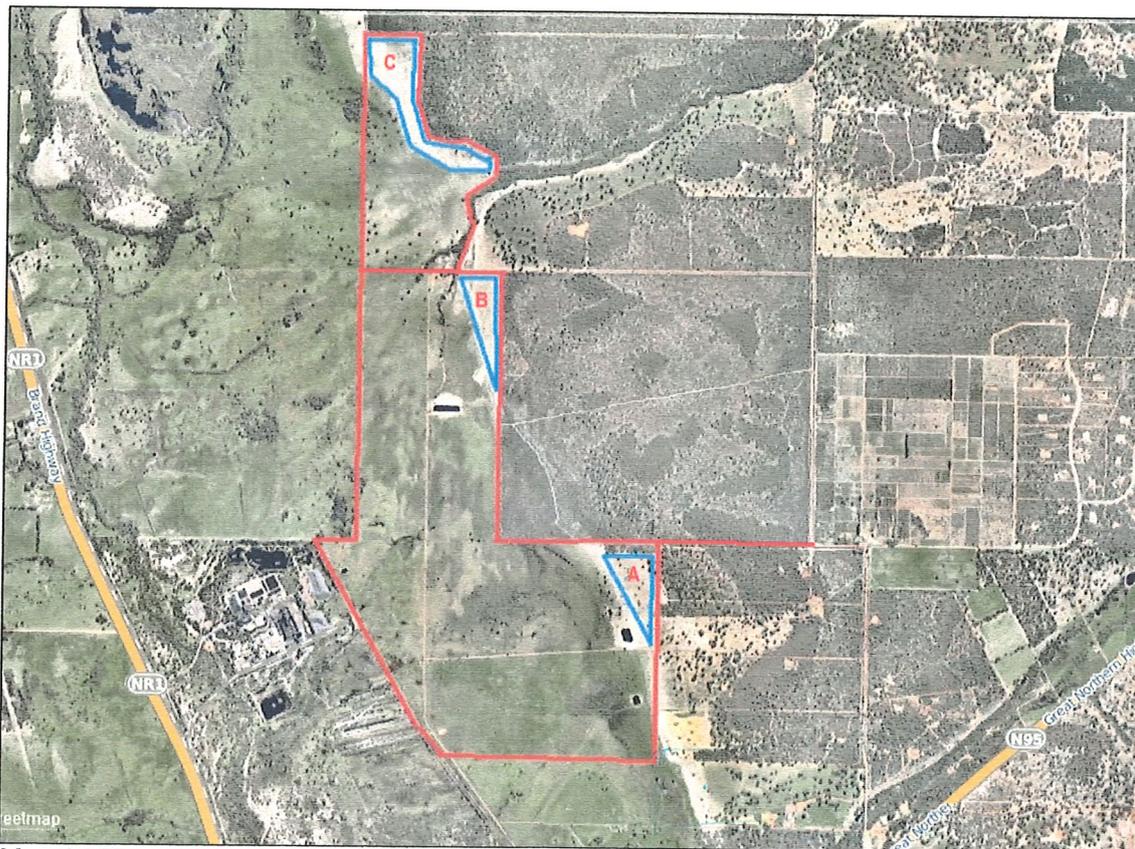
1.5 Description of Resource, size of deposit.

It is proposed to excavate sand resource as shown in Map 2 labelled A. This area is part of the natural sand dune formation of the area and has been historically cleared of natural vegetation.

It is estimated from current surveying there is approximately 1,152,000m³ of sand to be extracted from Pit A. There is a further 500,000 m³ of sand remaining to be extracted from Pit B and it is estimated there is approximately 707,000 m³ to be extracted from Pit C under the current approval.



Map 1: Locality Plan



Map 2: Proposed sand excavation areas

MINING ISSUES2.1 Site and surrounding area land use

Lot 52 Old Gingin Road is rural and has traditionally been used for farm land. The property currently holds 200 breeder cattle. The majority of the property will continue to operate as a cattle property, with the ultimate excavation being confined to three sections of the site.

The adjoining property to the south is also farmland.

Lot 23 Reserve Road adjoins the south east boundary of Lot 52 Old Gingin Road (just south of Pit A). Lot 23 Reserve Road has been mined for sand. We are advised it has recently been decommissioned and rehabilitated.

The western boundary of Lot 52 Old Gingin Road is adjoined with Tiwest mineral sand mine. The northern boundary is adjoined by private land that is bushland.

2.2 Zoning

The land is zoned Agricultural Resource Zone under the Shire of Chittering Town Planning Scheme No 6 (TPS 6). Industry – Extractive is an 'A' land use within this zone, with advertising being required prior to the Shire issuing planning approval.

The Zone objectives of this area are stated as:

- *To preserve productive land suitable for grazing, cropping and intensive horticulture and other compatible productive rural uses in a sustainable manner.*
- *To protect the landform and landscape values of the district against despoliation and land degradation.*
- *To encourage intensive agriculture and associated tourist facilities, where appropriate*
- *To allow for the extraction of basic raw materials where it is environmentally and socially acceptable.*

The flat areas of the subject site will continue to be utilised for livestock grazing, in keeping with the objectives of the zone. The proposed excavation will have limited environmental impacts given the area is already cleared, and is located well away from existing dwellings.

TPS 6 further makes the following statements in relation to Extraction of Raw Materials (cl.5.16):

- *Extraction of essential materials for roads and construction are to be permitted in areas where they will not adversely affect living environments, the landscape quality or contribute to land degradation problems during and after operations.*
- *Extraction of basic raw materials within the rural zones is to be managed in accordance with best industry practice including consideration of end land use and rehabilitation at time of decommissioning.*
- *Appropriate buffer areas are to be applied to protect both the extractive operations as well as the living or agricultural environment in nearby areas.*

The property is included in the Gingin scarp subsection of the Landscape Protection Zone. The prime concern for this area is for the protection of the landform against denudation, water quality (nutrient export) and erosion.

Sand extraction is currently taking place in Pit B in accordance with the 2012/2015 approval. The soil on the property is unsuitable for cropping or farming but the rehabilitation process after extraction onto a firm base will make the ground sustainable for farming.

2.3 Appropriate buffer area

The nearest dwellings are approximately 800m distant (east of Pit A). This exceeds the 300-500m fall back minimum set out in the EPAs guidance statement for Separation Distances between Industrial and Sensitive Land Uses for small scale sand extraction.

2.4 Responsible authorities and approvals

The Shire of Chittering is responsible for granting planning approval for the extractive industry, as well as the excavation licence.

A groundwater licence has been issued by the Department of Water.

2.5 Community consultation

The general use of the property is for cattle grazing. Tiwest is located to the west of the property and to the east side of the property backs on to large private properties that front Reserve Road. Entrance to the excavation sites would be via Old Gingin Road.

Public consultation will be carried out by the Shire as part of the statutory planning application process, and any issues raised as a result of the advertising will be addressed as necessary.

3.0 EXISTING ENVIRONMENT

3.1 Topography and Geology

The site is located on the western edge of the Dandaragan Plateau. The bulk of the site is flat to gently inclined. The area to be excavated is part of the sand dune ridge forming the moderately inclined foot slopes of the plateau. The attached plan details the existing site features and contours.

3.2 Soils

The site is predominantly sand, with the soil sampling concurring that the areas to be extracted consist of coarse sand.

3.3 Hydrology

The north east section of the property is intersected by Yalyal Brook. Rocky Creek flows to the south of the site, and Chandala Brook flows to the west. The site contains three dams, representative of the ground water levels of the site.

3.4 Flora and Fauna

A spring botanical survey of the site was carried out in November 2011 by Bennett Environmental Consulting (copy attached). The survey found that the vegetation within the three areas in which the sand extraction is proposed is degraded. No significant flora exists on the site, and any remnants are too small to be considered for conservation. No significant fauna habitats have been identified on the site. The proposed extraction will therefore have a limited impact on the botanical environment of the locality.

3.5 Aboriginal Sites

The three excavation areas are not affected by any registered Aboriginal Heritage sites.

4.0 EXCAVATION PROGRAMME

4.1 Extent of topsoil removal

Clearing of remnant vegetation is limited as the area is pasture.

Topsoil to a depth of 150mm or as stipulated by Council will be removed from the extraction areas and stored on site for rehabilitation of the site as excavation is progressively carried out. A bund will be created using topsoil to prevent runoff to the wetlands. A maximum of 1 ha will be stripped at any one time.

Note: Necessary clearing permits will be obtained as and when they are required with the Department of Environment Regulation.

4.2 Method of removal

The top soil will be removed using a wheel loader and will be stockpiled on site.

4.3 Area and depth of excavation

The excavation will encroach into the sand dune land formation. The base of the pit will be level with the existing pasture land, with battered banks of 1:3 rising up to the crest of the sand dune.

The area of Pit A subject to excavation will be approximately 7.989 ha with maximum depth of 5m.

4.4 Method of excavation

A wheel loader, excavator and bulldozer will be used to work on site. These machines will be used to excavate the material, maintain the access roads and to assist with the topsoil removal and rehabilitation of the site. We note the requirement for a license under Part V of the Environmental Protection Act 1986 and the operator will take appropriate action before works commence.

There may be a requirement for screening of material on site.

4.5 Staging and timing

Should the MRWA contract be awarded to the interested party it is estimated that the total extraction of all three pits would be completed by December 2018, depending on when they start requiring the sand. To allow for some delays we have requested the approval to extend to 30/6/19.

4.6 Quantity to be removed

The estimated excavation quantity for which this approval is sought is 1,150,000 m³ from Pit A. There is 700,000 m³ from Pit C and a further 500,000 m³ remaining in Pit B under the current approval. There may be a requirement for screening of material.

4.7 Hours of Operation

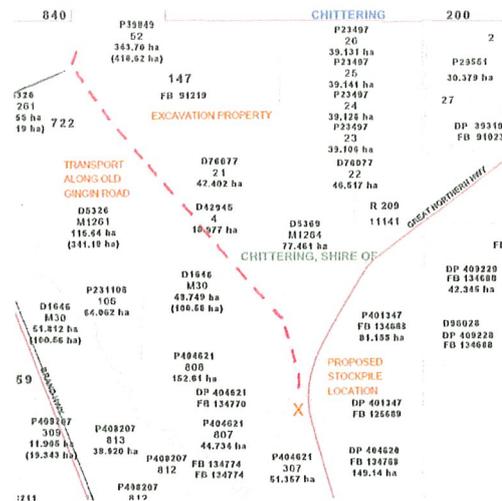
The hours of operation will be limited to 0600 to 1800 hours Monday to Friday and 0730 to 1700 hours on Saturdays in accordance with the Shire of Chittering Extractive Industry Local Law.

4.8 Machinery and Equipment

An articulated four wheel loader and a dust suppression tank will be utilised on site.

4.9 Access and transport

The material leaving the site will be used for road construction for the Northlink 3 project (PDNH) and be hauled onto the northern point of the newly constructed road, via Old Gingin Road without accessing the Great Northern Highway. Map 4 below identifies the route to be used for haulage and the location of the proposed stockpile.



Map 4 – Proposed Haulage Route

4.10 Work Force

The workforce will be wholly local employees; one person will be on site between 2-6 hrs per day.

4.11 Water Use On Site

Dust suppression water will be available from a farm dam on the property. This dam is currently licensed by the landowner, Temma Nominees. A water truck will be used to suppress dust. A Groundwater Licence has been issued by the Department of Water.

4.12 Site Drainage

Existing drainage lines throughout the property will continue to be used to manage overland flow of stormwater.

5.0 Environmental Management

5.1 Aesthetics

The proposed excavation areas are situated in the northern extent and south eastern portion of the property. Pit A is adjoined by private bush blocks to the north and east. Its south western edge is located well within the property, with its nearest common boundary in that direction being with Tiwest. There will be minimal impacts from the excavation operation.

5.2 Noise Management

Noise from the proposed site will not impact on surrounding properties as the closest occupants are further than the 300 metre buffer. The maximum noise level of all equipment is 85Dba at 15 metres.

5.3 Dust Management

A water truck will be utilised for dust suppression when necessary.

5.4 Soil Erosion

In the event of soil erosion on any excavated site, the affected area will be wet down with a water truck if required. Proposed excavation areas that have not had the topsoil removed will not have erosion issues as these areas are pastured.

5.5 Pit Water Management

A bund will be constructed to prevent all rain run-off from entering the wet lands to the west of the site.

5.6 Water Quality

Impact on groundwater, wetlands, watercourses and conservation has been a prime focus of planning for this project. No excavation is proposed below the existing flat ground level of the remainder of the site. It is anticipated that the groundwater throughout the site is consistent with the level of the four dams, the level of which is below the proposed pit levels.

5.7 Flora and Fauna

The only identified fauna are rabbits. The rabbits have grazed in the area but primarily live in the adjoining scrub land to the east. Rabbits are a declared pest. The area has been regularly grazed and no flora is known to the area. The Bennett Environmental report confirms that there is no flora worthy of conservation on the site. The area has been cultivated and seeded in the past but due to poor sand conditions the soil will not sustain good pasture cover. Any rehabilitation that is to occur on site will improve the soil for revegetation.

5.8 Safety

Worksafe standards will be practice on site.

5.9 Fuelling on site

Refuelling of the loader and other machinery, if on site, will occur in an area created for that purpose. The area will have a bund and will be lined to ensure spillage will not enter the water table. Fuel may be stored on site but primarily it will be transported to the site as required in a 300 ltr tank mounted on a light vehicle.

5.10 Dieback and Acid Sulphate Soils

A Dieback and Acid Sulphate Soil assessment was undertaken by Bioscience in August 2011 (copy attached). It was determined that there is no presence of Dieback. The assessment also concluded that the soil is classified as a Non-Acid Sulphate Soil. Therefore disturbance and transporting of the soil profile will not result in any negative impact on the environment.

5.11 Weeds

Ongoing weed control is important to prevent recolonisation of weed species from adjoining areas via animals, water and wind. Weed control will focus on managing weed species that are most abundant at the site and are likely to have established seed stores.

Where germination of weed species is evident, spraying with a herbicide will be undertaken annually.

5.10 Fire management

The site has a very light pasture cover. Any top soil removal will be carried out over the winter months if possible. A light vehicle with a fire unit will be on site as well as the water tanker if required for fires.

DFES currently uses the large dam for fires close by as a water source for helicopter fire fighting.

6.0 REHABILITATION PROGRAMME

6.1 Storage Location of Topsoil

Topsoil will be stockpiled on site within the working area of the pit.

6.2 Method of Topsoil Replacement

The topsoil will be applied using a wheel loader and spread using a grader. The depth of the topsoil will be approximately 100-200mm. Deep ripping will be carried out where the replanting of trees will occur. Contours will be created to contain water to assist with the survival of the new plants and to slow down erosion on site allowing for natural filtration of water.

6.3 Plant Species for Rehabilitation

Types of vegetation to be planted will be all local natives. Tree planting will be done in conjunction with the Chittering Landcare. Involvement with the local Landcare group will ensure that their advice is readily obtainable for suitable plant selection.

Tree planting will be done to a ratio of 1:60 of existing trees that are removed as a result of the excavation works. We note that the areas the subject of this application are cleared and used for grazing. It is intended that the end use will remain as grazing after the sand resource has been removed.

6.4 Landform for End Use

The rehabilitation objectives are that:

- The resultant site will be in better condition than when the project was started; and
- To create a new environment for fauna to move into after the rehabilitation process has been completed.

6.5 Maintenance

At the start of each winter period the site will have the original topsoil reapplied and with deep ripping the land will be planted with Landcare and the land owner.

The new landscape will enhance the trapping of water to prevent erosion and allow for natural filtration of water to the western wetlands.

Rehabilitation will be based on an ongoing process to have a minimum exposure. All topsoil removed and stored from the area will be reapplied to the areas that have been excavated. The new face of the land will be contoured to retain water to the land, minimizing water flow and to prevent possible erosion. Further land preparation such as ripping to assist with tree restoration will be carried out in conjunction with the Ellenbrook Catchment Group.

7.0 MONITORING AND REPORTING

7.1 Elements to be Monitored

There is no evidence of this operation disturbing acid sulphate soils and the area lies within a low risk area. Refer to acid sulphate soil testing results.

Acid sulphate testing will be carried out and presented to the Shire of Chittering as required.

There are no characteristics of or local knowledge to indicate presence of acid sulphate soils. Should there be evidence of acid sulphate soil encountered, the area concerned will be covered and no disturbance made.

7.2 Soil and Water Sampling and Reporting

Ongoing monitoring of the site will be undertaken as required by the Shire's Excavation Licence conditions. It is anticipated that such ongoing monitoring will demonstrate that the excavation has been undertaken in a responsible manner, with no impact on the surrounding environment.

ATTACHMENTS

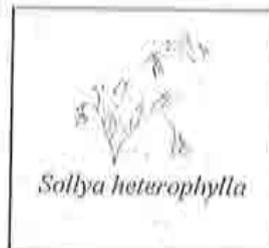
Flora Survey
Acid Sulphate Soil and Dieback Analysis soil sampling

Lot 52 Old Gingin Road, Chittering



Prepared for:
Statewest Surveying and Planning
69 Great Northern Highway
MIDLAND

Prepared by:
Bennett Environmental Consulting Pty Ltd



PO Box 341
KALAMUNDA 6926

November 2011

STATEMENT OF LIMITATIONS

Scope of Services

This report ("the report") has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Eleanor Bennett ("the Author"). In some circumstances a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services.

Reliance on Data

In preparing the report, the Author has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise stated in the report, the Author has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. The Author will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to the Author.

Environmental Conclusions

In accordance with the scope of services, the Author has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

The conclusions are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of preparing the report. Also it should be recognised that site conditions, can change with time.

Within the limitations imposed by the scope of services, the field assessment and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

Report for Benefit of Client

The report has been prepared for the benefit of the Client and no other party. The Author assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of the Author or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

Other Limitations

The Author will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report. The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

INDEX

1. INTRODUCTION	1
1.1 Background	1
1.2 Scope of Works	1
2. BACKGROUND INFORMATION	2
2.1 Geology and Landform	2
2.2 Vegetation	2
3. METHODS	2
3.1 Vegetation	2
3.2 Vegetation Condition	3
4. RESULTS	3
4.1 Vegetation	4
4.2 Significant Flora	17
5. DISCUSSION	19
6. REFERENCES	19

I. INTRODUCTION

I.1 Background

Bennett Environmental Consulting Pty Ltd was commissioned by Statewest Surveying and Planning to undertake a botanical survey of Lot 2 Old Gingin Road, Chittering. The site is between the Great Northern Highway and Brand Highway and is used to graze cattle. It is proposed to utilise three small areas of the property for sand extraction. From the aerial photograph provided the site appeared to be completely cleared but was surrounded on the eastern and northern side by privately owned remnant bushland, by TiWest extraction plant and farmland on the western side, and by farmland to the south.



Diagram 1. Location of site (outlined in red) and the three areas intended for sand extraction (outlined in blue)

I.2 Scope of Works

The requirements for this project were to:

- i. Undertake a Level 1 vegetation survey (Environmental Protection Authority, 2004); and to
- ii. Search for and record all significant species at the site.

2. BACKGROUND INFORMATION

2.1 Geology and Landform

The survey area is included in the Yanga unit which is a poorly drained area characterised by a pattern of flat sandy benches with intervening swamps (Churchward and McArthur, 1980).

2.2 Vegetation

The Interim Biogeographical Regionalisation for Australia (IBRA) (Thackway and Cresswell, 1995) recognizes 85 bioregions. The IBRA is used as the common unit to compare biological and biophysical attributes. Bioregions represent a landscape-based approach to classifying the land surface and each region is defined by a set of major environmental influences, which shape the occurrence of flora and fauna and their interaction with the physical environment. The site occurs in the Swan Coastal Plain, which has been subdivided into the northern section and the southern section. The study area is located in the southern section, abbreviated SWA2 (Mitchell, Williams and Desmond, 2002).

Beard (1981) mapped the site as a mosaic consisting of a Medium Open Woodland of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*), with Low Woodland of *Banksia* species / Medium sparse Woodland of Jarrah and Marri (abbreviated e2,3Mi bLi/e2,3Mp). Shepherd *et al.* (2002) have determined the pre-European and current extent of the vegetation associations described by Beard. In addition they have assessed the percentage of each vegetation association remaining, the amount in IUCN reserves and the percentage in other reserves. The pre-European area of e2,3Mi bLi/e2,3Mp is estimated to be 46,7481ha, the current extent 26,423 which represents 56.5% remaining vegetated of which 30% is included in conservation.

Hedde *et al.* (1980) described the vegetation complexes of the Darling System at a scale of 1:250 000. There was found to be a distinct pattern of plant distribution linked to landforms, soils and climate. The most obvious trend was associated with increasing aridity from west to east on the Darling Plateau. The vegetation changes observed were a decrease in height and percentage cover of the tallest stratum and a distinct change in floristics. The site occurs in the Yanga Complex which is described as predominantly a Closed Scrub of *Melaleuca* species on flats subjected to inundation. On the dried sites (the higher ground) the vegetation reflects that of the Coonambidgee Complex. The Coonambidgee Complex is described as ranging from a Low Open Forest and Low Woodland of *Eucalyptus todtiana*, *Banksia attenuata*, *Banksia menziesii* and *Banksia ilicifolia* to an Open Woodland of *Corymbia calophylla* and *Banksia* species.

Bush Forever (Government of Western Australia, 2000) states that 1% of the original area of the Yanga and 9.4% of the Coonambidgee Complex remain vegetated within the Swan Coastal Plain.

3. METHODS

Transects were walked through the remnant bushland listing the vegetation units in the area and the dominant taxa. Most of the site was assessed at a Level 1 vegetation survey but where an area was of a reasonable size and included good vegetation a quadrat was assessed.

3.1 Vegetation

The vegetation at the site is described using the vegetation classification of Muir (1977) as set out in Table 1.

Table 1. Vegetation Classification (from Muir, 1977)

LIFE FORM / HEIGHT CLASS	Canopy Cover			
	DENSE 70% - 100%	MID DENSE 30% - 70%	SPARSE 10% - 30%	VERY SPARSE 2% - 10%
Trees > 30 m	Dense Tall Forest	Tall Forest	Tall Woodland	Open Tall Woodland
Trees 15 – 30 m	Dense Forest	Forest	Woodland	Open Woodland
Trees 5 – 15 m	Dense Low Forest A	Low Forest A	Low Woodland A	Open Low Woodland A
Trees < 5 m	Dense Low Forest B	Low Forest B	Low Woodland B	Open Low Woodland B
Mallee (tree form)	Dense Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
Mallee (shrub form)	Dense Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
Shrubs > 2 m	Dense Thicket	Thicket	Scrub	Open Scrub
Shrubs 1.5 – 2 m	Dense Heath A	Heath A	Low Scrub A	Open Low Scrub A
Shrubs 1 - 1.5 m	Dense Heath B	Heath B	Low Scrub B	Open Low Scrub B
Shrubs 0.5 – 1 m	Dense Low Heath C	Low Heath C	Dwarf Scrub C	Open Dwarf Scrub C
Shrubs 0 - 0.5 m	Dense Low Heath D	Low Heath D	Dwarf Scrub D	Open Dwarf Scrub D
Mat plants	Dense Mat Plants	Mat Plants	Open Mat Plants	Very Open Mat Plants
Hummock grass	Dense Hummock Grass	Mid-Dense Hummock Grass	Hummock Grass	Open Hummock Grass
Bunch grass > 0.5 m	Dense Tall Grass	Tall Grass	Open Tall Grass	Very Open Tall Grass
Bunch grass < 0.5 m	Dense Low Grass	Low Grass	Open Low Grass	Very Open Low Grass
Herbaceous spp.	Dense Herbs	Herbs	Open Herbs	Very Open Herbs
Sedges > 0.5 m	Dense Tall sedges	Tall Sedges	Open Tall Sedges	Very Open Tall Sedges
Sedges < 0.5 m	Dense Low Sedges	Low Sedges	Open Low Sedges	Very Open Low Sedges
Ferns	Dense Ferns	Ferns	Open Ferns	Very Open Ferns
Mosses, liverworts	Dense Mosses	Mosses	Open Mosses	Very Open Mosses

3.2 Vegetation Condition

Bushland has been historically subject to ongoing degradation and is especially susceptible to disturbances arising as a result of indirect impacts from surrounding developments and human activity. Degradation is caused by a wide range of factors, including isolation, edge effects, weed invasion, plant diseases, changes in fire frequency, landscape fragmentation, increased predation on native fauna by feral animals, decrease in species richness and general modification of ecological function. These issues can affect the biodiversity rating and ecological viability of areas of remnant vegetation and should be assessed in line with conservation values. The vegetation condition was rated according to the vegetation condition scale used in Keighery (1994), see Table 2.

Table 2. Explanation of Vegetation Condition Rating (Keighery, 1994)

Rating	Description	Explanation
1	Pristine	Pristine or nearly so, no obvious signs of disturbance.
2	Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
3	Very Good	Vegetation structure altered, obvious signs of disturbance.
4	Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it.
5	Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management.
6	Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.

4. RESULTS

Field work was undertaken on 18th November 2011. Each of the three areas identified for sand extraction were assessed in detail and the vegetation of the remainder of the site recorded. A level 1 assessment was undertaken for all except GG10 where a quadrat was utilised. The site is utilised to graze cattle and no areas of remnant bushland are fenced off from them. In addition rabbits and kangaroos also graze the areas adjacent to the large area of remnant bushland on other properties to the east.

An * indicates the plant is a weed, a plant in bold indicates it was a dominant species at the site.

4.1 Vegetation

Site GG01 – Northern area proposed for sand extraction

GPS: 402496E; 6514380N

Heath A of *Jacksonia furcellata* over Open Herbs dominated by *Podotheca gnaphaloides* and *Cartonema philydroides* over Open Tall Grass of *Austrostipa flavescens* over Very Open Low Grass of *Pentaschistis airoides* in grey sand.

Vegetation condition - good to degraded.

RECORDED SPECIES

Shrubs: *Acacia huegelii*, *Acacia saligna*, ***Jacksonia furcellata***, **Solanum nigrum*

Herbs: **Arctotheca calendula*, *Calandrinia linifolia*, *Cartonema philydroides*, *Crassula colorata*, *Dianella revoluta* subsp. *divaricata*, **Erodium botrys*, **Hypochaeris glabra*, **Lachnagrostis aemula*, **Lotus subbiflorus*, **Ornithopus sativus*, **Orobanche australis*, ***Podotheca gnaphaloides***, *Trachymene pilosa*, **Trifolium angustifolium*, **Trifolium campestre*, **Ursinia anthemoides*, **Wahlenbergia capensis*, *Wahlenbergia multicaulis*, **Zantedeschia aethiopica*

Grasses: ***Austrostipa flavescens***, **Bromus diandrus*, **Cynodon dactylon*, **Ehrharta longiflora*, **Lolium multiflorum*, **Pennisetum clandestinum*, ****Pentaschistis airoides***, **Vulpia bromoides*

Sedges: **Isolepis marginata*



This area was cleared previously and has now partly regrown.

Site GG02 – Northern area proposed for sand extraction

GPS: 402496E; 6514380N

Open Scrub of *Kunzea glabrescens* over Very Open Tall Sedges

Vegetation condition – degraded

This was a small area within GG01

RECORDED SPECIES

Shrubs: *Kunzea glabrescens*

Herbs: *Cartonema philydroides*, *Lemna disperma*

Sedges: **Cyperus congestus*, **Isolepis prolifera*, **Juncus pallidus*



Site GG03 – To the west of where it is proposed to extract sand

GPS: 402288E; 6514163N also GG03A: 402421E; 6513926N

Open Low Woodland A of *Eucalyptus marginata* subsp. *thalassica* over Open Low Scrub B of *Jacksonia furcellata* over Low Grass of *Vulpia bromoides* over Herbs of *Hypochaeris glabra* in damp sandy loam

Vegetation condition – Degraded to completely degraded

RECORDED SPECIES

Trees: *Corymbia calophylla*, *Eucalyptus marginata* subsp. *thalassica*

Shrubs: *Acacia saligna*, *Astartea scoparia*, *Jacksonia furcellata*, *Jacksonia sternbergiana*, *Kunzea glabrescens*, *Xanthorrhoea preissii*

Herbs: *Dianella revoluta* subsp. *divaricata*, **Disa bracteata*, **Homeria flaccida*, **Hypochaeris glabra*, *Lobelia alata*, **Lotus angustissimus*, **Orobanche minor*, **Trifolium subterraneum*

Grasses: **Avena barbata*, **Briza minor*, **Holcus lanatus*, **Paspalum urvillei*, **Pennisetum clandestinum*, **Vulpia bromoides*

Sedges: **Cyperus congestus*, *Desmocladius flexuosus*, *Juncus pallidus*

Ferns: *Pteridium esculentum*



Site GG04 - In lower area to the west of where it is proposed to extract sand

GPS 402306W; 6514084N

Open Low Woodland A of *Eucalyptus rudis* subsp. *rudis* and occasional *Corymbia calophylla* over weeds in wet grey silty loam

Vegetation condition- Degraded

RECORDED SPECIES

Trees: *Corymbia calophylla*, *Eucalyptus rudis* subsp. *rudis*

Shrubs: *Aotus gracillima*, *Astartea scoparia*, *Taxandria linearifolia*, *Xanthorrhoea brunonis*

Herbs: *Calandrinia corrigioloides*, *Hypochaeris glabra*, *Lobelia alata*, *Lotus angustissimus*, *Trifolium subterraneum*

Grasses: *Briza minor*, *Cynodon dactylon*, *Holcus lanatus*, *Paspalum urvillei*, *Pennisetum clandestinum*, *Polypogon monspeliensis*

Sedges: *Isolepis cyperoides*, *Juncus microcephalus*, *Juncus pallidus*



Site GG05 – Open area still within the proposed northern sand extraction area

GPS: Not recorded

Very Open Tall Grass of *Ehrharta calycina* over Dense Low Grass of mixed species including *Pentaschistis airoides* and *Vulpia bromoides* over Open Herbs of *Podotheca gnaphaloides* in grey/yellow sand

Vegetation condition - Completely degraded

RECORDED SPECIES

Shrubs: *Acacia huegelii*, *Xanthorrhoea preissii*

Herbs: *Arctotheca calendula*, *Calandrinia linifolia*, *Conostylis aculeata*, *Lomandra caespitosa*, *Lotus angustissimus*, *Lupinus cosentinii*, *Ornithopus sativus*, *Panicum capillare*, *Podotheca gnaphaloides*, *Ptilotus polystachyus*, *Trifolium arvense*, *Utricularia anthemoides*, *Wahlenbergia capensis*,

Grasses: *Ehrharta calycina*, *Paspalum urvillei*, *Pentaschistis airoides*, *Vulpia bromoides*



Site S06 – Middle area and southern area proposed for sand extraction

GPS: 402898E; 6513786N (middle area) and GG06A: 2103014E; 6513095N (southern area)

Open Low Woodland A of *Eucalyptus marginata* subsp. *thalassica* over Open Dwarf Scrub C of *Xanthorrhoea preissii* over Open Low Grass of *Vulpia bromoides* over Open Herbs of *Podotrochea gnaphaloides* in yellow sand

Vegetation condition – few areas good mostly degraded

RECORDED SPECIES

Trees: *Eucalyptus marginata* subsp. *thalassica*

Shrubs: *Acacia huegellii*, *Acacia pulchella*, *Bossiaea eriocarpa*, *Daviesia divaricata*, *Daviesia incrassata*, *Gompholobium tomentosum*, *Hibbertia hypericoides*, *Jacksonia furcellata*, *Kunzea glabrescens*, *Macrozamia riedlei*, *Pelargonium capitatum*, *Xanthorrhoea preissii*

Herbs: **Arctotheca calendula*, **Citrullus lanatus*, *Conostylis aculeata*, *Crassula colorata*, **Erodium botrys*, *Gladolus caryophyllaceus*, *Kennedia prostrata*, *Lomandra caespitosa*, *Lomandra hermaphrodita*, **Lysimachia arvensis*, **Orobanche minor*, *Podotrochea gnaphaloides*, *Ptilotus polystachyus*, **Ornithopus sativus*, **Wahlenbergia capensis*, **Zantedeschia aethiopica*

Grasses: **Avena barbata*, **Bromus diandrus*, **Ehrharta longiflora*, **Pentstemonis airoides*, **Vulpia bromoides*

Sedges: **Isolepis marginatus*



At the most southern end of where it is proposed to extract sand there were many plants of *Daviesia divaricata* (See Map)

Site GG07 – Line of relatively dense Marri

GPS: 402580E; 6513207N also 402727E; 6513078N (near GG08)

Open Low Woodland A of *Corymbia calophylla* over Low Grass of *Pennisetum clandestinum* and *Lolium rigidum* over Dense Herbs of *Lotus angustissimus* in damp grey sand

Vegetation condition – completely degraded

RECORDED SPECIES

Trees: *Corymbia calophylla*, *Eucalyptus marginata* subsp. *thalassica*

Shrubs: *Jacksonia furcellata*

Herbs: *Hypochaeris glabra*, *Lotus angustissimus*, *Orobanche minor*, *Rumex crispus*

Grasses: *Bromus hordeaceus*, *Lolium rigidum*, *Pennisetum clandestinum*

Sedges: *Juncus pallidus*



Site GGS – Along narrow creek line

GPS: 402789E; 6513081N

Low Woodland A of *Eucalyptus rudis* subsp. *rudis* and *Melaleuca preissiana* over Open Tall Grass of **Paspalum distichum* in sand

Vegetation condition - degraded

RECORDED SPECIES

Trees: *Eucalyptus rudis* subsp. *rudis*, *Melaleuca preissiana*, *Melaleuca raphiophylla*

Shrubs: *Kunzea glabrescens*

Herbs: **Hypochaeris glabra*, *Lobelia alata*, **Lotus angustissimus*, **Zantedeschia aethiopicum*

Grasses: **Cynodon dactylon*, **Paspalum distichum*

Sedges: **Isolepis prolifera*, *Juncus pallidus*



Site GG09 – Damp area with lying water

GPS: 402663E; 6511559N

Open Tall Sedges of **Typha orientalis* over Open Herbs dominated by *Cotula coronopifolia* over Low sedges dominated by **Isolepis prolifera* and **Cyperus congestus* in dam sandy loam

Vegetation condition – degraded to completely degraded.

RECORDED SPECIES

Herbs: **Cotula coronopifolia*, *Lemna disperma*, **Lotus angustissimus*, **Lythrum hyssopifolia*,
**Polygonum aciculare*, **Rumex crispus*

Grasses: **Holcus lanatus*, **Pennisetum clandestinum*

Sedges: **Cyperus congestus*, **Isolepis prolifera*, **Typha orientalis*



Site GG10 adjacent to southern area proposed for sand extraction

GPS 404000E; 6511365N

Low Woodland A of *Eucalyptus totidiana*, *Banksia attenuata* and *Nuytsia floribunda* over Heath B of *Xanthorrhoea preissii* over Dwarf Scrub C of mixed taxa in yellow sand

Vegetation condition – Good

SPECIES	HEIGHT	% COVER
<i>Acacia pulchella</i>	30	<1
<i>Banksia attenuata</i>	800	5
<i>Bossiaea eriocarpa</i>	50	1
<i>Calothamnus quadrifidus</i>	60	5
<i>Conostephium preissii</i>	35	1
<i>Conostylis aculeata</i> subsp. <i>aculeata</i>	25	<1
<i>Desmocladus flexuosa</i>	25	5
<i>Eremaea pauciflora</i>	50	<1
<i>Eucalyptus totidiana</i>	1000	20
* <i>Gladiolus caryophyllaceus</i>	70	<1
<i>Gompholobium knightianum</i>	35	<1
<i>Gompholobium marginatum</i>	5	<1
<i>Haemodorun laxus</i>	50	<1
<i>Hibbertia huegelii</i>	60	25
* <i>Hypochoeris glabra</i>	50	2
<i>Jacksonia floribunda</i>	70	1
<i>Lagenophora huegelii</i>	5	<1
<i>Lepidosperma angustifolium</i>	50	<1
* <i>Lolium temulentum</i>	70	<1
<i>Lyginia barbata</i>	60	<1
<i>Mesomelaena pseudostygia</i>	50	3
<i>Nuytsia floribunda</i>	1200	2
<i>Scaevola canescens</i>	5	<1
* <i>Ursinia anthemoides</i>	60	1
<i>Xanthorrhoea brunonis</i>	80	5
<i>Xanthorrhoea preissii</i>	150	30
* <i>Aira cupaniana</i>	Opportunistic	
<i>Allocasuarina humilis</i>	Opportunistic	
<i>Anigozanthos humilis</i>	Opportunistic	
* <i>Briza maxima</i>	Opportunistic	
<i>Calandrinia pink</i>	Opportunistic	
<i>Cassutha racemosa</i>	Opportunistic	
<i>Conostylis setigera</i>	Opportunistic	
<i>Corymbia calophylla</i>	Opportunistic	
<i>Daviesia divaricata</i>	Opportunistic	
* <i>Ehrharta calycina</i>	Opportunistic	
<i>Gastrolobium capitatum</i>	Opportunistic	
<i>Hakea ruscifolia</i>	Opportunistic	
<i>Jacksonia sternbergiana</i>	Opportunistic	
<i>Lepidobolus preissianus</i>	Opportunistic	
<i>Podotheca angustifolia</i>	Opportunistic	
<i>Stirlingia latifolia</i>	Opportunistic	
<i>Stylidium amoenum</i>	Opportunistic	
<i>Synaphea spinulosa</i>	Opportunistic	
<i>Trachymene pilosa</i>	Opportunistic	
* <i>Wahlenbergia capensis</i>	Opportunistic	

Cattle walk through this bushland and graze. Kangaroos also come into this area from adjacent bushland



Several *Banksia attenuata* deaths were observed. This could be due to the long hot summer of 2010-2011 and the dry winter of 2010. Deaths of *Banksia* species are not uncommon due to the earlier hot and dry summers

Site GG11 – Within southern area proposed for sand extraction

GPS: 404000E; 6511365N

Open Woodland of *Corymbia calophylla* over Dwarf Scrub C of *Xanthorrhoea preissii* and *Xanthorrhoea brunonis* over Tall Grass of **Ehrharta longiflora* on brown/yellow sand

Vegetation condition - Degraded

RECORDED SPECIES

Trees: *Corymbia calophylla*, *Eucalyptus totiana*

Shrubs: *Bossiaea eriocarpa*, *Hibbertia hypericoides*, **Solanum nigrum*, *Xanthorrhoea brunonis*, *Xanthorrhoea preissii*

Herbs: **Zantedeschia aethiopica*

Grasses: **Ehrharta calycina*, **Ehrharta longiflora*



This was only a very small area on the eastern side beside the adjacent vegetated property

Site GG12 – Below sites GG10 and GG11 but still within the area proposed for sand extraction

GPS: 403907E; 6511343E

Open Herbs of **Hypochaeris glabra* over Low Grass of **Aira cupaniana* and **Vulpia bromoides* with scattered trees of *Eucalyptus todtiana*, *Nuytsia floribunda* and *Banksia attenuata*

Vegetation condition – completely degraded

RECORDED SPECIES

Trees: *Banksia attenuata*, *Eucalyptus todtiana*, *Nuytsia floribunda*

Shrubs: *Acacia saligna*, *Daviesia incrassata*, *Xanthorrhoea preissii*

Herbs: **Arctotheca calendula*, *Eremaea pauciflora*, **Erodium botrys*, *Hibbertia hypericoides*, **Hypochaeris glabra*, *Jacksonia furcellata*, **Lupinus cosentinii*, *Ptilotus humilis* subsp. *humilis*, *Ptilotus polystachyus*, **Trifolium arvense*, **Wahlenbergia capensis*

Grasses: **Aira cupaniana*, **Pennisetum clandestinum*, **Vulpia bromoides*



Site GG13 – Lower lying areas

GPS: 403707E; 6510862N

Pasture with emergent *Melaleuca preissiana* and *Eucalyptus rudis* subsp. *rudis* in damp loam

Vegetation condition – completely degraded

RECORDED SPECIES

Trees: *Eucalyptus rudis* subsp. *rudis*, *Melaleuca preissiana*

Herbs: **Cotula coronopifolia*, **Homeria flaccida*, **Hypochaeris glabra*, *Lobelia alata*, **Rumex crispus*

Grasses: **Briza minor*, **Holcus lanatus*, **Hordeum leporinum*, **Lolium rigidum*, **Polypogon monspeliensis*

Sedges: *Juncus pallidus*



4.2 Significant Flora

None of the species recorded during the survey are listed as threatened or priority flora.

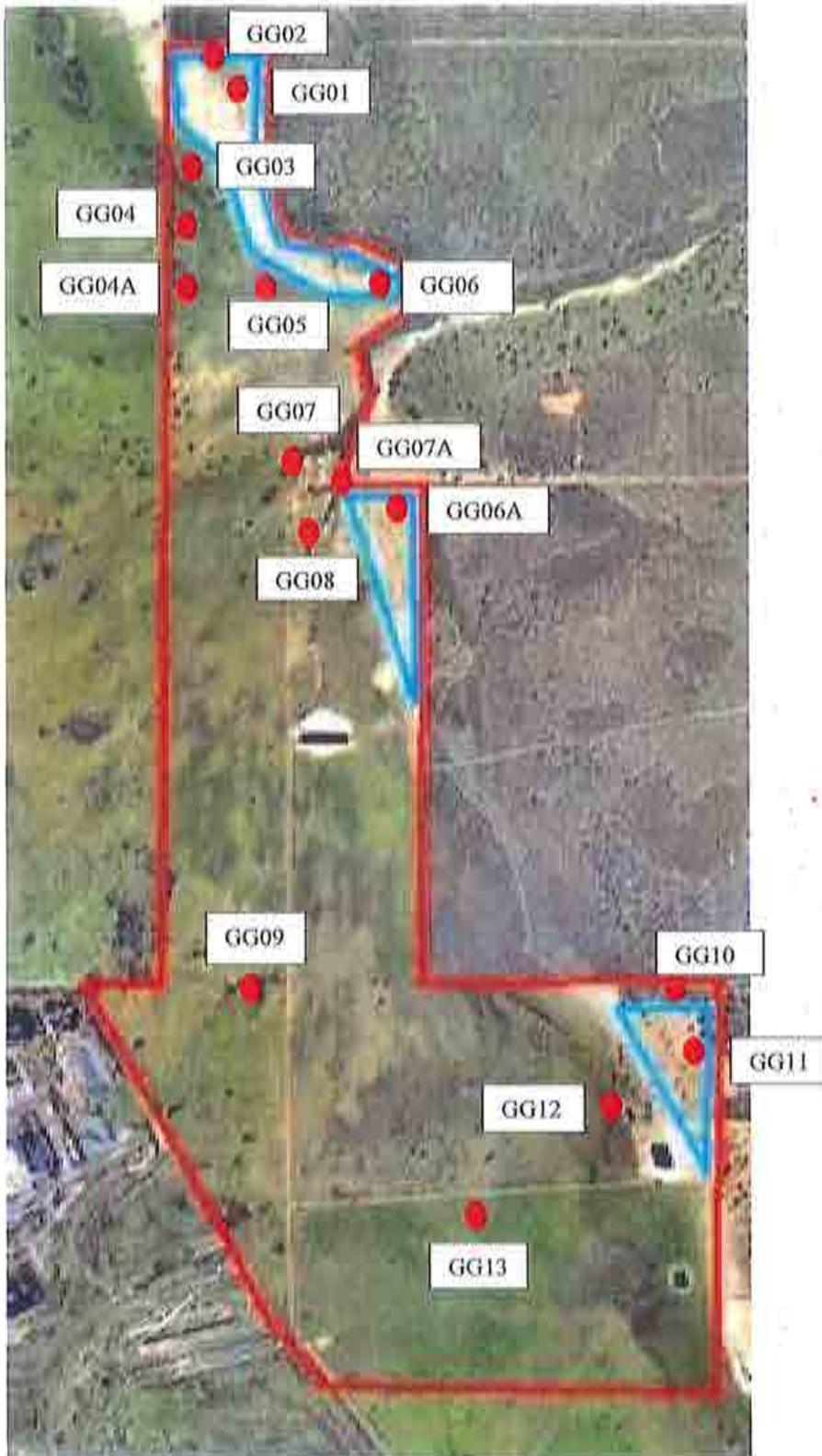


Diagram 2. Map indicating the approximate locations of all sites

5. DISCUSSION

The three areas planned for sand extraction have minimal to no native vegetation present. The most northern of the proposed sand extraction areas had some vegetation which appeared to have regrown after clearing. The *Jacksonia furcellata* shrubs were dense in some areas, but this is a common species which readily germinates after disturbance. The most southern area had remnant vegetation in good condition along the northern edge but this is not to be included in the proposed sand extraction. Only the open, degraded areas are to be included. The middle section had a few native plants present, but again the area was degraded.

The three areas selected for sand extraction are degraded. They included no significant flora and any remnants, including that at site GG10, are too small to be considered for conservation.

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ANALYSIS REPORT: 8th August 2011

CLIENT: Hall All Contracting

ANALYSIS REQUESTED: Acid Sulphate Soil Exclusion, Dieback assay, Particle Size Distribution

SAMPLE: 28th June 2011

RESULTS:

Acid Sulphate Soil Exclusion

Soil Type	pH _F	pH _{FOX}	ΔpH	H ₂ O ₂ Reaction	Sulphur	Action Criteria Met	Carbon
Orange SW	6.53	4.72	1.81	Low	0.00219%	0/5 NASS	0.0364%

Actual Acid Sulphate Soils (AASS) have a field pH less than 4. The sample does not meet this criterion so cannot be an actual acid sulphate soil.

Potential Acid Sulphate Soils (PASS) are indicated by exhibiting reduced sulphur at 0.03% or greater if a sand, or greater than 0.06% if a sandy clay and by also demonstrating at least one of the following:

- * Oxidised pH of less than 3,
- * pH reduction of more than 2 units when exposed to 30% hydrogen peroxide,
- * moderate or higher reaction to peroxide.

None of these action criteria are met, thus the sample is classified as a Non-Acid Sulphate Soil (NASS).

Lupin baiting for *Phytophthora cinnamomi* (dieback)

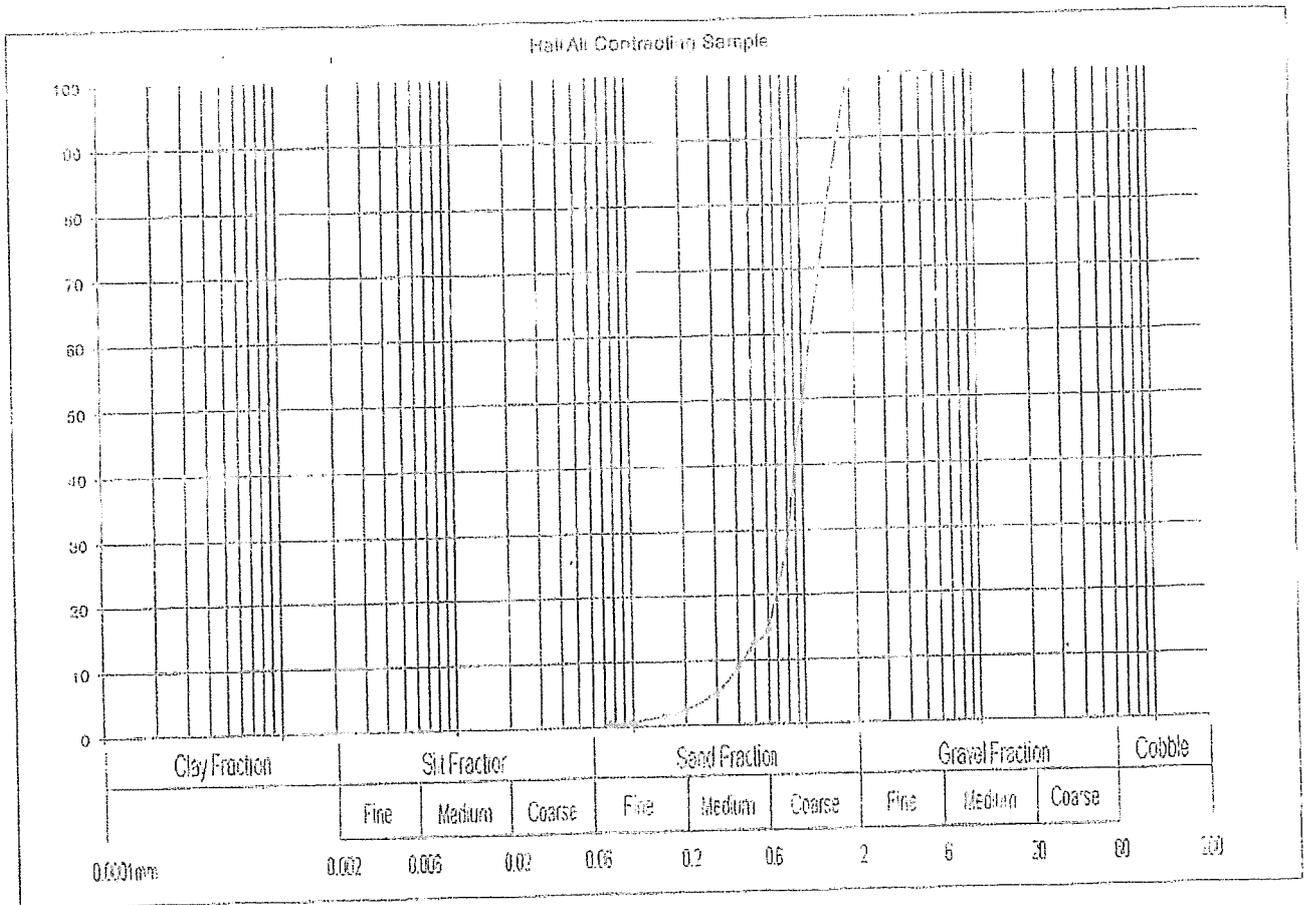
Germinated lupin seeds	Lupins with lesions	<i>Phytophthora cinnamomi</i> presence
8	7	Negative

Lupin seeds were surface sterilized and pre-soaked in deionised water overnight. Sufficiently swollen seeds that were beginning to germinate were wrapped in dampened paper towels, sealed in plastic bags and incubated for two days to encourage growth. Duplicate sterilized beakers with 1 part soil to 5 parts deionised water were prepared. In each beaker was placed a sterilized polystyrene boat holding five germinated lupin seeds, with roots hanging freely into the soil extract. Beakers were left for three days, before roots were examined for signs of disease.

Most of the exposed lupin roots were mushy and slightly discoloured. Tissue from the affected roots was removed under sterile conditions and plated to PDA. Plates were incubated at 25°C for five days, in which time no colonies of *P.cinnamomi* grew.

Particle Size Distribution

Sieve Size	% Passing	Sieve Size	% Passing
8mm	100	0.6mm	14.53
6.3mm	100	0.5mm	12.58
5mm	100	0.4mm	8.86
4mm	100	0.3mm	4.90
3.15mm	100	0.2mm	2.32
2mm	99.94	0.15mm	1.49
1mm	49.61	0.1mm	0.63
0.8mm	28.27	0.075mm	0.41



The sample is a coarse sand.

Agency Submissions			
Submitter	Comment	Proponent Response	Shire Officer Response
Office of the EPA	<p>Thank you for your correspondence dated 8 March 2017 seeking comment from the Environmental Protection Authority (EPA) regarding the proposed extractive industry for Lot 52 Old Gingin Road, Muchea.</p> <p>The EPA does not generally provide comment on development approvals. If you believe that this development will have a significant impact on the environment it can be formally referred to the EPA under section 38 of the <i>Environmental Protection Act 1986</i>. Information on what might be considered significant can be found on the EPA's website in the Referral Information guide at http://www.epa.wa.gov.au.</p>	Noted.	Noted.
Department of Lands	<p>Thank you for providing the Department of Lands the opportunity to respond to your letter dated 8 March 2017.</p> <p>Based on the information provided, the proposed development at Lot 52 on Deposited Plan 39849 Old Gingin Road, Muchea is not expected materially interfere with the exercise of rights that have been, or might in the future be, conferred under section 34 of the <i>Dampier to Bunbury Pipeline Act 1997</i> as the subject lot is not encumbered by the DBNGP corridor.</p> <p>However, the department reminds the Shire of Chittering to consider setback distances outlined in Planning Bulletin 87 which provides guidance on matters to be considered when developing within the vicinity of high pressure gas pipelines.</p>	Noted.	Noted.
Department of Planning	<p>I refer to your letter of 8 March 2017 requesting comments on the above application. The Department previously provided referral advice to the Shire regarding a sand extraction proposal on Lot 52, which I have attached for your reference.</p> <p>In addition to this previous advice, the Western Australian Planning Commission's <i>State Planning Policy 2.5</i> (SPP 2.5) was gazetted in 2016 and provides guidance on proposals for basic raw materials. Part 5.12.1 seeks to avoid land use conflict by applying separation distances used in environmental policy. Relevant to the proposal, the Environmental Protection Authority's <i>Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses</i> outlines a buffer distance of 300-500m for sand extraction. As the nearest dwellings from Pit A are approximately 800m, a sufficient separation distance can be achieved.</p> <p>The WAPC has also prepared the <i>Fact Sheet – Basic Raw Materials</i> to assist Planners with the implementation of SPP 2.5 (attached.)</p>	Noted.	<p>Noted.</p> <p>Assessment of the proposal conducted by the Shire against Part 4.15 of LPS6 has revealed that the proposal is consistent with this clause. Details of the assessment can be viewed in the officer's report. The proposal was advertised in accordance with Part 64 of the Regulations (2015).</p>
Main Roads	In reference to your correspondence of the 8 March 2017 with attachments, Main Roads WA (MRWA) has determined from the information provided that the proposed extractive industry will not have an adverse impact on the MRWA network and therefore advises no objection to the proposal	Noted.	Noted.
Department of Water	<p>Thank you for the above referral dated 8 March 2017. The Department of Water (DoW) has assessed the proposal and at this stage is unable to support the proposal for the following reasons:</p> <p>The DoW has previously been unable to support the proposal due to lack</p>	The DoW Stormwater Management Manual in its introduction explains that it was produced in response to stormwater issues relating to "built environments" such as urban, rural residential, commercial and/or industrial areas because the impervious surfaces in those locations	Noted.

	<p>information of stormwater management. Whilst some water management is discussed in the plans provided, it is not clear if groundwater is an issue on the site and if stormwater is being adequately managed. As such the DoW recommends the following condition, prior to the approval of works:</p> <p>Stormwater management plan A stormwater management plan should be prepared to ensure all water on the site is adequately managed. The Department of Water recommends that stormwater management be in accordance with the Stormwater Management Manual of Western Australia (DoW, 2004-2007). The plan should include but not be limited to; all stormwater management of hardstand areas, stormwater management of car parking areas, groundwater management if applicable, and details on how hydrocarbons will be managed to prevent pollution, in accordance with DoW's best practice management.</p>	<p>(roofs, roads, paved areas, etc) prevents direct absorption into the ground. The excavation activities won't alter the absorption because there are no impervious surfaces proposed other than potentially a small bunded area where refuelling may take place. Any fuel brought onto the site, other than fuel contained in the fuel tanks of vehicles, will be contained within a 300 litre tank mounted on a light vehicle, as described at 5.9 of the application. If required, this could be roofed. Under these circumstances we believe that a Stormwater Management Plan is unnecessary. One was not required for the previous approvals.</p>	<p>The Officer has placed a recommended condition of approval addressing the requirement for Stormwater, groundwater and hydrocarbon management plans prior to the issuing of an excavation license.</p>
<p>Chittering Landcare</p>	<p>The Chittering Landcare Centre in collaboration with the Ellen Brockman Integrated Catchment Group has reviewed the above proposal previously and also this updated proposal to extract sand from the area indicated as pit A and make the following comments</p> <ol style="list-style-type: none"> 1. There is no approved rehabilitation plan with Temma Nominees. There is no methodology by which the rehabilitation plan (?) shall take place. Reference is made to all local species and to consultation with the Chittering Landcare Centre but no consultation or confirmed plan has been prepared. The whole of section 6 - the rehabilitation plan, is entirely negated by point 6.3 that states <i>"It is intended that the end use will remain as grazing after the sand resource has been removed"</i> so any mention of planting native species and movement of fauna through the area is a nonsense. 2. Consideration still needs to be given to the proposed transport route and impact on residents and the environment. 	<p>In response to each of the points raised in this submission we submit the following:</p> <ol style="list-style-type: none"> 1. The rehabilitation principles are explained in the application and have been previously approved by Council, most recently in December 2015 when Pit C was approved. The extraction of sand from Pit B to date (the first area of extraction) has not reached a point where rehabilitation can commence, hence Landcare has not been contacted yet. The rehabilitation plan would have to be approved and implemented prior to commencement of extraction at Pit C (point 3 of Councils approval issued 23/12/15) which provides a timeframe. How much of that area is to be rehabilitated for grazing and fauna habitat will be determined with the best information available at the time. The owner still wishes to be able to use the property for productive agricultural purposes, which is the first objective for the Agricultural Resource zone under Councils LPS 6. However, by referencing native vegetation and fauna the application acknowledges that this may form part of the rehabilitation as well. The planting of 60 trees for every single tree removed does not mean that native vegetation and grazing cannot both occur. 2. Transport issues are key reasons why this application has been lodged. The Northlink project is happening and it needs sand. The sand can be transported from this site to the construction site without having to enter Great Northern Hwy. This is a major traffic safety benefit for the broader community. We recognise that the residents of Old Gingin Rd will be affected by truck movements. They will be affected for the entire period of extraction. What this proposal does is compress those movements to a period of roughly 12-18 months as opposed to movements over many years before the resource is exhausted if the site is not able to supply the high sand demands for the Northlink project. 	<p>Noted. The Shire is generally satisfied the rehabilitation plan is satisfactory if completed in accordance with staging of excavation. It has been recommended as a condition of approval that no extractive industry license is to be issued for Pit A is rehabilitation of Pit B and C is not completed to the satisfaction of the Shire.</p> <p>Noted. The applicant has been limited to twenty (20) single truck loads on a daily business. In addition to this, a condition has been recommended for dust suppression to be undertaken when necessary. The applicant is also required to make provision for the upgrade Old Gingin Road to the satisfaction of the Shire.</p>

	<p>3. A Dieback Management Plan was not attached. However, the proponent states that the area has been sampled and that the area is dieback free. This would be very difficult to prove. The area is uninterpretable due to long term clearing. Unless suitable treatment areas are established this plan is not compliant.</p> <p>4. The site of Pit A is on the palusplain of the Ellen Brook and is situated where the delta of the Yalyal Brook occurs. Basically it is a wetland that feeds into Lake Chandala, a wetland of national significance. The Yalyal Brook is a proclaimed waterway and therefore protected.</p> <p>5. Excavation for an extractive industry shall not occur (Local Planning Policy 10) where it is below the winter groundwater level. The proponent has stated that they believe the groundwater level to be the level in the dams. During winter the water level is at the surface on palusplains.</p> <p>This proposal to extract sand from the area indicated as Pit A on the aerial map not be given approval on the grounds of environmental risk to the groundwater flow to Lake Chandala.</p> <p>The conditions attached to the extraction of sand from Pit B indicate that no extraction from other areas on the property can take place until Pit B has been rehabilitated. This rehabilitation is to be native vegetation that was removed prior to excavation and not pasture for grazing.</p> <p>Pit C is yet to be excavated although the area has been recently burnt and trees removed in preparation (approval?). In this pit, setbacks need to be enforced to maintain a decent separation from the neighbouring properties that are heavily vegetated and are indicative High Value Conservation Areas in the Shire of Chittering Biodiversity Strategy.</p> <p>On a more personal note, the increased traffic on Old Gingin road that is inevitable will be detrimental to the neighbours and Landcare Centre creating heavy dust clouds despite the watering of the road. The speed at which the trucks travel on Old Gingin Road combined with the dust clouds makes entering and exiting properties dangerous to the employees, volunteers and many visitors to the Landcare Centre as well as other neighbours. Near misses have already occurred with increased truck activity on the road.</p>	<p>3. Dieback testing has been done by Bioscience and no dieback detected. A copy of this was included in the application.</p> <p>4. A review of Councils Local Planning Strategy mapping shows that Pit A is not located on the palusplain. It is located on the Gingin Scarp just east of the palusplain. The geological difference is evident both from aerial photography and the rising elevation. It is not located on the Yalyal Brook or on its delta as it is located on the early elevations of the Gingin Scarp. It contains no watercourse and therefore doesn't feed into Lake Chandala. It isn't a wetland. It's elevated and permanently dry.</p> <p>5. This point in the submission is essentially a summary of the other points. We have addressed our responses above. We acknowledge that the pits are to be excavated in order of 'B' then 'C'. This application doesn't challenge that principle. The approval process, however, is somewhat lengthy and in order to meet the urgent need for sand for the construction of the Northlink project, approvals need to be obtained, otherwise sand for that project will have to be trucked in from more remote locations at higher cost and much more heavy traffic along Great Northern Hwy. Hence this application.</p> <p>We note the suggestion that preparatory work has been commenced on Pit 'C'. This is not the case. The owner advises that three dying trees have been taken down in open grazing paddocks in recent years due to the danger they posed to livestock. There are other trees that have been dead on the ground for many years. The owner advises no burning has taken place.</p>	<p>The applicants bioscience report indicates testing did not show any signs of dieback present on site.</p> <p>The officer considers Lot 52 old Gingin to be located on a cleared portion of the Ellenbrook Palusplain. In order to assess the risks to ground water flow associated with the proposal, the officer has recommended an expert on the matter be consulted and subsequent information be provided as to any possible risks to the water table. This is to be completed prior to the issuing of an excavation license.</p> <p>Noted. See above response.</p> <p>Noted. See above response to point 4.</p> <p>Noted. The officer has recommended a condition of approval that no extractive industries license is to be granted for Pit A until such time to which Pit B has been rehabilitated to the satisfaction of the Shire.</p> <p>Pit C forms part of a separate application. The Shire is not able to condition a separate application.</p> <p>The proposal has been limited to no more than twenty (20) single truck loads on a daily basis. It is considered that this, in addition to the upgrade of Old Gingin Road will lessen the impact felt to residents.</p>
<p>Department of Parks and Wildlife</p>	<p>I refer to your letter of 8 March 2017 requesting comments on the proposal</p>	<p>Noted. This submission supports our contention (above) that Pit A</p>	<p>Noted.</p>

	<p>to extract sand from three locations within Lot 52. The department understands that this application is to extract sand from Pit A in an extension to the approval given by the Shire for the extraction of sand from Pit B and Pit C. The department does not object to the extraction of sand from Pit A.</p> <p>Parks and Wildlife has previously raised concerns over the extraction of sand from Pit C and the potential effects of this on adjoining remnant vegetation and the nearby Lake Chandala. It is noted that approval has previously been given by the shire for the extraction of sand in this area, despite these concerns being raised by the department.</p>	<p>doesn't have any negative environmental impacts.</p>	<p>Noted.</p>
Public Submissions			
<p>Public 1 SUPPORT</p>	<p>Thank you for your referral letter of 8 March 2017 seeking comment on the above extraction proposal.</p> <p>DBP as owners and operators of the Dampier to Bunbury Natural Gas Pipeline (DBNGP) have no objection to the proposed extraction activity on the above Lot as indicated on the information and plans supplied.</p>	<p>Noted.</p>	<p>Noted.</p>
<p>Public 2 OPPOSE</p>	<p>In reply to your letter requesting the approval of proposed extractive industry on Lot 52 Old GinGin Road we wish to make the following comments.</p> <p>We strongly object to the approval of an additional extractive sand resource (Pit A) being granted to Temma Nominees Pty Ltd. The reason we object being the following.</p> <p>The current licence gives them approval for the extraction of 100,000 tonnes of sand per year and approval for 20 truck load of sand per day. In the new application for approval for the opening of an extra Pit A, the applicant states the estimated quantity of sand to be extracted between 2017 to 2019 will be 1,150,000m³ from Pit A, 700,000m³ from Pit B, combined this amounts to 2,350,000m³ of sand. This is far in excess of his current licence. There are 5 sand pits and 2 gravel pits within 3km of each other in this area. We would hope the Shire could think very hard about the impact this has on nearby residents of the area before making a decision.</p>	<p>The reason for the application to add Pit A to the current approval is to supply sand for the Northlink highway construction project. By granting approval for this the extraction timeframe will potentially be compressed from decades (depending on demand) to less than 2 years. In the process it will reduce traffic conflict by having the sand delivered to a site at the southern end of Old Gingin Rd, removing the need to enter the Great Northern Hwy. This will be a significant benefit for the broader community, although it will undoubtedly result in much higher truck movements for the properties fronting Old Gingin Rd over the short term.</p>	<p>Noted.</p> <p>The officer has recommended the proposal be considered as a new planning application rather than an amendment to the existing. This will ensure appropriate rehabilitation of existing pits B and C prior to the issuing of an extractive license to Pit A. It will also ensure no increase in truck movements, dust and noise.</p>

*Note: Comments are as per original submission received by the Shire. Submission comments have not been edited unless for the purposes of confidentiality where necessary.

3.1 Town planning Scheme No. 6 – Amendment No. 29, Developer Contributions (10.9.3 Am 29)

REPORT DATE:	10 December 2007
LOCATION ADDRESS:	Southern half of Shire
APPLICANT	Shire of Chittering
AUTHOR	Max Hipkins, Consultant Planner
SENIOR OFFICER	Azhar Awang, Shire Planner
DISCLOSURE OF INTEREST	Nil
APPENDICES	1. Scheme amendment documents prepared by Minter Ellison 2. Developer Contribution Scheme Area, with precincts
DOCUMENTS TABLED	Planning Bulletin Nos. 18, 41

Summary:

The item is to progress Amendment No. 29 to Town Planning Scheme (TPS) No. 6 to introduce an additional Special Control Area for the collection of Developer Contributions to finance the Shire's physical and community infrastructure.

Background:

Over the last five years the Shire of Chittering has been subjected to unprecedented development pressures from the overspill of Perth metropolitan expansion. The Shire has been unable to protect areas of natural bush valuable for their biodiversity. Many new residential estates have little more than roads, electricity and telephone – development costs have been low and profits high.

With its small population and limited rate base, the Shire has been unable to keep pace with demands for connecting roads and drainage works, schools, recreation facilities and other community infrastructure demanded by the new residents. Unlike other Local Governments to the south, the Shire does not lie within the Perth metropolitan administrative area and enjoy the benefits of the Metropolitan Region Planning Scheme and Improvement Tax for the provision of regional open spaces, roads and other community infrastructure.

To prevent the Shire from becoming unfinancial, developer contributions are seen as the only means to maintain the financial viability of the Shire.

At a Special Meeting of Council held behind closed doors on 12 October 2007 a draft of the amendment was considered and, for the purpose of authoring discussions between the Shire's administration and State Government agencies, it was resolved as follows:

“That Council:

- 1. in pursuance of Section 75 of the Planning and Development Act 2005, resolves to initiate an amendment to Shire of Chittering Town Planning Scheme No. 6, to create an additional Special Control Area for the purpose of collecting Developer Contributions;*
- 2. numbers the amendment No. 29 of the Shire of Chittering Town Planning Scheme No. 6;*
- 3. authorises the Shire President and Chief Executive Officer to engross three (3) copies of the amendment documents in accordance with the Town Planning Regulations 1967 (as amended);*
- 4. forwards a copy of the amendment to the Environmental Protection Authority for assessment in accordance with section 81 of the Planning and Development Act 2005 prior to advertising in accordance with the Town Planning Regulations 1967 (as amended).*

With minor changes, the amendment is now presented to Council for endorsement to proceed.

Consultation:

Public consultation is part of the TPS amendment process.

Statutory Environment:

State: Planning and Development Act 2005

The power to make and amend a Town Planning Scheme is provided for by the *Planning and Development Act 2005*. The process to be followed in making or amending schemes is controlled by the *Town Planning Regulations 1967*.

Section 75 of the Act:

75. Local Planning Scheme may be Amended

A local government may amend a local scheme with reference to any land within its district, or with reference to land within its district and other land within its district, by an amendment –

- (a) prepared by the local government, approved by the Minister and published in the Gazette; or*
- (b) proposed by all or any of the owners of any land in the scheme area, adopted, with or without modifications, by the local government, approved by the Minister and published in the Gazette.*

Section 81 of the Act:

81. Referral of Scheme or Amendment to EPA

When a local government resolves to prepare or adopt a local planning scheme, or to prepare an amendment to a local planning scheme, the local government is to forthwith refer the proposed local planning scheme or amendment to the EPA by giving to the EPA -

- (a) Written notice of that resolution; and*
- (b) Such written information about the local planning scheme or amendment as is sufficient to enable the EPA to comply with section 48A of the EP Act in relation to the local planning scheme or amendment.*

Once Council has received advice from the EPA, it can advertise the amendment in accordance with regulation 15 of the Town Planning Regulations.

15. Advertisement of Scheme

(1) Where consent has been given for the Scheme to be advertised for public inspection under regulation 14 and, if that consent was conditional, the conditions have been satisfied, the local government specified in the Scheme as such shall become the responsible authority under the Act and notice of the Scheme shall be advertised in the Form No. 3 in Appendix A in accordance with subregulation (3) and the responsible authority shall take such other steps, if any, as it considers necessary, or as it is directed by the Commission to take, to make public the details of the Scheme.

(2) The responsible authority shall make available for inspection by the public during office hours -

- (a) at the office of the responsible authority; and*

(b) at the office of the Commission,

a copy of the Scheme, Scheme Report and other supporting documents, and there shall be made available at the office of any local government affected by the Scheme a copy of that part of the Scheme that relates to land within the district of that local government.

(3) The advertisement required to be made pursuant to sub regulation (1) shall be effected by publication by the Commission of the notice referred to in that sub regulation once in the Government Gazette and the Commission shall forward to the responsible authority a copy of the notice so published and thereupon the responsible authority shall publish the notice once in a newspaper circulating in the district where the land the subject of the Scheme is situated and shall also display a copy of the notice in a prominent place in the offices of the responsible authority for the period prescribed by sub regulation (5) for the lodging of submissions.

(4) The responsible authority shall give to each public authority and other person whom the local government is required by section 7(2aa) of the Act to consult, and in the case of a development scheme to every landowner within the area the subject of the Scheme a notice in writing in the Form No. 3 in Appendix A.

(5) The Commission shall, in the notice advertised or given pursuant to this regulation, describe the purpose of the Scheme, state the times and places where the Scheme may be inspected, and specify a date on or before which submissions in respect of the Scheme may be made; which date shall be not less than 3 months from the date of publication of advertisement in the Government Gazette pursuant to this regulation, except that in the case of a Development Scheme or a Scheme that does not involve the zoning or classification of land the Commission may specify a lesser period for the lodging of submissions but subject in the case of a Town Planning Scheme Amendment to regulation.

Planning Bulletin No. 18 Developer Contributions for Infrastructure, February 1997.

Planning Bulletin No. 41 Draft Model Text Provisions for Development Contributions, July 2000.

Policy Implications:

The proposed amendment will provide legislative backing for Local Planning Policy No. 28 - POS Dedication on Rezoning and the payment of developer cash contributions.

Financial Implications:

The amendment to introduce developer contributions is considered to be the best means for the Shire to remain financially viable

Strategic Implications:

The strategic implications are that the Shire would be able to face future works programs with confidence, knowing that an ongoing source of funding was permanently available.

Voting Requirement:

Absolute Majority Required: No

Site Inspection:

Site inspection undertaken: Yes

Triple Bottom Line Assessment:

Economic Implications:

Financial viability for the Shire.

Social Implications:

Increased development costs could be passed on to first home buyers but more facilities would be available to residents.

Environmental Implications:

Developer contributions would be available for purchase and maintenance of conservation areas.

Comment:

The Shire's administration has worked with Council's solicitors in producing the amendment documents, which have now been cleared by officers of the Department Planning and Infrastructure. Documents can now be formally referred to the Western Australian Planning Commission. After receiving notification from the Commission and any comments from the Environmental Protection Authority, the amendment will be in order for advertising for public comments.

OFFICER RECOMMENDATION TO BE DEBATED AND RESOLVED BY COUNCIL

"That Council forwards a copy of documents relating to amendment No. 29 of the Shire of Chittering Town Planning Scheme No. 6 to the Western Australian Planning Commission, in accordance with regulation 4 (3) of the Town Planning Regulations 1967 (as amended)".

SHIRE OF CHITTERING

**TOWN PLANNING SCHEME No. 6
AMENDMENT No. 29**

DEVELOPMENT CONTRIBUTION SCHEME

prepared by

Minter Ellison Lawyers

October 2007

Contents

1. Background
2. Development Contribution Scheme
 - 2.1 Planning precincts
 - 2.2 Development contribution plan process
 - 2.3 Calculating the contribution
 - 2.4 Payment of the contribution
 - 2.5 Bulletin 41 – draft development contributions
 - 2.6 Provision of POS
3. Proposed Scheme Provisions
 - 3.1 Development Contribution Scheme
 - 3.2 Ceding of POS in Rural Zones

1. Background

The Shire of Chittering (Shire) proposes to introduce provisions into Town Planning Scheme No 6 (TPS 6) to enable the Shire to require developers to contribute to the provision of infrastructure and social and community facilities within the district.

The concept of scheme provisions relating to development contributions for community facilities is lawful by reason of the Planning and Development Act 2005 (P&D Act). In particular, Schedule 7 to the P&D Act sets out the matters which may be dealt with by a planning scheme. Clause 5(2) of Schedule 7 states that a planning scheme may make provision for:

'Public works and undertakings of any kind including lighting, water, sewerage, drainage, public transport and associated facilities on land and water.

And clause 5(4) of Schedule 7 provides that planning schemes may provide for:

'The provision and location of public facilities and conveniences and any other objects or works on the land.'

The Western Australian Planning Commission's (WAPC's) Planning Bulletin No 18 (February 1997) (Bulletin 18) authorises local governments to require development contributions, inter alia, through enabling provisions being inserted into planning schemes (see section 6 of Bulletin 18). Planning Bulletin No 41 – Draft Model Text provisions for Development Contributions (Bulletin 41) sets out draft scheme text provisions to be inserted into local planning schemes.

The concept of development contributions is becoming increasingly common in local government areas which are under pressure for land use change and development. For example, the City of Wanneroo has in place a scheme of development contributions to facilitate the orderly development of land in East Wanneroo. Likewise, the City of Stirling has developed a scheme of development contributions as part of the development of the Stirling (Innaloo) Strategic Regional Centre. The Shire of Kalamunda, another shire on the fringe of the metropolitan region, also has in place a scheme of development contributions to ensure the orderly subdivision and development of land.

The Shire now finds itself in a similar predicament. The last five years (particularly the last two years) have seen unprecedented pressure for subdivision and development within the Shire. The rapid rise in median housing prices across Perth, as well as other forces for change relating to scenic rural areas, have resulted in an unprecedented escalation of demand for housing lots within the Shire.

At this time, the Shire is a small rural district with a small base of ratepayers. The total population of the Shire as at the 2006 census was 3683 people. However, the Shire is currently experiencing a growth rate of 6.3 per cent per annum and this growth is predicted to continue for the foreseeable future.

The Shire has been proactive in its strategic and statutory planning. The Shire has prepared a Local Rural Strategy (Strategy) to guide statutory planning within the Shire from 2001 to 2015. The Strategy was endorsed by the WAPC on 29 June 2004. Furthermore, TPS 6 was only gazetted in November 2004 and is therefore a relatively recent (and therefore current) planning scheme.

However, the assumptions which underpin the Strategy and TPS 6, including the 15 year timeframe on which the Strategy is premised, have been rendered somewhat redundant by the effects of the resources-led economic boom which has accelerated demand for subdivision and development far beyond the levels planned for in the Strategy. Ironically, the Strategy has been a contributing factor to the predicament the Shire now finds itself in as it is the Strategy which, in effect, allows significant volumes of rural land to be rezoned for rural residential subdivision and development purposes.

The North-East Corridor Extension Strategy (2003) (Extension Strategy) identifies a future 'urban' area within the Shire approximately 12 kilometres north of the ~~Bullsbrook~~ Muchea townsite. The Shire considers that the eventual urbanisation of a southern portion of the Shire is inevitable - given the Shire's location on the fringe of the Perth metropolitan region, within 50km of the central business district - and desirable from a planning point of view as it would provide a 'town centre' focus to the rural subdivisions which are currently occurring in the southern portions of the Shire (and the northern portions of the City of Swan).

However, the timeframe of the Extension Strategy (2029) needs to be reconsidered in the light of the current demand for housing in the Shire in the context of continued strong economic growth in Western Australia. Nevertheless, the development of land for urban purposes consistent with the Extension Strategy is not a practical option in the short term as there is no capacity for reticulated

water and sewerage to be provided to land within the Shire. Until the Shire has traditional urban land available for development, there will continue to be a deficiency in the provision of community facilities, in particular public open space (POS). This is because under current WAPC policies, there is only limited capacity to request POS as part of a rural residential rezoning and subdivision. The WAPC's generic policies relating to open space in rural residential areas are only of limited value in a Shire where there is no other form of development than rural residential and where there is less than 1% of land allocated to recreation purposes.

The accelerated demand for housing and development within the Shire has hastened the need for the Shire to consider carefully the issue of properly servicing development. The Shire is under significant financial pressure to meet the costs of servicing the additional subdivision and development within the district.

The WAPC and the Minister for Planning (Minister) would be aware that, as a reaction to the unprecedented levels of demand for scheme amendments flowing from the Strategy, the Shire has recently put in place a 12 month moratorium on amendments to TPS 6. The purpose of the moratorium is to free up finite resources, to allow the Shire to refocus its strategic planning efforts in light of the shift in demand that has been experienced.

Being a rural locality, with almost all new development being the conversion of rural land into rural residential or lifestyle housing, the Shire is currently in a vulnerable position. This is because, unlike standard urban communities in the metropolitan region where the provision of infrastructure and community and other facilities is a natural consequence of the corridor and structure planning process, the Shire has no such mechanism for the provision of these facilities.

The Shire is not within the Metropolitan Region Scheme but is increasingly being viewed as an outer suburb of Perth. As a result, residents, both established and new, are demanding an appropriate standard of services from the Shire and this is difficult to provide across a dispersed low density settlement pattern and in a climate where land values are prohibitively expensive.

Drawing all these considerations together, the Shire considers that the need to act to ensure the Shire is able to properly provide for residents, both current and future, is clear and manifest and consistent with the principles of sound planning practice and good municipal government. There is a clear

planning need in the Shire for better community facilities but the Shire currently has insufficient means in which to meet this need.

The amendment to introduce a Development Contribution Scheme (DCS) into TPS 6 is an important step for the ongoing statutory and strategic planning of the Shire.

2. Development Contribution Scheme

The DCS has been prepared having regard to the principles set out in the WAPC's Planning Bulletins 18 and 41.

2.1 Development Contribution Areas

As is the case with development contribution schemes in other local governments, the Shire proposes to divide the Shire into eight planning precincts (called Development Contribution Areas (DCA) in the proposed scheme provisions) which are distinguishable in a geographic sense as well as on the level of physical and social services required in each, as illustrated in Figure 1. These are:

1. Future Town Centre (west of Great Northern Highway, between Bindoon and Muchea, within the locality of Chittering)
2. Bindoon (centred on the township of Bindoon, within the localities of Bindoon, Mooliabeenee and Chittering)
3. East Chittering (adjoining the Shire's eastern boundary, within the localities of Bindoon, Chittering and Lower Chittering)
4. Chittering Valley (adjoining the Brockman River between Great Northern Highway and the Shire's southern boundary, within the localities of Bindoon, Chittering and Lower Chittering)
5. Lower Chittering (adjoining the Shire's southern boundary, within the localities of Chittering, Lower Chittering and Muchea)

6. Employment Node (east of Great Northern Highway, within the localities of Mucea and Lower Chittering)
7. Mucea (adjoining the Shire's southern boundary, within the locality of Mucea)
8. North Chittering (balance of Shire).

2.2 Planning process for the DCS

The DCS will proceed on the basis of a development contribution plan (DCP) which would be prepared by the Shire for each DCA. Each DCP will identify the provision of future shared facilities and infrastructure (major roads, drains, schools, ovals and recreation centres) that subdividers in that DCA will be contributing to. Developers would then be required to prepare a development plan (pursuant to clause 5.8.1 of TPS 6) for their land which would provide more detailed planning than the structure plan.

The actual per lot contribution to be made within each DCA will be determined by the level and type of facilities required in that DCA, following the preparation of the DCP and careful consideration of the planning needs of each DCA. A portion of the contribution made within each DCA would be made available for wider projects across the Shire – including the provision of major roads, drainage and environmental projects.

2.3 Calculating the contribution that is payable

It is not possible to determine the precise level of contribution for each DCA ahead of the DCP process. As stated, the Shire recently put in place a 12 month suspension with respect to progressing new amendments to TPS 6, to allow staff to undertake strategic planning within the Shire.

It is proposed to insert the detailed provisions relating to the payment of the contributions payable under the DCS in a developer contribution policy (Contribution Policy). However, unlike a standard planning policy prepared under clause 2.2 of TPS 6, the Shire proposes that the Contribution Policy be prepared and adopted by the Shire as well as the ~~Minister for Planning~~ WAPC. This will ensure that there is no perception that the Shire is acting unreasonably in implementing the DCS and that the contribution scheme is broadly consistent with those operating across other local governments.

Further, by requiring the consent of the ~~Minister~~ WAPC, the Minister ~~and the WAPC~~ can be confident the Shire is not acting beyond the limits imposed by the P&D Act by utilising a Contribution Policy.

The contribution payable by each subdivider will be ascertained following the preparation of the DCP for each DCA. The Shire will then carefully estimate the cost of undertaking the necessary works and providing the required facilities in that DCA and divide the total cost by the estimated number of additional lots that will be generated in that DCA. This will identify the per lot contribution which may be adjusted annually to take account of movements in the Consumer Price Index.

While it is not common to impose a DCS by way of a policy, rather than detailed provisions within a planning scheme itself, the Shire considers that having the detailed requirements of the developer contribution in the Contribution Policy is advantageous as it would allow the level of contribution to be adjusted (or completely abandoned) as needs change. A policy has the advantage of being more easily amended and adjusted over time than detailed scheme provisions (as set out in Bulletin 41) and, importantly, allows community input through the advertising process. Furthermore, a policy is pragmatic and sensible in the context of the current rural-based needs of the Shire (as opposed to metropolitan local governments where more complex, detailed and costly arrangements are required).

The DCP for each DCA will be prepared as part of the Contribution Policy.

The scheme provisions will ensure that any monies raised through the DCS will be put towards legitimate projects pursuant to Schedule 7 to the P&D Act as is required under Bulletin 41.

2.4 Payment of the contribution

The actual contribution made by a developer will be a per lot contribution which would become payable upon the subdivision of the land (as a condition of subdivision) or under the terms of a legal agreement between the Shire and the developer.

The Contribution Policy will contain discretion for the Shire to waive the requirement to pay the developer contribution for minor subdivision proposals (less than 3 lots).

2.5 Bulletin 41 – draft developer contributions

The Shire has prepared the DCS having regard to the principles of Bulletin 41 and employing the majority of model provisions therein. Consistent with Bulletin 41, the underlying objectives of the DCS are to:

- (a) introduce a mechanism to deal with cost contributions which relate to subdivision and development;
- (b) provide for equitable sharing of infrastructure costs between owners and to ensure that owners contribute only towards such infrastructure that reasonably relates to the subdivision and development of land within the DCA; and
- (c) co-ordinate the timely provision of infrastructure.

However, while the majority of the proposed clauses which implement the DCS mirror the model clauses in Bulletin 41, there are some departures. The most apparent modification is that the detailed provisions relating to the DCS are proposed to be contained in a Contribution Policy. The Shire favours a more simple policy framework for its rural district than draft provisions contained in Bulletin 41. However, the underlying safeguards within Bulletin 41 are maintained because the Contribution Policy will be subject to approval by the ~~Minister~~ WAPC.

The Shire believes it more appropriate for the 'trigger' to pay the contribution to relate only to subdivision of land in the Shire as the Shire considers the addition of dwellings and residents (through the subdivision process) is the ultimate reason why the DCS has become necessary.

Based on the Shire's experience that there is a direct link between additional dwelling lots and the demand for upgraded infrastructure and new facilities, the Shire also favours a per lot contribution with subdivision being the 'trigger'. This is minor departure from the provisions of Bulletin 41 which allow a contribution to be extracted at the point of subdivision, development or following a change in use (refer draft clause 6.3.5 of Bulletin 41).

Because the number of additional lots generated by subdivision is the focus of the Shire's DCS, the Shire proposes that the contribution be payable on a per lot basis, as a variant of the land valuation methods (market value and fair and net expectance value) set out in Bulletin 41. However, the Shire reiterates that the principles which underpin Bulletin 41, which ultimately relate to establishing an

equitable arrangement for the cost sharing of infrastructure, have been maintained by the Shire in developing the DCS.

2.6 Provision of POS

The amendment also includes provisions which allow the Shire to request ~~40%~~ 5% of gross subdivisible land to be provided to the Shire for local open space (passive and active) as well as up to an additional 5% for regional open space for biodiversity conservation and landscape purposes. As stated above, the provision of POS is a critical issue for the Shire as there is less than 1% of the Shire currently reserved for open space purposes and there is no regional planning scheme or improvement tax to assist with the reservation and purchase of regional open space.

Other local authorities have in place scheme provisions allowing for a percentage of land to be ceded for open space purposes for rural residential subdivisions (such as the Shire of Mundaring, within the metropolitan region, under the Metropolitan Region Scheme, with access to and the benefits of the Metropolitan Improvement Tax).

Furthermore, Bulletin 18 authorises the provision of POS in rural residential subdivisions where:

- (a) the land constitutes an important landscape feature or conservation area;
- (b) the land is an integral part of the development's purpose;
- (c) the proposed development will be primarily residential or the land is required to achieve a linear open space system; or
- (d) there is a need for incidental local open space.

There is clear planning need for POS in the Shire. Given that there is no 'urban' development occurring within the Shire, particularly in the lower regions of the district, there is simply no land being allocated for this purpose despite the intense subdivision and development of land that is occurring in this region. The growing community in the Shire, particularly in southern Chittering, requires access to open space for both active and passive purposes. As stated, there is currently less than 1% of the Shire reserved for POS. The Shire has previously prepared two policies pursuant to TPS 6 (Policy

Nos 28 and 32) to require public open space in rural residential type subdivisions which have received overwhelming support from the community.

The reasons for acquiring POS when land is first subdivided, rather than later when resubdivided for higher density 'urban' development, are that it is cheaper and easier to do so at this time and is needed at this time to meet current and expected demands.

The Shire's ovals and recreation spaces are heavily used at the present time. The acquisition of more land for POS is seen as the only way to satisfy demands for communal exercise areas as well as land for horses and additional sporting grounds.

The Shire submits that the scheme provisions which authorise that up to 10% of the land for a rural residential subdivision be provided free of cost are a sensible response to the planning needs of the Shire on the basis that:

- (a) the provision of POS in rural residential areas is authorised by Bulletin 18 where the open space is for conservation, landscape or primarily residential purposes; and
- (b) the unique circumstances of the Shire and the acute need for the Shire to provide POS to its communities (current and future).

3. Proposed Scheme Provisions

3.1 Development Contribution Scheme

The enabling provisions for the DCS are as follows:

Clause 6.1 is amended to add a new dot point after 'Land Refuse' which reads:

"Development Contribution Scheme".

TPS 6 maps and legends are amended to identify the Development Contribution Area or Areas.

The following clauses are then inserted into TPS 6.

"6.7 DEVELOPMENT CONTRIBUTION SCHEME

The Development Contribution Area or Areas are shown on the Scheme Map.

6.7.1 Interpretation

In clause 6.7, unless the context otherwise requires:

"Commission" means the Western Australian Planning Commission, as constituted by the *Planning and Development Act 2005*;

"Contribution Scheme" means the Development Contribution Scheme established by clause 6.7 which allows the Local Government to require subdividers to contribute towards the cost of Infrastructure within the Development Contribution Area;

"Contribution Scheme Policy" means a policy prepared by the Local Government in accordance with this clause to implement the Contribution Scheme;

"Cost Contribution" means the contribution to the cost of Infrastructure payable by a Subdivider under clause 6.7.3 and the Contribution Scheme Policy;

"Development Contribution Area" means an area of land within the district of the Local Government to which the Contribution Scheme relates. There may be one or more Development Contribution Areas.

"Infrastructure" means services and facilities which, in accordance with the Contribution Scheme Policy, it is reasonable for Subdividers to make a Cost Contribution towards; and

"Subdivider" means an owner of land that is undertaking a subdivision where the land is located within the Development Contribution Area.

6.7.1 Purpose of the Contribution Scheme

- (a) To identify areas requiring Cost Contributions that relate to subdivision.

- (b) To provide for the equitable sharing of the costs of Infrastructure between Subdividers and in particular, to ensure that Cost Contributions are only required towards such Infrastructure as is reasonably required as a result of the subdivision of land in the Development Contribution Area.
- (c) To coordinate the timely provision of Infrastructure.

6.7.2 Principles of the Contribution Scheme

The Contribution Scheme and Contribution Scheme Policy for any Development Contribution Area is to be prepared in accordance with the following principles:

- (a) it is to provide for Cost Contributions only to the cost of such Infrastructure as fairly and reasonably relates to, and is reasonably required as a result of, the subdivision of land in the Development Contribution Area;
- (b) it is to provide for Cost Contributions generally in accordance with the Local Government's and ~~Western Australian Planning Commission's~~ policies on developer contributions for infrastructure;
- (c) matters requiring land contribution, such as public open space, are to be assigned a monetary value;
- (d) the Cost Contribution is to be based upon the number of additional lots to be used for dwelling purposes created by the Subdivider within the Development Contribution Area; and
- (e) the cost of Infrastructure is to be based on amounts expended, but when an expenditure has not occurred, it is to be based on the best and latest estimated costs to the Local Government.

6.7.3 Payment of Cost Contribution is a prerequisite to subdivision

- 6.7.3.1 Where a Development Contribution Area is prescribed in the Scheme, all subdividers within that Development Contribution Area are required to make a Cost Contribution in accordance with the Contribution Scheme and the Contribution Scheme Policy.
- 6.7.3.2 A Contribution Scheme Policy established by clause 6.7.5 does not have effect until it has been endorsed by the Minister for Planning.
- 6.7.3.3 Subject to clause 6.7.3.4, the Local Government is not to support subdivision or approve development in a Development Contribution Area until the Contribution Scheme Policy is in effect and the Subdivider who has applied for subdivision approval has made arrangements in accordance with clause 6.7.11 for the payment of the Subdivider's Cost Contribution.
- 6.7.3.4 During the period where the Contribution Scheme Policy is required but has not been approved by the ~~Minister for Planning~~ Commission, the Local Government may support subdivision where the Subdivider has made other arrangements satisfactory to the Local Government with respect to the Subdivider's Cost Contribution towards the provision of Infrastructure in the Development Contribution Area.

6.7.4 Cost Contribution payable

6.7.4.1 The Contribution Scheme applies upon the subdivision of any land within a Development Contribution Area as shown on the Scheme Map. The Cost Contribution payable by a Subdivider shall be determined by reference to, and paid in accordance with, the Contribution Scheme Policy prepared and endorsed by the Local Government.

6.7.5 Preparation of the Contribution Scheme Policy

6.7.5.1 The Contribution Scheme Policy shall be prepared pursuant to clause 2.4 of the Scheme but shall be placed on public advertising for submissions for a period of not less than 42 days.

6.7.5.2 Following consideration of submissions and endorsement of the Contribution Scheme Policy by the Local Government the Local Government shall forward the Contribution Scheme Policy to the ~~Minister for Planning~~ Commission.

6.7.5.3 Upon receipt of the Contribution Scheme Policy the ~~Minister for Planning~~ Commission may ~~has 3 months in which to~~ require the Local Government to amend the Contribution Scheme Policy.

6.7.5.4 The Local Government ~~must~~ shall amend the Contribution Scheme Policy as directed by the ~~Minister for Planning~~ Commission.

6.7.5.5 If the ~~Minister for Planning~~ Commission does ~~has~~ not responded or commented on the Contribution Scheme Policy ~~within 3 months of receipt,~~ the ~~Minister~~ the Commission is deemed to consent to the Contribution Scheme Policy without amendment.

6.7.6 Content of Contribution Scheme Policy

6.7.6.1 The Contribution Scheme Policy is to specify:

- (a) the Development Contribution Area to which the Contribution Scheme Policy applies;
- (b) the Infrastructure to be funded through the Contribution Scheme Policy; and

- (c) the method of determining the Cost Contribution of each Subdivider towards the Infrastructure to be funded through the Contribution Scheme.
- 6.7.6.2 The Contribution Scheme Policy is to specify the period during which it is to operate but in any event, is not to operate for more than 5 years.
- 6.7.6.3 The period during which the Contribution Scheme Policy is to operate may be extended and the Contribution Scheme Policy may be amended accordingly.
- 6.7.6.4 (a) Where a Contribution Scheme Policy contains estimated costs, such estimated costs are to be reviewed at least annually by the Local Government in accordance with the best and latest information available to the Local Government until the expenditure on the relevant item of Infrastructure has occurred.
- (b) Where requested in writing by a Subdivider, the Local Government is to have such estimated costs independently certified by an appropriate qualified person.
- 6.7.6.5 Where any Cost Contribution has been calculated on the basis of an estimated cost for Infrastructure, the Local Government may:
- (a) adjust the Cost Contribution of any Subdivider in accordance with the revised estimated costs or the final expenditure; or
- (b) accept a Cost Contribution based upon estimated costs as a final Cost Contribution and may enter into an agreement with a Subdivider accordingly.
- 6.7.6.6 Where a Subdivider's Cost Contribution is adjusted under clause 6.7.6.5 (a) the Local Government, on receiving a request in writing from the Subdivider is to provide the Subdivider with a copy of estimated costs and the calculation of adjustments.
- 6.7.7 Liability to pay Cost Contribution
- 6.7.7.1 A Subdivider's liability to pay the Subdivider's Cost Contribution to the Local Government arises when the Local Government confirms to the ~~Western Australian Planning Commission~~ that conditions of subdivision approval supervised by the Local Government and imposed on an application to subdivide the Subdivider's land within the Development Contribution Area have been complied with; or

6.7.7.2 Notwithstanding clause 6.7.7.1, a Subdivider may enter into a legal agreement with the Local Government to pay the Cost Contribution independent of a subdivision application. Such agreement shall be to the satisfaction of, and at no cost to, the Local Government.

6.7.8 Administration of funds

6.7.8.1 The Local Government is to establish and maintain a reserve account in accordance with the *Local Government Act 1995* for each Development Contribution Area into which Cost Contributions for that Development Contribution Area will be credited and from which payments for the cost of Infrastructure within that Development Contribution Area will be paid.

6.7.8.2 Notwithstanding clause 6.7.8.1 the Local Government has discretion to expend money from the reserve account of any or all Development Contribution Areas for any Infrastructure within the Contribution Scheme or the Local Government's district generally, if it is of the opinion that the Infrastructure will benefit that or those Development Contribution Areas or the district generally.

6.7.8.3 The Local Government has discretion to transfer funds from reserve accounts of any Development Contribution Area to fund any Infrastructure but where the provision of that Infrastructure does not benefit the Development Contribution Area in which the funds were contributed, shall reimburse any transferred funds at the earliest opportunity.

6.7.8.4 Moneys borrowed by the Local Government to fund Infrastructure within a Development Contribution Area may be repaid to the Local Government out of the reserve account for that Development Contribution Area.

6.7.8.6 The Local Government is to provide to every Subdivider an audited annual statement of accounts for that Development Contribution Area as soon as practicable after the audited annual statement of accounts becomes available.

6.7.9 Charge

The liability of any person to pay the Cost Contribution is a charge on the land to which the Cost Contribution relates and the Local Government may lodge a caveat against the title to that land in respect thereof. The Local Government may withdraw a caveat to allow registration of a dealing in the land and thereafter lodge another caveat. On the payment of the Cost Contribution under the Contribution Scheme in respect of the land the Local Government shall withdraw the caveat.

6.7.10 Acceptance of land in lieu of money

The Local Government may at its discretion agree to accept land in fee simple within a Development Contribution Area to the value of any moneys due in respect of the Cost Contribution.

6.7.11 Payment of Cost Contribution

6.7.11.1 The Subdivider, with the agreement of the Local Government, is to pay the Subdivider's Cost Contribution by:

- (i) cheque or cash;
- (ii) transferring to the Local Government land to the value of the Cost Contribution;
- (iii) some other method acceptable to the Local Government; or
- (iv) any combination of these methods.

6.7.11.2 The Subdivider, with the agreement of the Local Government, may pay the Subdivider's Cost Contribution in a lump sum, by instalments or in such other manner as agreed with the local government.

6.7.12 Shortfall or excess in Cost Contributions

6.7.12.1 If there is a shortfall in the total of Cost Contributions when all Cost Contributions have been made or accounted for in a particular Development Contribution Area, the Local Government may:

- (a) make good the shortfall from its municipal fund;
- (b) enter into agreements with Subdividers to fund the shortfall; or
- (c) raise loans or borrow from a financial institution,

but nothing in paragraph 6.7.12.1 (a) restricts the right or power of the Local Government to impose a differential rate to a specified Development Contribution Area in that regard.

6.7.12.2 If there is an excess in the total of Cost Contributions when all Cost Contributions have been made or accounted for in a particular Development Contribution Area, the Local Government is to use the excess funds for the provision of additional facilities in that Development Contribution Area."

3.2 Ceding of POS in Rural Zones

The enabling provisions to allow the ceding of land for POS in the Rural Residential Zone, Rural Retreat Zone and Small Rural Holding Zone are:

"5.8.1.1 Further to clause 5.8.1(b), the Local Government shall require up to 10% of the gross subdivisible area of the Development Plan to be shown as a reserve for parks and recreation.

5.8.1.2 Land identified for parks and recreation purposes in the Development Plan shall be transferred to the Local Government in fee simple as a condition of subdivision or, alternatively, in accordance with a legal agreement with the Local Government. The preparation of a legal agreement shall be to the satisfaction of, and at no cost to, the Local Government."

Shire of Chittering

DEVELOPER CONTRIBUTION PLAN – REVIEW OF DIRECTIONS

The purpose of this paper is to review the direction that should be taken on a Development Contribution Plan (DCP) for the Shire of Chittering and provide a recommendation for such.

This review is triggered by the statistical assessment of actual lot yields recently collated by the Department of Planning as part of preparation of the Local Planning Strategy for the Shire.

Background

The Western Australian Planning Commission has established State Planning Policy 3.6 to provide guidance for the use of DCPs by local government. The policy identifies the circumstances where contributions can be sought from developers toward shared infrastructure. The nature of items that can be subject to contribution requirements range from utility services through to community infrastructure.

The Shire has previously resolved to prepare a DCP for the coordinated provision of community services for the Shire. SPP Consulting was appointed by the Shire in 2014 to prepare a DCP. Outputs from this work included a draft cost apportionment and contribution liability report. Consultancy Game Planning Australia (GPA) was subsequently appointed to review the potential terms of a DCP. The methodology employed by GPA in this regard involved preparing a series of discussion papers aimed at establishing agreed principles to govern the operative terms of a possible DCP. Four papers were produced by GPA addressing key considerations as they relate to the Shire, namely:

Paper 1	Strategic Approach to Infrastructure Provision
Paper 2	Infrastructure Item Definition and Proportions
Paper 3	Contribution Area Definition
Paper 4	DCP Operations

A range of positions were established through the formulation of the discussion papers, including:

- Payment obligations only to apply to newly created housing lots (ie excluding industrial, commercial and agricultural land); and
- New housing is responsible for 25% of community infrastructure requirements over 10 years (based on assumed forecast growth rates).

These considerations are relevant to the suitability of a DCP for the Shire of Chittering.



Draft Local Planning Strategy

The Department of Planning has collated information to inform the Shire's Local Planning Strategy. This includes an analysis of population growth rates, actual lot creation and lot production forecasts.

Work to date to prepare the DCP has been based on a forecast population growth rate of 4.1% per annum over the next 10 years. Based on average occupancy rates, this growth would generate the need for an additional 870 dwellings over 10 years.

The Department of Planning has found, however, that the actual lot production rate is significantly lower than modelled growth scenarios. Data collated by the Department finds only 71 lots have been created since 2009. This amounts to approximately 10 lots per year – significantly less than modelled scenarios that would yield around 87 dwellings per year.

Subdivision approvals granted by the Western Australian Planning Commission provide for 1793 lots over the same timeframe, however as mentioned above, only 71 titled lots were created. This variation indicates the speculative and unpredictable nature of the local housing market.

Balance of Benefits

DCPs can be a helpful means to ensure equitable sharing of costs amongst those who benefit from the services provided. The benefits of a DCP, however, need to be evaluated in regards to the level of assistance provided. An assessment of the merit of pursuing a DCP will consider the following:

Administrative Tasks/Costs Associated with DCPs

Considerable administrative effort is required to manage a DCP. The cost of doing so does not add value to the services and facilities delivered to the community as they involve a range of intricate tasks that are not otherwise required. This includes considerable coordination across the various technical departments of Council:

- Finance:*
- Maintaining and reporting on separate accounts and transaction records.
 - Managing cash-flow of the DCP, including pre-funding agreements (including Council pre-funding).
 - Preparing cash-flow forecasting based on development expectations.
 - Issuing invoices for payments.
 - The heightened accountability requirements for DCPs through the requirements of the Local Planning Scheme should also be noted.



- Engineering:*
 - Defining/reviewing technical specifications of works for valuation and ongoing re-evaluation purposes.
 - Coordinating works programming with financial management arrangements.
- Town Planning:*
 - maintaining detailed records of land areas that have discharged obligation to the DCP, and those areas where payments remain outstanding.
 - Ongoing review/revision of forecast yields for periodic re-distribution of DCP cost responsibilities.
 - Applying payment obligations upon statutory approvals.
- Other:*
 - Undertaking periodic re-valuation of cost estimations, including facilitating third-party review of costs as provided for by the Scheme.
 - Re-calculating cost re-distributions for input to financial cash-flow forecasting and invoicing.

Attachment One sets out a range of subdivision and development scenarios, with a corresponding commentary on whether a payment obligation would apply to the circumstance. The range of considerations involved illustrates the complexity involved with the town planning administration of a DCP.

DCPs Limit Council's Flexibility

A DCP identifies a set array of cost items – well ahead (up to 10 years) of provision, and attempts to forecast the suitability, need, cost, viability and priority of those items at this point in time. Effectively, a DCP locks Council into a long-term commitment. Attempts to change the terms of the commitment involve a Scheme amendment, and introduce inequities for those who have already paid, and those who are yet to pay the DCP levy.

Grant Funding Can Affect Equity

The use of grant funds for infrastructure that is subject to a DCP affects the equity of cost sharing. Where future grant funds are applied to DCP items, the grant revenue effectively subsidises (or offsets) cost proportions to be met by existing ratepayers. This creates inequity with landowners who retain their obligations via the calculated DCP levy.

Conventional infrastructure funding methods available to Council include rate revenue, grant funds and borrowings. These funding arrangements distribute costs across the whole community based on recognised methods, and maintain flexibility for Council to vary rates and priorities on an annual basis without impacting equity between those landowners that do, and those landowners that do not have a DCP contribution obligation.



Actual Lot Yields

The actual annual lot generation is relevant to:

- the cost of administrative overheads shared between relatively few landowners (efficiency); and
- market variability which makes it difficult to reliably forecast long-term yields and hence difficulty in reliably forecasting actual revenue and infrastructure provision requirements.

An historical yield of around 10 lots per year involves a remarkably small number of landowners in context of a DCP.

Alternative Provisioning Arrangements

The alternative to a DCP involves utilising the Shire's *Integrated Planning Framework* as illustrated at Attachment Two. The hierarchy of planning and provisioning documents enable a coordinated approach to strategic infrastructure and service provision throughout the Shire. That is, capital works and services are planned on a 10-year planning horizon, addressed through internal resourcing plans on a 4-year basis and provisioned through annual budgeting progresses. The framework recognises the full range of funding sources including rate revenue, interest, borrowings, statutory fees, and grant funding.

Conclusion and Recommendations

Having regard for the considerations set out above, GPA recommend the Shire not proceed with a DCP based on the following:

- The limited actual annual lot production since 2009;
- Difficulty in reliably forecasting strong growth rates over the next 10 years – with corresponding difficulties in forecasting DCP revenue and actual infrastructure requirements;
- The disproportionately high administrative costs that would be borne by a limited number of landowners;
- Inequities caused where grant revenue offsets costs for existing residents only;
- Limited flexibility allowed by a DCP to alter infrastructure plans and priorities; and
- The corporate strategic integrated planning framework available to, and utilised by the Shire.

GPA recommends community infrastructure be provisioned through the *Integrated Planning Framework*, utilising the established corporate planning and budgeting processes available to the Shire.

June 2017



ATTACHMENT ONE

ANALYSIS OF DCP PAYMENT OBLIGATIONS

Extract from DCP Project – Discussion Paper 3

	SCENARIO	PAYMENT OBLIGATION?	REASON
SUBDIVISION			
1	New greenfield subdivision creating new lot for new house.	YES	The new lot will contribute to demand for community infrastructure. Rates have not previously been incurred for the lot.
2	Subdivision of a lot within an established area, creating a lot for an additional house.	YES	As with above, the new lot will create new demand for community infrastructure and rates have not previously been incurred for the lot.
3	Subdivision of a lot containing existing dwellings – enabling each existing dwelling to be on its own land title.	NO	The subdivision does not increase the number of dwellings and does not create new demand for community infrastructure.
4	Re-alignment of property boundaries between existing properties.	YES and NO	If the subdivision process itself does not increase the dwelling yield, then no, payment is not required. If the boundary re-alignment enables one of the lots to achieve sufficient land area to accommodate more dwellings than previous, then yes – payment is required.
5	Amalgamation of property.	YES and NO	As with above, if the process of amalgamation serves to increase the eventual number of dwellings over the combined area, then new demand is created for community infrastructure and payment is required.
DEVELOPMENT			
6	Construction of a new dwelling on an existing vacant lot.	NO	The property has previously paid rates and the lot was previously created for the purposes of facilitating development.
7	Construction of more than one dwelling on an existing vacant lot.	NO	As with above, the lot was previously created and zoned with the intention of facilitating the development, and development at this time does not create demand beyond that previously expected.
8	Demolition of an existing dwelling and construction of a new dwelling.	NO	The redevelopment will not result in an increase in the number of dwellings, and consequently, there is no increase in demand for community infrastructure.
9	Extensions to an existing residence.	NO	The works does not increase the demand for community infrastructure.
10	Construction of any home where payment has previously been made.	NO	Payment has already been made for the demand forecast to be created by the property.



ATTACHMENT TWO

SHIRE OF CHITTERING – INTEGRATED PLANNING FRAMEWORK

The Shire maintains an integrated planning framework that underpins its strategic approach to core business areas. The framework is summarised in the figure below.



Source: Shire of Chittering Corporate Business Plan 2015 - 2019

Utilising the framework above, the Council ensures a sound and coordinated approach to strategic infrastructure and service provision throughout the Shire. That is, capital works and services are planned on a 10-year planning horizon, addressed through internal resourcing plans on a 4-year basis and provisioned through annual budgeting progresses. The framework is able to recognise the full range of funding sources including rate revenue, interest, statutory fees, development contributions (DCPs) and grant funding.

LOTS 1 & 2 TEA TREE ROAD, BINDOON

SHIRE OF CHITTERING LOCAL SCHEME AMENDMENT NO. 56



SHIRE OF CHITTERING TOWN PLANNING SCHEME NO. 6

AMENDMENT NO. 56

LOTS 1 & 2 TEA TREE ROAD, BINDOON
SHIRE OF CHITTERING

PREPARED FOR
MAROU PROPERTY DEVELOPMENTS PTY LTD

BY
WHELANS TOWN PLANNING

July 2016

SHIRE OF CHITTERING
TOWN PLANNING SCHEME NO. 6

AMENDMENT NO. 56

LOTS 1 & 2 TEA TREE ROAD, BINDOON

SCHEME AMENDMENT CONTENTS

1. RESOLUTION 4
2. SCHEME AMENDMENT REPORT 6
3. EXECUTION 33

APPENDICES

Appendix 1	Land Capability Assessment
Appendix 2	Opportunities and Constraints Plan
Appendix 3	Spring Flora & Vegetation Survey
Appendix 4	Structure Plan
Appendix 5	Bushfire Management Plan
Appendix 6	Land Capability for On-site Effluent Disposal

PLANNING AND DEVELOPMENT ACT 2005
RESOLUTION TO ADOPT AMENDMENT TO LOCAL PLANNING SCHEME

SHIRE OF CHITTERING
TOWN PLANNING SCHEME NO. 6

AMENDMENT NO. 56

RESOLVED that the Council, in pursuance of Section 75 of the Planning & Development Act 2005, amend the above local planning scheme by:

1. Rezoning part of Lot 1 & all of Lot 2 Tea Tree Road, Bindoon from 'Agricultural Resource' to 'Rural Smallholdings' and amending the Scheme Map accordingly.

The Amend is complex under the provisions of the Planning and Development (Local Planning Schemes) Regulations 2015 of the following reason(s):

1. An amendment that is not consistent with a local planning strategy for the scheme that has been endorsed by the Commission;
2. An amendment that is not addressed by any local planning strategy.

Dated this _____ day of _____ 2016

CHIEF EXECUTIVE OFFICER

**MINISTER FOR PLANNING
PROPOSAL TO AMEND A TOWN PLANNING SCHEME**

LOCAL AUTHORITY	Shire of Chittering
DESCRIPTION OF TOWN PLANNING SCHEME	Town Planning Scheme No. 6
TYPE OF SCHEME	District Scheme
SERIAL NUMBER OF AMENDMENT	Amendment No. 56
PROPOSAL	To rezone Lots 1 & 2 Tea Tree Road, Bindoon from 'Agricultural Resource' to 'Rural Smallholdings', to facilitate development of the land in accordance with the 'Rural Smallholdings' zone.

SCHEME AMENDMENT REPORT

LOTS 1 & 2 TEA TREE ROAD BINDOON



Original timber posts set out on Lot 1 for vineyard (2012)

1.0 INTRODUCTION

This report presents a proposal to initiate a Town Planning Scheme Amendment to the Shire of Chittering Town Planning Scheme No. 6 (TPS 6). The proposal seeks to rezone Lots 1 & 2 Tea Tree Road, Bindoon ("the subject site") from "Agricultural Resource" to "Rural Smallholdings".

The report provides a description of the subject site, details of the proposal and town planning justification. A draft Structure Plan (Appendix 4) has been prepared as supporting information to this proposed Local Scheme Amendment. However formal Structure Plan approval is not being sought as part of this application to rezone the subject site.

1.1 Location

Lots 1 & 2 (formerly Lot 102) Tea Tree Road, Bindoon is situated within the Shire of Chittering approximately 7 kilometres south-west of the Bindoon townsite and approximately 85 kilometres north-east of Perth. **Figure 1** is a location plan of the subject site. The combined area of Lots 1 & 2 is approximately 483.9 hectares and the property has frontage to Tea Tree Road along the northern boundary of approximately 2,661 metres.

Tea Tree Road is presently a gravel road serving the large rural properties west of Bindoon. Brennan Road runs along the property's western boundary, however, the road is not formally constructed and is also a gravel road. **Figure 2** shows the cadastral boundaries and aerial view of the subject site.

1.2 Landownership

The (2) land parcels forming the subject site are in ownership of M & I Marouchtchak. The legal description and area of each land parcel is set out in Table 1 below.

Table 1. Land description and area of lots comprising subject site

Lot	Plan	Volume	Folio	Area (ha)
1	41201	2618	80	433.81
2	41201	2618	81	50.09
TOTAL				483.90

2.0 SITE CONTEXT AND DESCRIPTION

2.1 Existing Land Use and Background

The subject site has an area of 483.9 hectares and in the past it has been used for grazing with occasional cereal and lupin crops. Most of the land has been cleared for agricultural pursuits but there are some stands of remnant vegetation left on the property. The property is currently being used for grazing. Rows of *Tagasaste* have been planted in the past in the central area of the subject site by the landowner as supplementary stock feed.

In the last few years the landowner has put considerable effort into preparing the eastern side of Lot 1 in anticipation of developing a vineyard. This has included the construction of fencing, sinking of a bore and earthworks to establish a dam. The intention was that the eastern part of the subject site would remain as a lifestyle lot owned and maintained by the current owner, with the western side of the land sold as smaller rural lots to fund and invest in the vineyard. It has only come to the Landowners attention, at the beginning of 2016, that ambitions for the land were put in doubt with the realignment of the Perth-Darwin Highway. It would appear from the indicative alignment of the Highway that for the vineyard to continue the dam and fencing may need to be relocated at considerable cost.

2.2 Surrounding Context

The predominant surrounding land use is rural based, comprising of agricultural activities and rural residential living (refer to **Figure 3**). To the east of the subject land (excluding neighbouring Lot 4) many of the original rural properties in the area have been subdivided into predominantly 2.0 – 2.5 hectare lots supporting rural-residential living, with some larger 3 - 4 hectare lots within those developments. The neighbouring land uses to the south, north, east and west are predominantly large agricultural lots or undeveloped land containing remnant vegetation.

Lot 101 to the west has been recently rezoned to 'Rural Conservation' with approval for cluster rural residential development. On the opposite side of Tea Tree Road to the north is the new Parkwood Springs Estate which has been approved and subdivided into 4 hectare rural residential lots.

The subject site is strategically located to provide a transitional land use between 'Rural Conservation' and 'Agricultural Resource' land and the rural-residential living precincts to the east. This will be further discussed in the report as town planning rationale for the proposed rezoning to 'Rural Smallholdings'.

2.3 Opportunities and Constraints

A Land Capability Assessment (**Appendix 1**), was undertaken by Landform Research in May 2000. The assessment was based on field analysis on 3 May 2000, 48 soil auger holes, geological and hydrological mapping, knowledge of the area, aerial photography interpretation and published information.

Opportunities and constraints have been identified from the Land Capability Assessment. Opportunity exists to create a unique rural smallholdings development which is site specific and relevant to its local context. The following are some of the opportunities identified for the subject land:

Opportunities

- Proximity to Bindoon Townsite - The subject land is only 7 kilometres south-west of Bindoon townsite and all its services and amenities.
- Availability of Groundwater - The white sand filled valleys contain abundant accessible groundwater of high quality with the greatest volumes of groundwater being in the central east valley. The landowner currently has a licensed bore approved by Department of Water.
- Vineyard - Soils have potential for cottage and perennial horticulture, particularly on the eastern side where there is good sources of groundwater. The landowner has obtained a license from Department of Water to extract groundwater for the proposed vineyard in the north-east of the property however the exact location of this vineyard is dependent on the location of the Perth-Darwin Highway.
- Soils high in phosphorous retention - The presence of yellow sand with good phosphorous retention over most of the site is suitable for on-site wastewater treatment.
- Ridges Views - The form of ridges provide visual screening as well as aesthetical values such as views and cooling breezes in summer.

Constraints

- There are limited land and environmental constraints for the site which would preclude development of the site for rural smallholding land use.
- Soak/Dam - There is a small soak/dam near the eastern boundary which will limit development and setback of residences from the wetland area, for instance, nominal Department of Environment and Conservation 100m buffer for effluent disposal from soak/dam wetland.
- The exact future alignment of the Perth-Darwin Highway is not yet know and as such currently only the indicative alignment dictates the eastern boundary of the proposed change of zone over the subject site.

The main opportunities and constraints for the site are shown in **Appendix 2** Opportunities and Constraints plan.

2.4 Topography

The land varies from two main ridges at just over 210m AHD in the south east corner and 205m AHD in the central west dropping to 175m in a gentle valley in the south western corner and 163m on the central eastern boundary.

2.5 Geology and Soils

Quartz sands cover the majority of the property with leaching of sand to white sand occurring in the valleys. The main soil types found on the subject land are Leached Sand over Gravel, Leached White Sand, Yellow Sand and Ferricrete and Gravel, which are typical for its position in the landscape. These sands are described as free draining calcareous sand of high permeability.



(Above) Typical view of white sands found on the property

2.6 Hydrology

Groundwater

Groundwater drains from each catchment, which is defined by the ridges found on the subject land, with the greatest volume of groundwater in the central east valley. The landowner has stated that the groundwater bore on the property is at a depth of around 30 metres.

Surface Water

Surface drainage is minimal due to the permeability of the soil. The only natural expression of surface water within the development site is a small flow emanating from the soak/dam in the central east. The direction of flow is east and surface drainage ultimately enters into Lake Chittering about 3 kilometres to the east of the subject land. There is no evidence of surface salinity and the Land Capability Assessment concluded that it is unlikely that salinity will be an issue in the future even though the land has been excessively cleared.

Wetlands

There are no natural wetlands or sumplands within the subject site. As mentioned above, there is a soak or dam in the eastern portion of the development site which feeds into a series of soaks and a dampland on the neighbouring eastern property. For the subject land, infiltration at source is the dominant hydrological characteristic in the pre-development catchment.

2.7 Vegetation & Flora

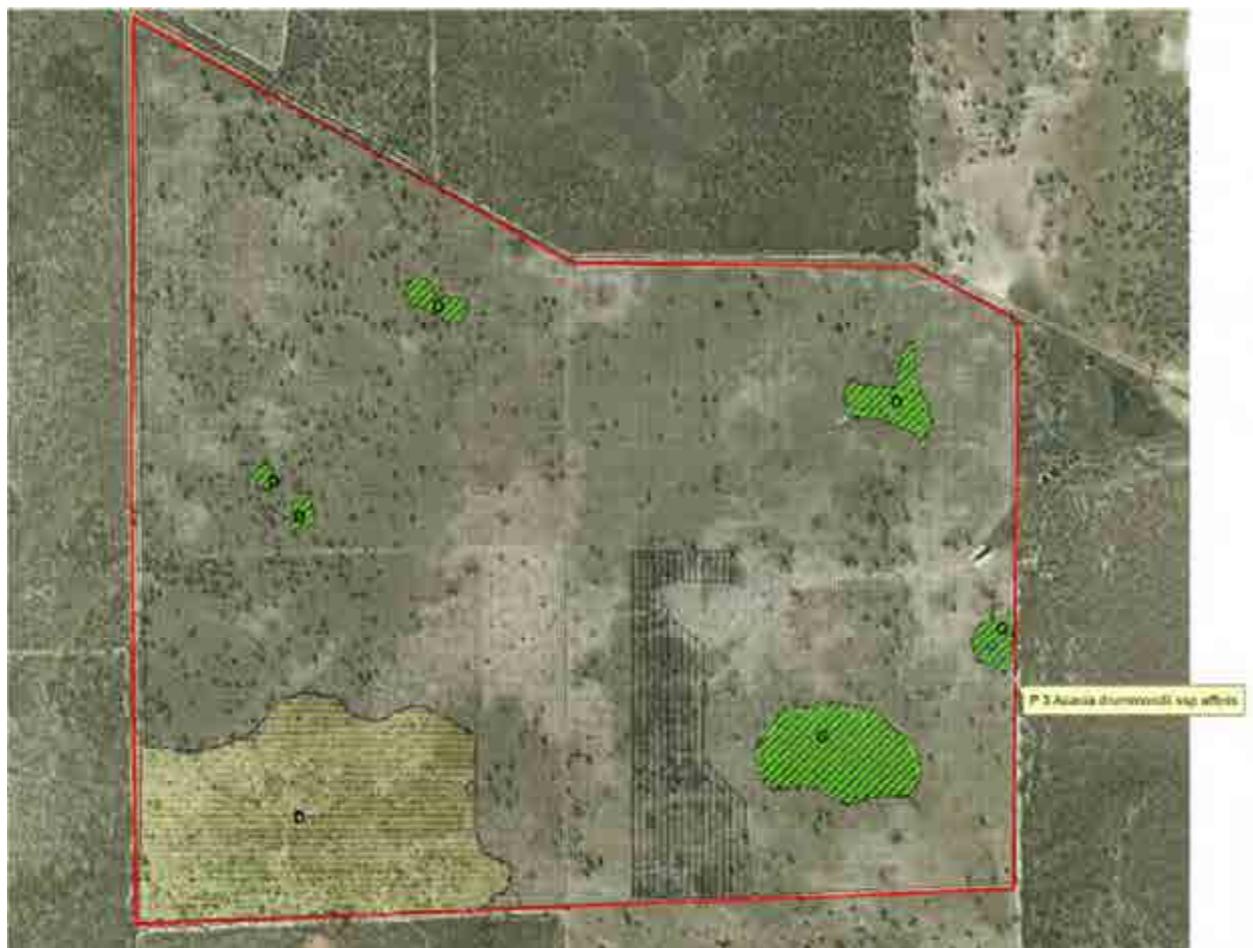
The subject land has been predominantly cleared apart from scattered remnant stands of trees. The main vegetation on the site can be described as tree remnants of Eucalyptus woodlands. Some of the gravel ridges have largely been left as remnant vegetation, but have been subjected to grazing to the extent that the vegetation diversity of species is limited both in numbers and density in most areas. The leached white sands in the west and south have been allowed to regenerate with there being evidence of some native species repopulating some areas of the property.

Landform Research in its Land Capability Assessment report made these comments on flora and vegetation on the property

“...Tagasaste has been planted in the central south on leached and yellow sands. The main vegetation on the site are tree remnants of Eucalypt woodlands. The following partial community types are represented by scattered Eucalypts and taller shrubs: Jarrah – Marri (Eucalyptus marginata, E. calophylla) Woodland occurs on the ferricrete/gravel and duricrust, grading into Jarrah Woodland where duricrust becomes significant and the soil more shallower. Marri Woodland was the dominant original vegetation on the yellow sand but changes to Pricklebark (E. tottiana) Woodland and remnant Banksia Woodland as the sand becomes more leached to the south west. Juncas pallidus occurs on wet pasture areas with the introduced Isolepis proliferata associated with the wet area around the soak in the central east. No evidence of dieback disease was noted.” [page 4].

The 2011 Spring Flora and Vegetation Survey (Bio Diverse Solutions, 2012) (**Appendix 3**) identified the presence of Priority 3 species (*Acacia drummondii* ssp *affinis*) in the eastern portion of the development site.

The Survey recommends that development is restricted in this area and the remnant vegetation area containing Priority 3 species *Acacia drummondii* ssp *affinis* is fenced to exclude stock in order to maintain habitat for the flora species. It should be noted that the draft Structure Plan (**Appendix 4**) prepared does not propose any development in the eastern portion of the development site and therefore the P3 flora species in this area should be retained within a large lifestyle lot.



Location of Priority 3 Flora (*Acacia drummondii* ssp *affinis*) in the eastern portion of the subject site



(Above) View of artificial re-growth Tagasaste rows near the central part of the site used to supplement livestock feed

(Below) Typical parkland cleared areas of the subject site with remnant eucalyptus trees



2.8 Fauna

The only remnant vegetation on the development site is the scattered trees and native vegetation pockets on the ridges. Due to the clearing of the land there is limited natural habitat for fauna. The trees on the development site potentially provide habitat for birds, however, no Carnaby Black Cockatoos were observed during site inspections.

Wherever possible, significant healthy trees will be preserved as part of development of the site. Kangaroos are frequent and reptiles are likely to be found on the site, including skinks, goannas, snakes etc that are local to the area. Feral animals such as rabbits and foxes are also likely to be found on the development site.

Plantings and revegetation can form linkages between remnant pockets of vegetation and to the more substantially remnant vegetation on surrounding neighbouring properties. It is likely that the development site attracts fauna that migrates between the surrounding remnant vegetated areas that have been assessed as important biodiversity areas under the Shire's Biodiversity Strategy.

2.9 Indigenous & European Heritage

Indigenous Heritage

A search of the Department of Indigenous Affairs (DIA) Aboriginal Heritage Inquiry System indicates there are no registered Aboriginal Heritage sites within the development site.

It is important to note that the database of heritage sites held by the DIA is not comprehensive and there exists the potential for unknown sites of Indigenous heritage significance to be located inside or within close proximity to the subject land.

Archaeological monitoring is recommended for any eventual excavation works as part of subdivision and development. The process for protecting Indigenous heritage sites and considering proposals that may impact a known site is set out under the *Aboriginal Heritage Act 1972*. The Act protects all Aboriginal sites in WA whether they are known to the DIA or not.

European Heritage

There are no places or sites of cultural significance within the subject site area under the Shire of Chittering Municipal Heritage Inventory and State Heritage Register.

3.0 KEY PLANNING FRAMEWORK

3.1 SPP 2.5 'Agricultural and Rural Land Use Planning'

For lot sizes in Rural Smallholdings, SPP 2.5 sets out a range of 4ha – 40ha in size. The Policy recommends that a Rural Smallholding zone focus on providing rural living and rural lifestyle land use. SPP 2.5 generally requires proposals for Rural Smallholdings to be consistent with Local Planning Strategies and located in areas where bushfire risk is not extreme and there are no significant topography, environment, or servicing constraints. The subject site is well suited for Rural Smallholdings zone and this will be further discussed in the report, however in summary and as per section 5.6 *Rural living precincts* of SPP 2.5:

- the precinct will not conflict with rural land use activity or reduce the primary production potential of adjoining or nearby land;
- the extent of proposed rural living settlement is guided by existing land supply and take-up and population projections;
- the precinct is predominantly cleared of remnant vegetation or the loss of remnant vegetation through clearing for building envelopes, bushfire protection, access and fencing is minimised and environmental assets are not compromised;
- the land within the precinct is capable of supporting the development of a dwelling(s) and is not located in a flood prone area;
- the land within the precinct is not subject to a buffer from an adjoining land use or the impact(s) from the buffer can be managed;
- the lots can be serviced by constructed road/s capable of providing access during all weather conditions, including access and egress for emergency purposes;
- it can be demonstrated that the precinct is not in an extreme bushfire risk area and any lesser bushfire risk can be minimised and managed without adversely affecting the natural environment; and
- in areas of moderate bushfire risk, dwellings will be required to be constructed to Australian Standard 3959 Construction of Buildings in Bushfire-Prone Areas (AS 3959) and separation distances are to comply with relevant guidelines for bushfire protection.

3.2 SPP 5.4 'Road and Rail Transport Noise and Freight Considerations in Land Use Planning'

This Policy seeks to protect the community from unreasonable levels of transport noise by establishing a standardised set of criteria to be used in the assessment of

developments close to transport corridors and to protect freight corridors from incompatible urban encroachment.

In relation to this scheme amendment and future subdivision in line with the proposed Structure Plan, the 5 – 6 ha lots proposed for development will be set on the western side of the subject site. As per clause 5.6 of SPP 5.4 this is an appropriate form of noise mitigation to separate noise-sensitive land uses from the potential noise generated by the Perth-Darwin Highway by a distance of greater than 900m.

Any noise sensitive buildings set on the large lifestyle lot will also require a set back from the Highway of no less than a minimum 300m limit. It is anticipated that noise studies will only need to be conducted as part of the planning application process for noise sensitive buildings constructed closer to the Perth-Darwin Highway inside the 300m offset or in the event of future structure planning on the large lifestyle lot.

3.3 Shire of Chittering Local Planning Strategy 2004

The Shire of Chittering Local Planning Strategy 2004 (LPS) was endorsed by the Shire of Chittering and Western Australian Planning Commission as a planning instrument to guide land uses and subsequent development within the Shire for the period 2001 – 2015.

The LPS identifies the subject site as suitable for 'Rural Retreat – Priority Development Area' development (with minimum lot size of 10 hectares). However, as will be discussed under heading 4.1 of this report, the subject site is considered better suited for 'Rural Smallholdings'.

3.4 Shire of Chittering Draft Local Planning Strategy Update 2010

The Shire of Chittering Draft Local Planning Strategy Update 2010 proposes modifications to the LSP 2004. It is noted that Lots 1 & 2 Tea Tree Road are retained under the draft Local Planning Strategy Update 2010 as 'Rural Retreat'. Should this proposed local scheme amendment be supported, the draft LSP will require updating to reflect proposed 'Rural Smallholdings'.

3.5 Shire of Chittering Town Planning Scheme No. 6

The subject land is currently zoned 'Agricultural Resource' under the Shire of Chittering Town Planning Scheme No. 6. The proposal is to rezone the subject land from 'Agricultural Resource' to 'Rural Smallholdings'. A Structure Plan is required as a prerequisite to subdivision and/or development in order to provide an appropriate planning framework to guide decision making regarding subdivision and/or development approval.

3.6 Local Planning Policy No. 21 – Fire Management

This policy applies to all land zoned Rural Residential, Rural Retreat and Rural Smallholdings under TPS 6. A Bushfire Management Plan is to be prepared in accordance with the Policy for the proposed ODP. A Bushfire Hazard Assessment is

required for the proposed Local Scheme Amendment and this is provided for in **Appendix 5**.

3.7 Local Planning Policy No. 32 – Structure Plans

For the rezoning and development of the subject site, the policy requires preparation of a Structure Plan which considers the proposed subdivision of land and assembly of elements including road layout, configuration of proposed lots, provision of infrastructure, public open space and fire risk assessment/management.

Under the policy, a minimum lot size of 5 hectares is applied to the Rural Smallholdings zone. A draft Structure Plan is provided with this scheme amendment as supporting information to demonstrate how the subject site could be subdivided/developed under a 'Rural Smallholdings' zone. An indicated location of the Perth-Darwin Highway has been added onto this plan acknowledging the proposed location of the Highway. The alignment is at this stage indicative and will be formalised through further consultation with the Main Roads Department (MRWA).

4.0 PLANNING RATIONALE

4.1 Local Planning Strategy 2004 (LPS)

The Shire of Chittering LPS identifies the subject site as future 'Rural Retreat', however, the subject site falls outside designated Rural Retreat Precincts as per [Figure 8 in the LPS] (as shown in **Figure 4**).

The LPS identifies Small Ruralholding Precincts to be located further away from Bindoon townsite as per [Figure 7 in the LPS] (as shown in **Figure 5**). It is considered that the subject site has merit for rezoning to 'Rural Smallholdings', being in relative proximity to Bindoon townsite.

The Shire's LPS identifies Rural Residential Precincts as per [Figure 6 in the LPS] (refer to **Figure 6**). The subject site falls within a portion of the Chittering Heights Estate/Odelon Estate Precinct with the balance of the subject site abutting this Precinct and the Country Club Estate Precinct to the north-east.

The proposed Scheme Amendment for the subject site provides for a suitable transition of rural residential to the east and larger agricultural lots to the west (including the western neighbouring 'Rural Conservation' lot).

4.2 Suitability of Subject Site for Rural Smallholdings

Vegetation Clearing

The subject site has historically been cleared for grazing and does not form part of environmentally sensitive areas as identified in the Shire of Chittering Local Biodiversity Strategy.

Site Accessibility & upgrading of Tea Tree Road

The subject site is accessible via Tea Tree Road, which has been sealed up to Parkwood Springs Estate providing bitumen access to that development. Further west of Parkwood Springs Estate Tea Tree road is trafficable but constructed gravel. Brennan Road along the western boundary of the subject site is also trafficable gravel road.

The proposed 'Rural Smallholdings' zone will provide opportunity to create a rural smallholding subdivision over the subject site, which will in turn require the upgrading (to bitumen standard) of Tea Tree Road along the frontage of the subject site. Brennan Road potentially can remain as a gravel trafficable road providing a secondary access point to the subject site. The primary access to the subject site would be Tea Tree Road.

Part of the upgrading of Tea Tree Road will require extension of the bitumen seal from Parkwood Springs Estate to the north-east corner of the subject site. Of particular significance will be the need to upgrade the drainage crossing of the natural surface drainage line on the northern side of Tea Tree Road to the southern wetland area in neighbouring Lot 4 to the east. At present the water flow across Tea Tree Road is uncontrolled and creates a water hazard and erosion issue.



Natural surface water drainage across Tea Tree Road opposite wetland area in Lot 4 – image taken in summer

Upgrading of the road by the developer would necessitate installation of a suitable culvert to allow the natural surface drainage to pass under Tea Tree Road to the wetland within Lot 4.



Upgrade to Tea Tree Road as part of Parkwood Springs Estate development

Suitability of Small Ruralholding Lot Size

The subject site is generally within a transitional area between rural residential development to the east and agricultural lots to the west. The proposed 'Rural Smallholdings' zone would provide opportunity for minimum lot size of 5 hectares, which would not be out of keeping with the character of the area. To the east of the development site there are existing and planned rural residential developments.

Parkwood Springs Estate to the north is zoned 'Rural Residential' with lot sizes of 4 hectares. The neighbouring land to the west (Lot 101 Tea Tree Road) is zoned 'Rural Conservation' with a WAPC conditional approval for (cluster subdivision, providing for lot sizes of 5000m²).

Market sounding indicates that the community prefers lot sizes in this locality to be generally around 1 – 5 hectares. For the majority, larger lot sizes above 5 hectares are not preferable, due to issues of land maintenance.

Further, lot sizes around 4 – 5 hectares are sufficient to provide a rural lifestyle and amenity. From a perspective of landowner maintenance (i.e. sustainable land management practice), a 4 - 5 hectare lot size (i.e. generally the size of a primary school site) is reasonably manageable, for inexperienced prospective landowners seeking a *tree change*, or those wishing to downsize.

Generally speaking larger lot sizes (i.e. 10 hectares or greater) attracts less market and community demand. Accordingly, the Proponent requests the 'Small Ruralholdings' zone in lieu of a 'Rural Retreat' zone, to create opportunity to provide a more appropriate lot product to meet community demand and expectations.

Land Supply and Population Growth

As per the Shire of Chittering *Strategic Community Plan 2012-2022* the population of the Shire is predicted to double by 2026. Added to this will be a significant increase in the range of the 35-69 years of age cohort. This will increase demand for a variety housing that will allow tree change, low land maintenance lifestyle options. The *Strategic Community Plan* acknowledges that future lifestyle choice for the increased population will require an increased availability of varied lot sizes to meet the needs of the community now and into the long term.

Added pressure is presumed to be generated on the local land availability with the development of the Perth-Darwin bypass and the increased employment opportunities generated by the developing Muchea Employment Node.

Perth-Darwin Highway

The Perth-Darwin Highway is expected to be completed in approximately 2019. With the creation of this new bypass opportunities will arise in the form of improved access to the subject site and added points of egress in the event of emergency evacuation due to bushfire. There is also the added connectivity to the Bindoon Townsite the future Muchea Employment area and the reduced travel time into the Perth metropolitan area.

At the time of incorporation of the Perth-Darwin Highway alignment into the scheme amendment document (February 2016) the exact alignment had not been finalised. As such the exact eastern boundary of the proposed 'Small Rural Holdings' zone cannot be determined until the final road layout is formalised. All land within the proposed road reserve and to the east of the Perth-Darwin Highway alignment will not change from the current Agricultural Resource zone.

4.3 Opportunities for Ecological Linkages

The subject site is in a unique location between pockets of environmentally sensitive areas as identified in the Shire of Chittering Local Biodiversity Strategy. In particular, the subject site is between Indicative High Conservation Value Areas (IHCVA) to the north, east, south and west as shown in **Figure 7** in proximity to subject site.

As part of structure planning, there is opportunity to investigate local ecological links or biodiversity corridors to join these IHCVAs for the benefit of fauna as encouraged in the Shire of Chittering Local Biodiversity Strategy. The Proponent's preference is for the ecological links to be provided for within proposed public open space (POS) with management order to the Shire of Chittering. However, this would be subject to further consideration.

4.4 Other Considerations

If the subject site were subdivided/developed as 'Rural Retreat' only, the maximum lot yield that could be achieved would be (44) rural retreat lots as shown in **Figure 8**. Notwithstanding issues of commercial viability (i.e. 10 hectare lots require substantially greater servicing and road infrastructure requirements), subdivision/development at 10 hectares on a broad scale is an inefficient use of land and resources.

Although commercial viability is generally not a town planning consideration, the viability of a proposal should be fundamentally important in any town planning decision making.

The objectives of the 'Rural Smallholdings' zone are set out in Clause 4.2.4 under the Shire of Chittering TPS 6, which states:

"To preserve productive land suitable for intensive horticulture and other compatible productive rural uses in a sustainable manner.

To protect the landform and landscape values of the district against despoliation and land degradation.

To provide lots with a minimum size of 5ha."

The draft Structure Plan demonstrates the suitability of the subject site to meet the objectives of the 'Rural Smallholdings' zone, in that:

- (i) The proposed lifestyle lot (in the draft structure plan) is site responsive and takes advantage of the good agricultural soils and groundwater supply on the eastern side of the property, for proposed horticultural use (i.e. vineyard with potential tourist use). The larger lot to the east also acts as a buffer from potential noise associated with the Perth-Darwin Highway.
- (ii) 'Rural Smallholding' lifestyle lots (i.e. 5 hectares in size) respond to community demand and expectations. The lots provide opportunity for prospective landowners to plant trees and vegetation (or manage re-growth of areas within the lot), as an overall lot size of 5 hectares is not considered too large an area for inexperienced landowners to manage.
- (iii) Providing an attractive and interesting rural development for people to live in, particularly with the development of a vineyard on the larger eastern lot (to be retained by the landowner) with potential for future tourist accommodation and function/reception overlooking an artificial lake (re-contouring of the existing soak/dam) to create a sense of community and identity.
- (iv) Potential delivery of an attractive proposed Public Open Space (POS) network in the structure plan could incorporate public amenities such as walking and bridle trails, not just for the exclusive use of immediate residents in the structure plan.
- (v) The proposed 'Rural Smallholdings' is considered appropriate given that the majority of the subject land has already been historically cleared for grazing and there are no significant biodiversity areas within the subject site. Neither would the proposal require extensive and significant clearing of existing vegetation for building envelopes as the site has already been cleared and 5 hectare lot sizes allow areas outside of the nominated building envelope (i.e. 3,000m²) to potentially re-grow, subject to bushfire management.

- (vi) Smaller rural lot sizes work better on cleared land creating opportunities for rehabilitation and reduced risks associated with bush fires, compared with smaller lots in more densely vegetated areas.

Extinguishment of use for Extractive Industry - Sand

In circa early 2010 the Department of Mines & Petroleum (DMP) sought permission from the landowner to carry out geological tests within the subject site to investigate the extent and quality of sand deposits found within the subject site. DMP confirmed the success of the geological testing and Main Roads WA (MRWA) entered into agreement with the landowner to extract sand from the subject site under the *Public Works Act 1902*. Around late 2010, MRWA extracted approximately 70,000 – 80,000 cubic metres of sand from the south-east portion of the subject site for its road upgrade works in the Bindoon and Chittering area. The MRWA south-east extraction area and access tracks are clearly visible in Figure 2.

In May 2012 the landowner sought development approval to carry out Extractive Industry – Sand over a portion of the subject site. At its Meeting held 15 August 2012 the Shire of Chittering refused the development application on the grounds of strong community objections relating to traffic, noise, dust, proximity to conservation category wetland [within neighbouring Lot 4] and that the subject site is within a *“...predominantly rural lifestyle area the subject site is identified as high priority development area for the purpose of rural retreat....”*.

In September 2012 the landowner lodged an application for review by State Administrative Tribunal (SAT) against the Shire’s refusal decision. Following SAT mediation, the Shire of Chittering reconsidered its decision and at its Meeting held 20 March 2013, Council resolved to grant planning approval subject to conditions. The Extractive Industry – Sand development approval for the subject site is valid until 30 June 2022, after which time a renewal of the use would be required.

Subsequently under the current ‘Agricultural Resource’ zone, the subject site can be utilised for Extractive Industry – Sand. However, rezoning the subject site to ‘Rural Smallholdings’ would mean that Extractive Industry use is a prohibited (“X”) use, under the Shire of Chittering Town Planning Scheme No. 6. The local community has expressed previous strong concern in relation to use of the subject site for Extractive Industry, with [rural residential type] land use being the preferred use of the subject site, if given an option between the two land use categories. The current proposal to rezone the subject site to ‘Rural Smallholdings’ effectively would extinguish the ability of the subject site to be used for Extractive Industry in future. Notwithstanding, the landowner is aware that the ‘Rural Smallholdings’ rezoning will essentially close-the-door on any ability to undertake Extractive Industry land use on the subject site. In terms of sourcing basic raw materials, there are potentially other locations within the Shire of Chittering for extractive industry (sand) in less sensitive areas.

It should be noted that while the subject land is identified as an Extractions area under State Planning Policy 2.4 *Basic Raw Materials* it is not considered a Priority Resource Location and therefore is not of regional significance in terms of future basic raw materials extraction.

5.0 BUSHFIRE MANAGEMENT PLAN

A Bushfire Hazard Assessment (BHA) has been undertaken to inform the proposed Local Scheme Amendment and draft Structure Plan design and recommends appropriate bushfire management response and measures. The Bushfire Management Plan was reviewed to reflect new legislation and updated in June 2016.

Overall, the Bushfire Management Plan (Appendix 5) including BHA categorises the subject site as having an 'Extreme - Moderate' Bushfire Hazard level. The Bushfire Management Plan recommends a number of fire management measures be undertaken to address the risk of bushfire to property and persons within and adjacent to the ODP area. The risk of bushfire is to be generally managed in terms of implementation of the following:

- A detailed Bushfire Management Plan (BMP) being prepared and endorsed at the subdivision stage. The subdivision will comply with the bushfire protection criteria Acceptable Solutions as per the newly released Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015);
- Ensure that dwellings are built to BAL/AS3959-2009 Building Standards if 100m setback cannot be achieved within their property from Woodland Type B;
- Section 70A notifications on title advising prospective residents in areas which are affected by the Bushfire Management Plan;
- Identification and maintenance of APZ's (i.e. low fuel loading) of 20 metres of any habitable building in areas adjacent to or within proximity to 'extreme - high fire risk areas' as identified in the Fire Management Plan;
- Construction of road system which provides for two access points onto Tea Tree Road and an Emergency Access Way and Fire Service Access onto Brennan Road in the west and to southern firebreaks (in adjacent properties) to the south and meet the Acceptable Solution;

The subdivision will comply with an Acceptable Solution by applying either a 100m Hazard Separation Zone (HSZ) at the interface of the building and the bushfire hazard or a setback associated with BAL construction and AS3959-2009 as outlined in the BAL Contour Map outlined in attached BMP. It has been advised that no higher BAL allocation than BAL 12.5 needs to be applied to the dwellings.

6.0 INFRASTRUCTURE & SERVICING

In 2009 SMEC Urban civil engineering consultants reviewed the subject site for potential to accommodate proposed rural smallholdings development of the property and concluded that there are no significant constraints that would preclude development of the subject land in terms of servicing for a rural smallholdings development. With the current subdivision and development occurring at Parkwood Springs Estate, services have been extended and are now closer to the subject site than beforehand.

6.1 Earthworks

The subject land has no severely sloping areas which would present any significant engineering constraints for road construction. The proposed road levels will be designed to match (where practical) the existing ground levels to minimise earthworks. No earthworks are proposed to be undertaken to the proposed lots.

Some earthworks will be required for the new subdivision roads and strategic firebreak access routes within the subject site to accommodate subdivision. Aside from road works, consideration may be given to improving the storage capacity of the existing soak on the property for water supply (e.g. vineyard) and aesthetic purposes. This would require separate development approval from the Shire depending on the nature of the works.

There may also be a requirement for excavation within the building envelope areas for the construction of dwellings and on-site effluent disposal, depending upon ease of excavation. This would be subject to individual geotechnical investigations and assessment for development areas.

6.2 Local Roads

Tea Tree Road is a single carriageway road providing existing access to the subject site. Tea Tree Road is currently a constructed bitumen road up to the Parkwood Estate (Lot 9502) and west onwards the road is a trafficable gravel road. As part of subdivision and development of the subject site, the section of Tea Tree Road along the frontage of the subject site would need to be constructed to a standard of the Shire's satisfaction.

Brennan Road abutting the western boundary of the subject site is a single carriageway trafficable gravel road, which extends from Tea Tree Road and terminates at the south-west boundary of Lot 2. This road would not be required to be constructed to bitumen standard, however, as outlined in the Bushfire Management Plan, Brennan Road provides an alternative access route.

6.3 On Site Effluent Disposal – Nutrient Management

There is no reticulated sewerage in this area and it is proposed that wastewater management be accommodated by on-site effluent disposal units. Across the development site, the yellow sands and ferricrete soils that are found have high phosphate absorbing qualities. This is based on the level of sesquioxides and clay at depth and the depth to water tables. The leached white sands on the western ridges frequently overlies yellow sand, gravel and ferricrete at depths of approximately one metre.

All yellow sand, loam, gravel and duricrust soils on the subject site are capable of supporting conventional effluent disposal systems, with the exception of the leached white sands in lower lying areas mainly found in the eastern part of the development site, particularly around the soak. These are contained within the proposed larger eastern lot in the draft Structure Plan.

The Land Capability Assessment report recommends a 100m setback for on-site effluent disposal systems from the existing soak, however under the draft Structure Plan no lots are proposed within the eastern half of the subject site.

Late winter groundwater monitoring and laboratory soil testing confirms the site's suitability to support on-site effluent disposal. For more details on geotechnical and nutrient management (effluent disposal), refer to the Land Capability Assessment report (Appendix 1) and Land Capability for On-Site Effluent Disposal (Appendix 6).

6.4 Water Supply

There is no reticulated water supply in the nearby area and there are no plans to provide reticulated water to this area. Development on each proposed lot will provide a 120KI water storage tank for potable water.

Rainwater harvesting shall be in accordance with the Shire of Chittering Town Planning Scheme Clause 5.8.5 "Non-Potable Water Supply", whereby rainfall harvesting using rain surface runoff collection areas shall be as follows:

"Where rainfall is to be used as the predominate source for a water storage tank, the minimum collection area, in terms of rain surface runoff, to service the tank, is to be provided. The collection area will normally comprise of the roof area of structures on the lot and may include the dwelling, outbuildings and any other structure capable of collecting and directing water into the tank.

The size of the collection area is to be based on the following calculation:

Collection area (m²) = 120,000 divided by (0.85 x (local rainfall – 24mm))

Where:

- *Collection area (m²) is the minimum area for rain surface runoff that is required to service the water tank.*
- *120,000 is the minimum size of the water tank in litres (unless Council has determined an alternative size in accordance with the Scheme).*
- *0.85 is the efficiency of the collection (a minimum of 85% of the water will be collected).*
- *Local rainfall is the average annual mean rainfall measured in millimeters (mm) guided by the nearest collection point provided by the Bureau of Meteorology.*
- *24mm is the anticipated loss through absorption and wetting of materials based on 2mm a month."*

Projections using the WAPC rainfall catchment calculator and mean rainfall levels from the Bindoon area show that sufficient rain harvesting is possible to service the intended zone for both potable indoor/outdoor and firefighting water requirements. Adequate water supply will require a minimum 516m² roof surface area per lot for water harvesting.

6.5 Power

There is existing power supply infrastructure in the vicinity of the proposed development and the subdivision would be supplied with underground high and low voltage power, including provision of transformers and switchgear around the development site. The

required extensions and upgrades necessary to facilitate 'Rural Smallholdings' subdivision and development would be subject to consultations with the relevant servicing authorities at the time of subdivision.

6.6 Telecommunications

There is existing telecommunication infrastructure available along Tee Tree Road and preliminary consultation with Telstra by SMEC Urban indicates that it is possible to connect to this service. Additional cabling will need to be provided to service the subdivision.

6.7 Gas

Reticulated gas is not an available service within the area.

7.0 CONCLUSION

The proposed 'Rural Smallholdings' zone for the subject site is considered to be a better town planning outcome, compared with rezoning to 'Rural Retreat', which requires a minimum 10 hectare lot size. Although the subject site is identified under the current Shire Local Planning Strategy for 'Rural Retreat', it is considered a 'Rural Smallholdings' zone is more site specific and more responsive to its local context.

Rezoning the majority of the subject site to 'Rural Smallholdings' will provide the opportunity to create a commercially viable subdivision with minimum lot size of 5 hectares, as demonstrated in the draft Structure Plan accompanying this scheme amendment proposal as supporting information only. The portion of Lot 1 that will remain as 'Agricultural Resource' is dependent upon the final location of the Perth-Darwin Highway. This will need to be confirmed with the MRWA.

The benefits for the community of rezoning (and subsequent thereafter development) the subject site to 'Rural Smallholdings' include, but not limited to:

- Creation of 5 – 6 hectare lots which offer a different market product to Parkwood Springs Estate and compliment the nearby rural residential land uses to the east (with possible public open space ecological linkages);
- Generally provide a transitional land use between 'Agricultural Resource' lots to the south and west and rural residential land use to the north and east;
- Provide for proper and orderly settlement expansion in Bindoon to accommodate for population growth on land which has been predominantly cleared in the past for grazing, thereby having limited impact on biodiversity values to the local environment;
- Subdivision for settlement, of the [already cleared] subject site, would reduce pressure to set aside other lands for settlement expansion (to accommodate population growth), of which other lands may have more significant environmental values to overcome;
- Upgrading of Tea Tree Road to bitumen seal abutting the subject site, including bitumen road extension from Parkwood Springs Estate and the delivery of an appropriate culvert treatment for the wetland crossing in front of eastern neighbouring Lot 4, which would provide for a more controlled natural surface drainage crossing; and
- Currently under 'Agricultural Resource' zone, the subject site could be utilised for Extractive Industry – Sand. Rezoning of the subject site to 'Rural Smallholdings' means that Extractive Industry uses are a prohibited ("X") use under the Shire of Chittering Town Planning Scheme No. 6. The community has expressed previous concern in relation to use of the subject site for Extractive Industry, with [rural residential type] land use being the preferred use of the subject site, if given an option between the two land use categories.

Item 9.1.5

SHIRE OF CHITTERING
Local Scheme Amendment No. 56

Upon adoption of the 'Rural Smallholdings' zone, an application for Structure Plan would be required for approval as a prerequisite to subdivision and/or development of the subject site in accordance with the Shire of Chittering Town Planning Scheme No. 6.

PLANNING & DEVELOPMENT ACT 2005
SHIRE OF CHITTERING
TOWN LOCAL PLANNING SCHEME NO. 6
AMENDMENT NO. 56

The Shire of Chittering under and by virtue of the powers conferred upon it in that behalf by the Planning and Development Act 2005 hereby amends the above local planning scheme by:

1. Rezoning part of Lot 1 & all of Lot 2 Tea Tree Road, Bindoon from 'Agricultural Resource' to 'Rural Smallholdings' and amending the Scheme Map accordingly.

ADOPTION

ADOPTED for advertising resolution of the Shire of Chittering at the Ordinary Council Meeting held on _____ day of _____ 2016.

Shire President

Chief Executive Officer

Council Recommended/Submitted for Approval

Support for the submission to the Minister for Planning for approval by resolution of the Shire of Chittering at the Ordinary Council Meeting held on the _____ day of _____ 2016 and the Common Seal of the Shire of Chittering was hereunto affixed by the authority of a resolution of the Council in the presence of:

Shire President

Chief Executive Officer

WAPC Recommended/Submitted for Approval

Delegated under S.16
of the Planning and Development Act 2005

Date

Approval Granted

Minister for Planning
S.87 of the Planning and Development Act 2005

Date

SHIRE OF CHITTERING
TOWN PLANNING SCHEME No. 6

-Amendment No.



LEGEND

LOCAL SCHEME RESERVES

Major Road

ZONES

Agricultural Resource

Rural Residential

Small Rural Holdings

OTHER

Military Considerations

EXISTING ZONING

SCHEME (AMENDMENT) MAP

SCALE 1:30000



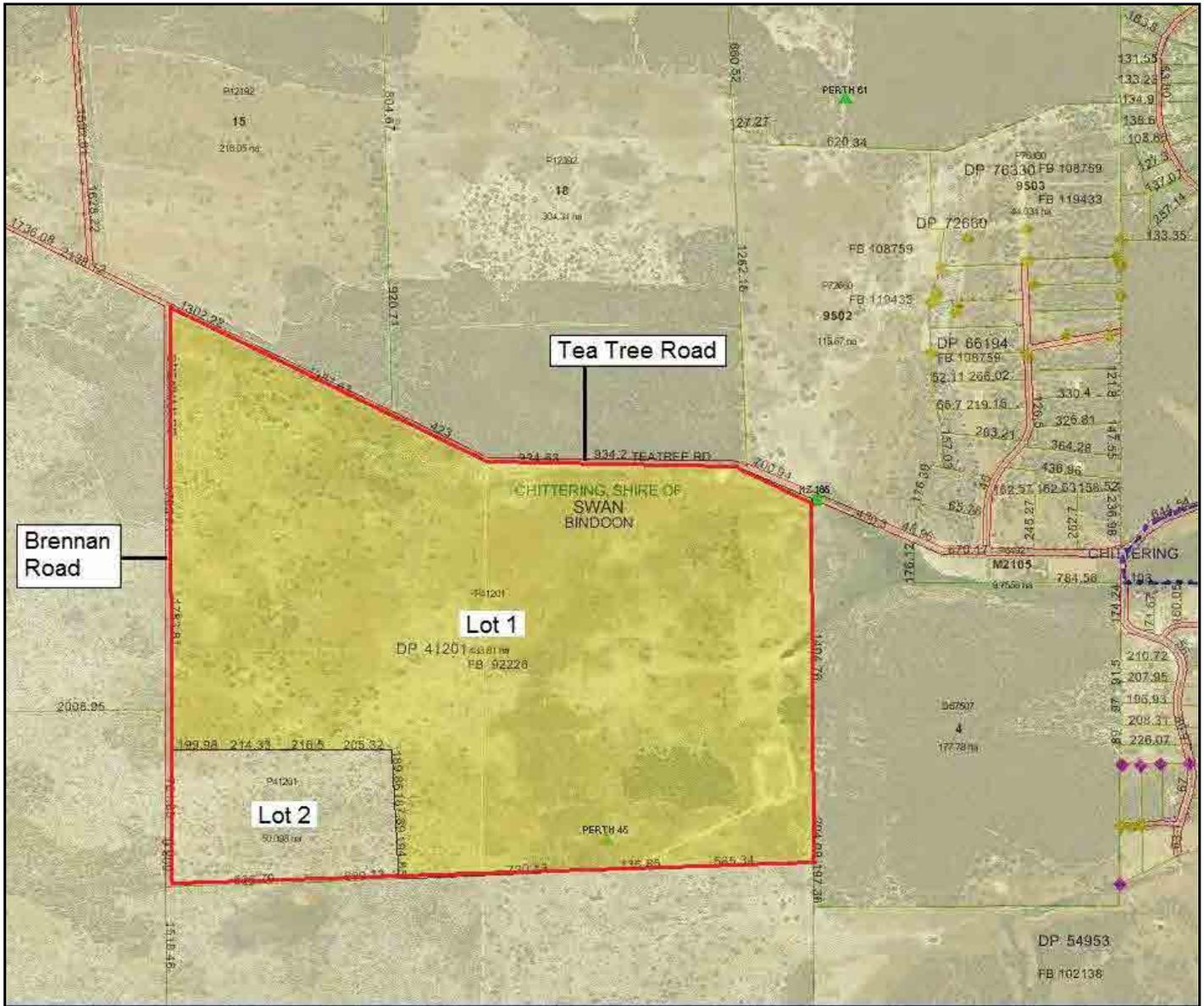
FIGURES

APPENDIX 1



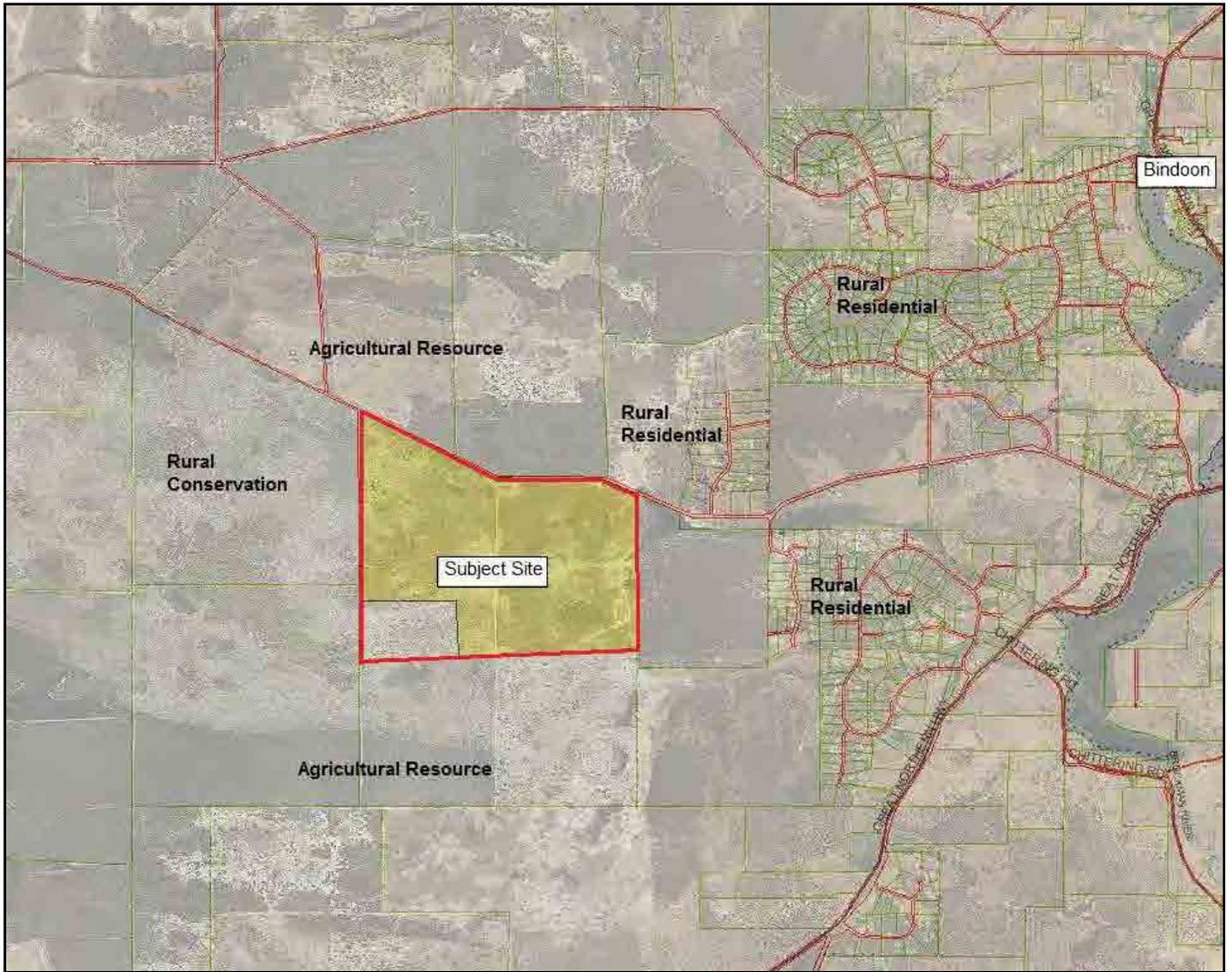
(Source: Streetsmart, 2013 - modified)

FIGURE 1
LOCATION PLAN



(Source: Landgate 2015 - modified)

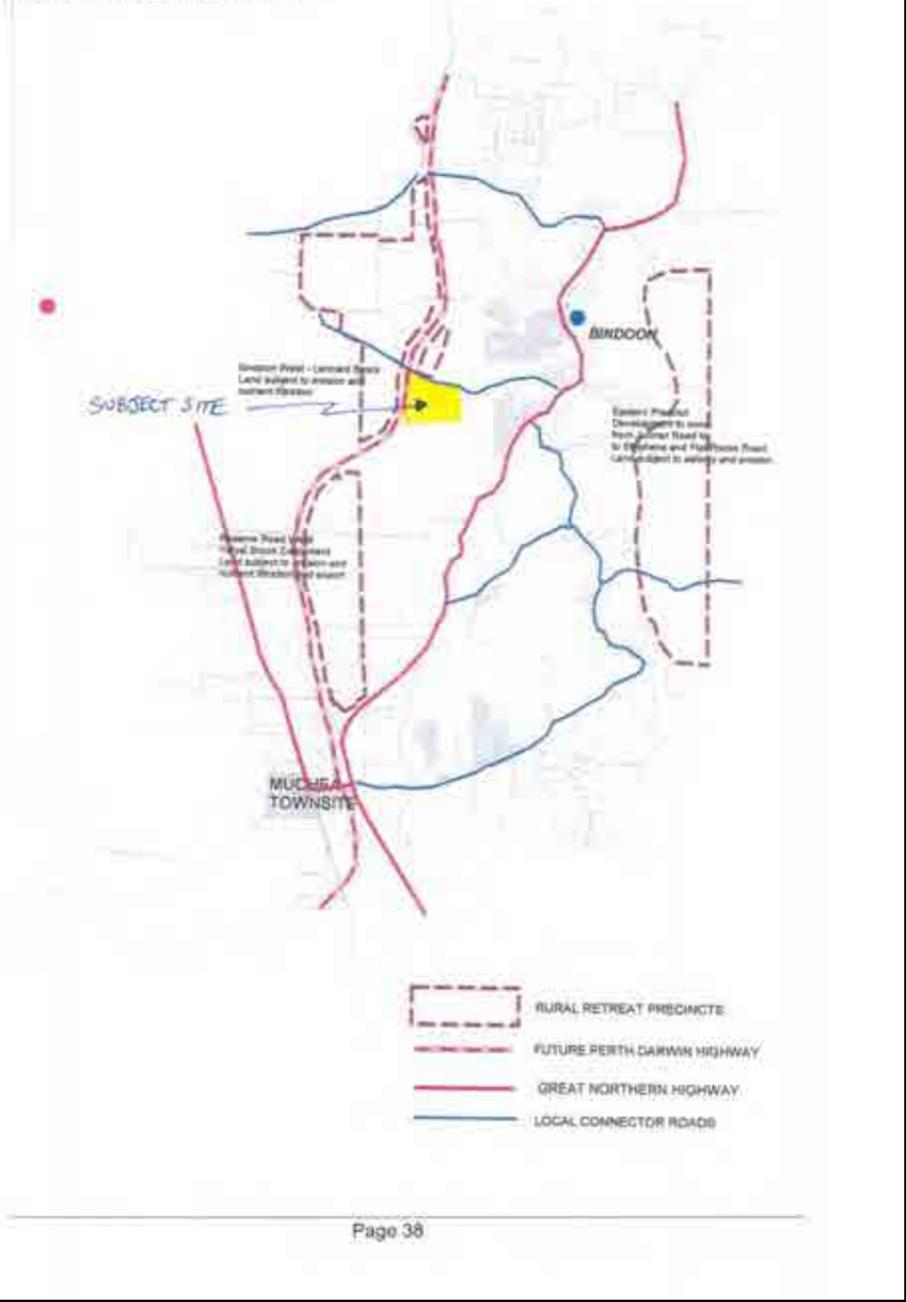
FIGURE 2
CADASTRAL & AERIAL VIEW



(Source: Landgate 2015 - modified)

FIGURE 3
SURROUNDING CONTEXT

Figure 8 – Rural Retreat Precincts

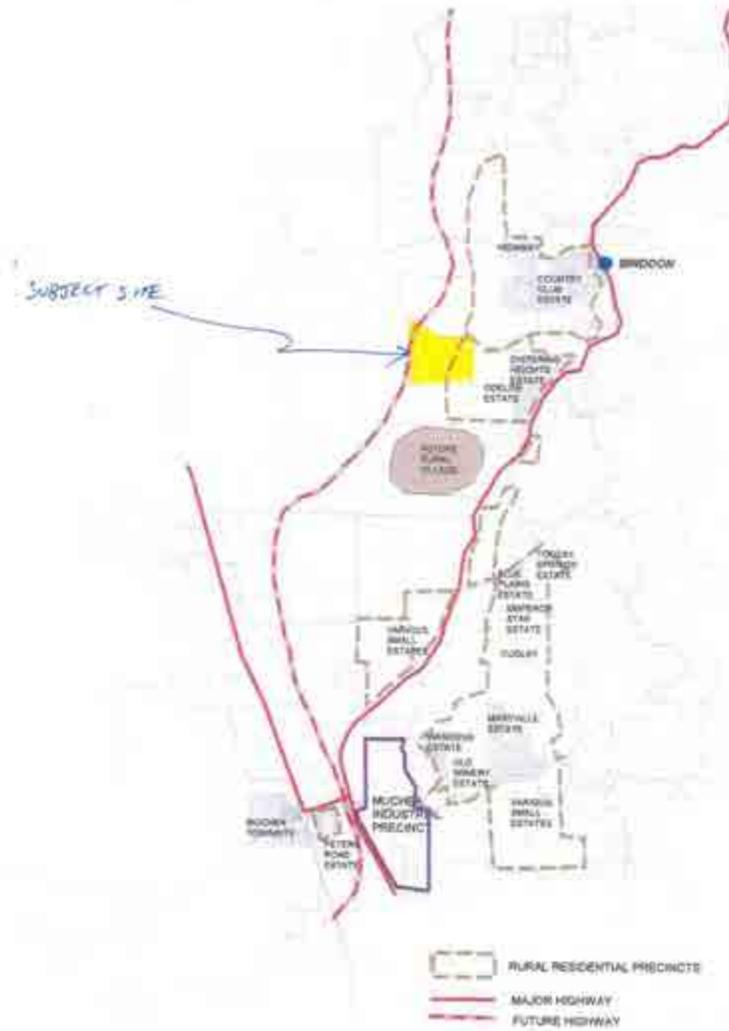


(Source: Shire of Chittering Local Planning Strategy, 2004 - modified)

FIGURE 4
LPS RURAL RETREAT PRECINCTS

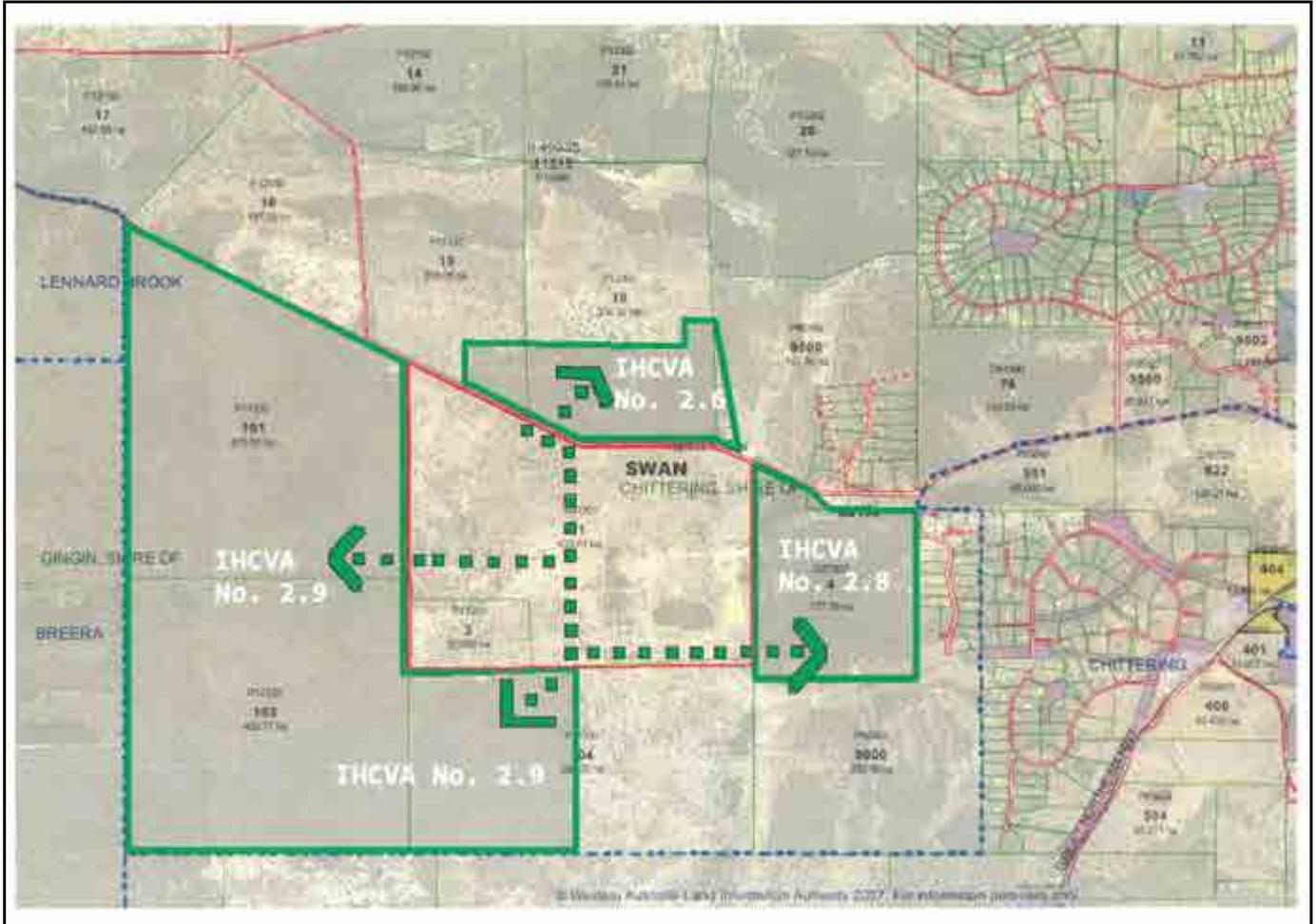
Shire of Chittering – Local Planning Strategy, 2001 - 2015

Figure 6 – Rural Residential Precincts



(Source: Shire of Chittering Local Planning Strategy, 2004 - modified)

FIGURE 6
LPS RURAL RESIDENTIAL PRECINCTS



(Source: Landgate - modified)

FIGURE 7
ECOLOGICAL LINKAGES



FIGURE 8
RURAL RETREAT SUBDIVISION CONCEPT PLAN

Land Capability Assessment (May, 2000)

LAND CAPABILITY ASSESSMENT

LOT 102 TEATREE ROAD

CHITTERING

Prepared by

LANDFORM RESEARCH
25 Heather Road
Roleystone

MAY 2000

CONTENTS

1.0	Introduction	1
2.0	Existing Environment	1
2.1	Geology and Geomorphology	1
2.2	Soils	2
2.3	Climate	3
2.4	Hydrology	4
2.5	Vegetation	4
3.0	LAND CAPABILITY	6
3.1	Water Availability	6
3.2	Soil Types	7
3.3	On Site Effluent Disposal - Nutrient Management	7
3.4	Basic Raw Materials	7
3.5	Stocking Rates	8
4.0	POTENTIAL LAND USES	9
4.1	Current Land Uses	9
4.2	Potential Land Uses	9
4.3	Agroforestry	10
4.4	Viticulture*	10
4.5	Other Crops	12
4.6	Freshwater Aquaculture	12
4.7	Floriculture	13
4.8	Fruit Trees/Perennial Horticulture	14
4.9	Alternative Stocking	14
5.0	GEOTECHNICAL CONSIDERATIONS	16
5.1	House and Road Construction - Foundation Stability	16
5.2	Drainage and Flood Risk	16
6.0	ENVIRONMENTAL MANAGEMENT	17
6.1	Aesthetics	17
6.2	Subdivision Layout and Buffers	17
6.3	Flora and Fauna	19
6.4	Water Quality - Lake Chittering	19
6.5	Heritage	20
6.6	Nutrient Management - Effluent Disposal	20
6.7	Drainage Salinity and Flood Risk	23
6.8	Mature Trees	23
6.9	Wind and Water Erosion	23
6.9	Fire Control	24
6.10	Social Impact	24
7.0	CONCLUSIONS	25

SUMMARY TABLES

Soil Characteristics
Land Qualities
Development Capability
Agriculture Capability

PLANS

Soil Map
Land Capability
Geotechnical Risk
Potential Land Uses

PHOTOGRAPHS

Aerial photography
General view across central north east of Lot 102
Regrowth of native vegetation in the south west
Soak on eastern boundary
Yellow sands that underly most of the site

1.0 INTRODUCTION

This study of Lot 102 Tee Tree Road, Chittering, was carried out to assess the current environmental status of the land, determine the land capability, and identify particular land uses suited to the site. The environmental management of the potential land uses was also considered. The assessment was based on a field analysis on 3 May 2000, 48 soil auger holes, geological and hydrological mapping, knowledge of the area, aerial photography interpretation and published information.

The site lies approximately 7.0 km south of Bindoon townsite, on the southern side of Tee Tree Road. The western boundary of Lot 102 will be slightly altered and moved eastwards when the planned Perth Darwin Highway is constructed. This will reduce the size of the lot by perhaps 40 hectares.

The current area of Lot 102 is 483.9 hectares.

2.0 EXISTING ENVIRONMENT

2.1 Geology and Geomorphology

The land varies from two main ridges at just over 210 metres in the south east corner and 205 in the central west dropping to 175 metres in a gentle valley in the south western corner and 163 metres on the central eastern boundary. Lot 102 straddles the divide between the east flowing streams and the west flowing streams.

The site lies at or just west of the Darling Fault, based on field geology on adjoining properties and gravity interpretation from the 1 : 250 000 Perth Geology Sheet, WA Geological Survey.

No rocks of the Chittering Metamorphic Belt occur on site, with the main rock type being remnants of a ferricrete cemented sandstone of alluvial origin that caps the ridges across the site. These may possibly have formed prior to the Eocene, and were slightly uplifted in the Late Eocene uplift which changed river patterns in the south west of Western Australia. This rock is resistant to erosion and this resistance has resulted in the formation of the ridges.

Deep yellow sands cover the remainder of the property. These sands are quartz sands of aeolian (wind deposition) origin or have been reworked by winds. They are earthy at depth and may have originally contained feldspar, which has now weathered to clay. Leaching of the sand to white sand, occurs in the valleys.

As the site appears to be west of the Darling Fault it is interpreted to be underlain by Cretaceous sediments on top of Mesozoic and Palaeozoic sediments of the Perth Basin.

2.2 Soils

The soils of the site reflect their position in the landscape and the underlying geology.

Resistant ferricrete with minor associated gravel is exposed on the higher elevations of the ridges with. Yellow sands cover the lower elevations and valleys, becoming thicker and more leached towards the stream valley floors.

The sand can be divided into three main types based on the colour, composition and fertility. Fertility is assessed as showing better pasture growth on aerial photography 1996 – 98.

Soil types are;

- Ferricrete and Gravel
- Leached Sand over Gravel
- Earthy Yellow Sand
- Yellow Sand
- Leached White Sand

Ferricrete and Gravel caps the ridges. The laterite duricrust restricts root penetration ensuring that the soil has very low capability. In general these soils have not been cleared.

Leached Sand over Ferricrete occurs on the upper slopes where grey sand over white or cream sand is generally 300 mm to 1000 mm thick over ferricrete. The soils are relatively infertile but the ferricrete influences soil fertility as shown by aerial photography by having better nutrient and water retention at depth. White sand deeper than 1000 mm, even if ferricrete does occur at depth, is of even lower fertility and is labelled Leached White Sand.

Hole 3	Central east
0 – 70 mm	Dark grey quartz sand
70 – 360 mm	Cream sand
360 – 880 mm	Pale yellow sand
880 mm	Ferricrete gravel
End of hole at 880 mm	

Earthy Yellow Sand occurs on the upper and mid slopes particularly in the central north. The sand has a thin grey surface horizon over dark yellow sand that is predominantly earthy, with small amounts of clay increasing with depth from a horizon that vanes from near the surface to over 1000 mm. These soils are shown by aerial photography of pasture quality to be the most fertile on site with good broad acre and perennial horticulture capability (provided sufficient water is available). The clay and goethite increase the water and nutrient retention of the profile, which is moderate.

Hole 12 South eastern corner	
0 – 100 mm	Grey quartz sand
100 – 1 560 mm	Yellow sand becoming darker with depth
1 560 – 1 970 mm	Dark yellow earthy sand
End of hole at 1 970 mm	

Yellow Sand occurs on the mid slopes where leaching has occurred. Its colour varies from cream to yellow in the upper horizons depending on the amount of goethite present. Clay has generally been removed from the upper metre of the soil profile. Leaching of the upper horizons reduces the fertility but the nutrient retention of the profile remains high for effluent disposal based on the depth of the soil.

Hole 47	Central north western corner
0 – 120 mm	Grey quartz sand
120 – 560 mm	Cream to pale yellow sand
560 - > 1 000 mm	Yellow quartz sand
End of hole 1 000 mm	

Leached White Sand is a leached white quartz sand formed from the removal of the yellow brown goethite covering from the quartz grains. These occupy the valley floors from the south west through to the eastern edge, and a patch in the north west. The leached sand contains in excess of 1 to 2 metres of white sand over yellow sand at depth. These soils have low to very low soil fertility and capability. In more recent times native vegetation on these soils has been allowed to regrow because of the low fertility in the west.

The areas of lowest elevation are wetter and thus are more capable for agricultural activity

Hole 26	Central south western corner
0 – 110 mm	Grey quartz sand
110 - > 1 300 mm	White quartz sand grading to cream quartz sand
End of hole 1 300 mm	

2.3 Climate

The climate of the area is typically Mediterranean with warm to hot dry summers followed by cool to mild wet winters. Data is recorded at Bindoon.

Summer maximum temperatures range from about 33 °C in the hottest months down to between 17 - 18 °C in winter. Minima range from 17 °C in summer down to 7 °C in winter. Rainfall at Bindoon averages about 795 mm.

Wind directions are predominantly from the east on summer mornings and south west in the afternoon depending on the arrival of the sea breeze. Winter winds are more variable.

2.4 Hydrology

Surface drainage is minimal due to the permeability of the soil, with only a small flow emanating from the soak/dam in the central east, draining to the east to ultimately enter Lake Chittering.

Groundwater drains from each catchment, defined by the ridge highs of the basement, with the volume being directly proportional to the size of the catchment and depth of sand. Therefore the greatest volumes of groundwater are in the central east valley and the south west. Water is available in the north but quantities will be reduced because the area of catchment is less.

Salinity levels are low, being 70 mSm in the soak on the eastern boundary, and 50 mSm in the bore in the centre of the site (potable water is <170 mSm). The current owner stated that the bore was at a depth of 30 metres.

There is no evidence of surface salinity and, considering the extent of clearing, and the depth to underlying sediments, it is unlikely that salinity will be expressed in the surface soils in the future.

2.5 Vegetation

The sandy soils are predominantly cleared apart from scattered trees which have mostly been retained. The gravel ridges have largely been left as remnant vegetation, but have been grazed to the extent that species are restricted in richness and density in most areas. The leached white sands in the west and south west have been allowed to regenerate and some indigenous species are now gaining a hold in these areas.

It was not possible to search for Rare and Declared species because of seasonal factors. *Acacia anomala*, a Declared Rare Plant, may possibly occur in the area but would be restricted to the ferricrete ridges which are recommended to remain as remnant vegetation.

Tagasaste has been planted in the central south on leached and yellow sands.

The main vegetation on the site are tree remnants of Eucalypt woodlands. The following partial community types are represented by scattered Eucalypts and taller shrubs;

Jarrah-Marri (*Eucalyptus marginata*, *E. calophylla*) Woodland occurs on the ferricrete/gravel and duricrust, grading into Jarrah Woodland where duricrust becomes significant and the soil more shallow. Marri Woodland was the dominant original vegetation on the yellow sand but changes to Pricklebark (*E. tottiana*) Woodland and remnant Banksia Woodland as the sand becomes more leached to the south west.

Juncus pallidus occurs on wet pasture areas with the introduced *Isolepis prolifera* associated with the wet area around the soak in the central east.

No evidence of dieback disease was noted.

Species noted during the site inspection are listed, with their most common habitat noted,

	Ferricrete Ridge remnants	Sand areas
<i>Allocasuarina humilis</i>		X
<i>Baeckea camphorsmae</i>	X	
<i>Banksia grandis</i>	X	
<i>Banksia menziesii</i>	X	
<i>Bossiaea eriocarpa</i>		X
<i>Calothamnus quadrifidus</i>	X	
<i>Conostephium pendulum</i>		X
<i>Conostephium pendulum</i>		X
<i>Daviesia incrassata</i>	X	X
<i>Daviesia triflora</i>		X
<i>Drosera pallida</i>	X	
<i>Dryandra lindleyana</i>	X	
<i>Dryandra sessilis</i>	X	
<i>Eremaea pauciflora</i>		X
<i>Eucalyptus calophylla</i>	X	
<i>Eucalyptus marginata</i>	X	
<i>Eucalyptus todtiana</i>		X
<i>Gastrolobium calycinum</i>	X	X
<i>Grevillea synaphea</i>	X	
<i>Haemodorum spicatum?</i>	X	
<i>Hakea lissocarpha</i>	X	
<i>Hibbertia cuneiformis</i>		X
<i>Hibbertia huegelii</i>	X	
<i>Hibbertia hypericoides</i>	X	X
<i>Hibbertia lasiopus</i>	X	
<i>Isolepis prolifera</i>		X
<i>Jacksonia floribunda</i>		X
<i>Juncus pallidus</i>		X
<i>Lepidosperma angustifolium</i>	X	X
<i>Lyginia barbata</i>		X
<i>Mesomelaena stygia</i>		X
<i>Mesomelaena tetragona</i>	X	
<i>Nuytsia floribunda</i>		X
<i>Patersonia juncea</i>		X
<i>Petrophile serruriae</i>		X
<i>Petrophile striata</i>	X	
<i>Petrophile linearis</i>		X
<i>Stirlingia latifolia</i>		X
<i>Styphelia tenuiflora</i>	X	
<i>Synaphea spinulosa?</i>		X
<i>Xanthorrhoea gracilis</i>		X
<i>Xanthorrhoea preissii</i>	X	

3.0 LAND CAPABILITY

The opportunities of the site are:

- Shallow ground water of high quality through the central and eastern parts of the site.
- Proximity to Bindoon.
- The presence of cottage and perennial horticulture in the Bindoon-Chittering area which could be extended to this site.
- The potential to further develop tourism in the Bindoon-Chittering area.
- Proximity to the proposed Perth to Darwin Highway.
- Remnant vegetation on the ridge areas.
- The presence of yellow sand over most of the site, which has good phosphorous retention in its profile.
- The form of the ridges which provide visual screening as well as increasing the aesthetics of the site.
- The presence of the wetland/soak in the central east.

The constraints on the site are:

- The poor quality of the ferricrete soils.
- A lack of supplementary water supplies over the ridge areas.
- Potential for wind erosion on the sandy soils.
- Shallow ground water that could be altered through in-appropriate land use.
- The presence of significant shallow groundwater flows that form the start of a water flow to Lake Chittering.
- The presence of significant areas of leached white sand that has very low agricultural capability and susceptibility to wind erosion.

3.1 Water Availability

The shallow sand filled valleys contain abundant shallow ground water, particularly in the central eastern parts. The groundwater drains from each catchment as defined by the ridges with the volume being directly proportional to the size of the catchment and depth of sand. Therefore the greatest volumes of groundwater are in the central east valley and the south west with lesser flows in the north and north west.

The nature of the site may however permit water to be available from depths of about 30 metres on the ridges which is slightly above the elevation of the shallow groundwater in the valleys.

Salinity levels are low, being 50 - 70 mSm which is potable (potable water is <170 mSm). Potability could be restricted in some areas by elevated iron levels.

Catchment on the site is difficult to estimate, but with a rainfall of 795 mm perhaps 15% of precipitation may reach the water table based on the depth to groundwater. If this was the case a recharge of 1 200 kL per hectare may be possible. Quantities will need to be proven in the field prior to any large scale development being undertaken. The soak in the east may have a catchment of 25 hectares which could result in available water of 30 000 kL/yea. This volume of water would be sufficient for 10 hectares of olives. A similar volume may be available in the south western corner.

With the location of the site on or just west of the Darling Fault, there is potential for deep groundwater. However contact with Water and Rivers Commission officers reveals that potential aquifers are not available and any supplies of deep groundwater are small and unlikely to be sufficient for agricultural land uses apart from stock supplies and minor perennial horticulture.

Lot 102 lies within the Gingin Groundwater Area and thus licences are required for both deep and superficial aquifers. Apart from maintenance of environmental flows, licences are likely to be available for extraction from the superficial aquifers.

3.2 Soil Types

Soil types range from moderate for many agricultural activities on the earthy yellow sands to low and very low on the leached white sands and areas of ferricrete outcrop. The better soils can be identified from aerial photography and field observation to be significantly better than the leached sand over gravel and the yellow sands.

Perennial horticulture such as olives is suitable for the earthy sands with wine or dried grapes in selected areas of earthy sands. These sands will however require irrigation and improvement through the addition of organic matter. The leached sand over ferricrete, whilst being better than leached white sands, has low capability for more intensive agriculture and is probably better planted to perennial pasture and stock feed shrubs such as *Tagasaste*.

The ferricrete gravels of the ridges have low capability for agriculture and should not be cleared.

See attached Land Capability maps.

3.3 On Site Effluent Disposal - Nutrient Management

The yellow sands and ferricrete soils have high phosphate adsorbing qualities based on the level of sesquioxides and clay at depth and the depth to water tables. Even the leached white sands on the ridges frequently overlies yellow sand, gravel and ferricrete at depths of a metre or so.

All yellow sand, loam, gravel and duricrust soils are capable of supporting conventional effluent disposal systems with the exception of the low elevation leached white sands which should be excluded from effluent disposal or will require alternative waste water disposal systems to ensure workable waste water disposal. 4.6 Nutrient Management-Effluent Disposal

3.4 Basic Raw Materials

There are supplies of sand on Lot 102. The earthy sand has potential as "bricks" sand and the leached sand potential for fill sand. Currently the market for these sands is low but in the future this will increase as the rate of development increases in the area.

Whether this sand should be retained for future use in the construction industry is debatable bearing in mind the long time frames for markets to increase. As the majority of land in the Bindoon area is broad acre land on which similar sand resources occur this site may not be

required. A larger lot in the south western corners could be set aside to protect sand resources if required. This area is currently being allowed to slowly revegetate to indigenous species.

3.5 Stocking Rates

The leached white sands have stocking rates of less than 1 DSE (one dry sheep equivalent per hectare if maintained on site all year round) if they are dry and not located on the lower elevations where summer moisture is available. Yellow sands have a slightly higher stocking rate of 3 to 5 depending on the soil, geomorphic position and availability of water for pasture management. A horse is rated as equivalent to 12 DSE.

The ferricrete ridges should not be stocked because of their poor pasture growth and difficulty with management.

The availability of water for summer irrigation pasture improvements and the use of perennial species can increase stocking rates significantly on all soil types.

Wind erosion of the site is currently moderate but could be extensive if adequate vegetation cover was not maintained. Care must be taken with the yellow sand leached sands which can easily blow when disturbed in summer.

4.0 POTENTIAL LAND USES

4.1 Current Land Uses

In the recent past the property has been used for grazing with occasional cereal and lupin crops. Currently the site is used for grazing.

4.2 Potential Land Uses

Some parts of Lot 102 are capable of more intensive land use provided groundwater is available as interpreted and observed around the soak in the east and the south western corner. There is a good opportunity to develop parts of Lot 102 as small scale perennial horticulture to complement other activities in the Bindoon-Chittering area such as tourism.

There is always a divergence of opinion on what is the best use for land such as this. The best soils are also the best soils for perennial horticulture and hobby rural blocks as they are least likely to degrade. On the other hand it is a more sustainable option to nominate areas where soils are known to be good as blocks suitable for perennial horticulture. This preserves the best soil and water resources for viable rural activities. Land of lower quality can then be used for hobby agriculture.

- Perennial crops are well suited to the region such as olives, essential oils, carob beans, nuts, floriculture, stone, citrus fruit and grapes on the better earthy yellow sands with water available.
- Aquaculture for yabbies, trout and marron in fresh water dams and tanks is unlikely to be viable because of the potential for nutrient loss and lack of suitable material for dam construction.
- Floriculture could be based on either indigenous flora such as Geraldton Wax, Banksias, Smoke Bushes, Eucalypts, Kangaroo Paws, Honey Myrtles, or exotics like Proteas on better soils.
- Some small areas are suited to cottage industries such as lavender, herbs and the like which require small areas and supplies of fresh water. These would compliment the local tourist craft and cottage industries.
- Perfume, essential oils and essences could be incorporated into cottage and craft industries to become a focus of tourism
- On the other hand intensive stocking is not appropriate because of the potential for soil erosion. However alternative stock such as emus and ostriches, may be sustainable because of the quality of the soils, provided adequate soil cover is maintained.

4.3 Agroforestry

Agroforestry is the intermingling production of agricultural produce with forestry produce. This could either take the form of alley type farming or the growth of small plantations developed as crop diversification, which may allow selected livestock to graze the understorey to reduce the weed and grass competition, while also preventing a fire hazard.

The trees can be selected to provide summer fodder, shelter belts, wind breaks, honey production, and wildlife habitats, depending on the trees used. This type of landuse could be the grazing of stock within the pine plantation following thinning to allow more light and the growth of pasture species.

Plantation Crops

Radiata Pines, Pinaster Pines, Tasmanian Blue Gums, Eucalyptus oil production may be possible. Other species may also be possible following research and the establishment of markets such as Blackwood *Acacia melanoxylon*, Spotted Gum *Eucalyptus maculata* and White Cypress *Callitris columellaris* and there may well be other suitable trees available as current and future research investigates and improves Australia's flora. The rainfall of 795 mm meets the criteria for these tree crops with perhaps Pinaster Pines being the most likely.

Plant Oil Production

There is great potential for the use of eucalyptus oil as a biodegradable industrial solvent. Recent advancements in bulk harvesting and processing, combined with development of high yielding clone varieties, allow oil mallee to be planted as double rows of trees one machine width apart. Planting density is typically 1100 to 1300 trees per hectare although this site is unlikely to have sufficient area for a viable industry.

The importation of essential oils increases annually and was near \$8 million in 1988/89. Oil production from genera such as *Leptospermum*, *Melaleuca*, *Kunzea*, *Eucalyptus* and *Baeckea* can provide a source of steam volatile oil that has uses in the perfume, flavouring, antiseptic and veterinary industries. Generally these species require large quantities of water and would only be sustainable on the lower slopes in the eastern portion of the site where irrigation is available. These generally need to be large mechanised operations extending over 10 or more hectares.

4.4 Viticulture

Viticulture encompasses both table grapes, wine and dried fruit production. The market is expanding for grape products for the local and export markets. Vineyards have already been established in the general area, but normally on the better loam soils. The earthy yellow sands have lower potential than the loam soils in other parts of the Bindoon area but have potential to provide a variation in both the type of grape and quality of the wine produced, which may be exploitable.

Table Grapes

Table grapes are grown with summer irrigation to increase the size of the berry. When correctly established table grape production from 1 - 2 hectares can be viable with crops producing up to 30 tones per hectare. Trellising and protection from birds is essential and increases establishment

costs to \$50 000 per hectare. The valley slopes on the earthy yellow soils are well suited to table grapes. Table grapes will need to be regularly irrigated but wine and currant grapes may not require daily watering. Trickle or micro-sprinkler fertigation systems are preferred.

Wine Grapes

Wine grapes require less summer water but need to be actively growing to allow good sugar production whilst at the same time maintaining the flavour and aroma compounds that are essential to good wines. Rainfall during the ripening period will cause sudden swelling and cracking of the grapes and encourage fungal attack as will high humidity. Frost is of low potential in this area.

North facing slopes are preferred as these maintain higher night temperatures in the soils. Wind is to be avoided and therefore the gently sloping valleys slopes are highly suitable particularly in the east.

Yields can be 5 - 15 t/ha depending on the level of irrigation with the lower yielding vineyards producing better wine because of increased flavour. A minimum area of about 4 - 8 ha of grapes is normally required for a small viable winery but there are markets for grapes produced by smaller operations which can be sold to existing wine makers in the Chittering/Bindoon area. Water requirements are lower than for table grapes and can be from 2 000 - 3 000 kL/hectare/year. In Wandering wine grapes are grown with only 600 kL per hectare because of the lack of water, but if available at least 1 200 kL per hectare is desirable. However a minimum of 3 000 kL per hectare should be planned for.

Typical vineyards in the Perth hills produce small quantities of wine, for example Avalon, Glen Forrest (100 cases annually from 2.5 hectares), Darlington Estate, Darlington (2000 cases annually), Piesse Brook, Bickley (1000 cases annually from 4 hectares). Olive Farm has 12 hectares with 11 varieties of grapes producing only 4 000 cases annually.

Smaller vineyards such as these normally pre-purchase grapes from quality vineyards. For example Aquila Estate is developed on similar yellow sand at Carabooda. It has only 4 hectares of vines but purchases grapes under long term contract from other areas such as Margaret River.

The current price for grapes varies from \$700 to \$1 500 per tonne, with say an average price of \$1 200 for high quality wine grapes at an average production of perhaps 6 t/ha. Greater tonnages per hectare do not normally command as high prices. For example at 15 tonnes per hectare a price of only \$700 per tonne may be paid. With increased plantings in recent years top quality grapes will always attract a premium but can only be produced where water is restricted or manipulated. Therefore grapes can generate about \$7 000 - 9 000 per hectare, making a viable income on relatively small vineyards of 8 hectares. In addition it is generally recognised in the industry that a family is capable of working 5 - 8 hectares of vines as a family operation with additional labour only required at picking time.

Recent research by CSIRO has shown that two fertigation lines alternatively used will enhance yield, reduce water consumption by half and produce better quality grapes.

Dried Grapes

There is increased interest in dried fruit, of high quality and extensive plantings have now been made in the eastern states. These must be planted to enable full mechanisation. Dried sultanas

and currents can attract \$1000 per tonne for high quality fruit with a production of 10 tonnes dried fruit per hectare. The plantings in the eastern states are in the order of 200 hectares but smaller mechanised plantings and co-operatives are possible.

4.5 Other Crops

Herbs

Herbs have a high potential to form the basis of cottage or commercial industries. The potential for herbs is growing because of increasing world wide use and the fact that Australia currently imports over 90% of its herb needs. Herbs are used for food flavourings, pharmaceuticals, essential oils and insecticides. Many herbs could potentially be grown but as some require different climatic conditions, research is needed into the selection of the most appropriate species for the area. These are normally grown on a larger scale using mechanised harvesting. For example profit margins of about \$1 200 per hectare would dictate a large operation unsuited to this site (Hyde 1998).

Essential Oils

There are many essential oils such as the tree crops (discussed under trees) and a wide variety of oils derived from herbs. Nearly \$3 million peppermint oil and nearly \$5 million of other oils were imported in 1988/89 although production has since commenced in the eastern states. These would fit very well into the current agricultural trends in Bindoon and could supply some of the local markets.

Examples include lemon, rose and peppermint oils from pelargoniums and lemon from lemon grass. Large mechanised operations are normally required for other than hobby incomes and these will be restrained by the slopes on this site.

Lavender

On the other hand Lavender has large potential markets for oil production or as heads of dried lavender. Dried lavender heads return \$18 to \$22 per kg. Stems of lavender sell for \$1.50 to \$2.00 per bunch wholesale with up to 10 bunches per bush and 3 000 - 5 000 bushes per hectare depending on the level of mechanisation. Selling stems and value added products could make a 2 hectare operation viable.

A variety of methods of extraction such as steam distillation, maceration and expression can be used to extract oils. Larger areas are required when oil is produced.

Soils are suited to production, and *Lavandula stoechas* is growing wild on the site.

4.6 Freshwater Aquaculture

Aquaculture for yabbies, trout and marron in fresh water dams and tanks is unlikely to be viable because of the potential for nutrient loss and lack of suitable material for dam construction.

4.7 Floriculture

Almost any native or exotic species suited to Mediterranean climates could be grown on the earthy yellow sands using water taken from the central drainage lines, and the plants watered by trickle irrigation. Water increases the quality and quantity of the blooms. Typical species could be Geraldton Wax, kangaroo paws, smoke bush, many of the Myrtaceae, Banksias, Verticordias (feather flowers) and other genera.

Floriculture can vary from native plants requiring low levels of water to exotics that require similar amounts to vegetables (up to 10,000 m³/ha). Depending on the species grown there should be sufficient water for a viable operation.

Dieback disease is a major concern for the industry as many species of wildflowers are susceptible.

Using suitable management techniques such as fertilising, pruning and removal of competitors, floriculture can return between \$1 000/ha to \$2 500/ha. The current market for flowers is the east coast of Australia and overseas, where markets are growing and new markets are being sought.

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Using suitable management techniques such as fertilising, pruning and removal of competitors, floriculture can return between \$1 000/ha to \$30 000/ha depending on the variety. The current market for flowers is the east coast of Australia and overseas, where markets are growing and new markets are being sought. Areas of 2 to 20 hectares can be viable depending on the species.

It is not uncommon for floriculture to be able to generate a viable or good hobby farm income on 2 hectares, for example Proteas, Lavender, Melaleuca and Eucalypts foliage, bulbs, Chrysanthemum, Roses, whereas some other species may require larger areas.

Some examples of areas required for a potentially viable income;

Lavender, roses, Chrysanthemum,	1 - 2 hectares
Banksias, bulbs	2 - 5 hectares
Boronia, Melaleuca and Eucalyptus foliage	2 - 3 hectares
Flannel Flowers	1 - 2 hectares
Geraldton Wax	1 - 2 hectares
Kangaroo Paws	2 - 3 hectares
Proteas	2 - 4 hectares

The most prospective areas are the yellow sands of the central north and east.

4.8 Fruit Trees/Perennial Horticulture

Perennial horticulture can include citrus, nut crops, olives, stone fruit, apples and the like. Again the area required to produce a viable income or hobby income will vary with the species grown, however for most perennial fruit such as apples and stone fruit a minimum of 5 - 10 hectares is required. Some speciality fruit such as Kiwi Fruit, passion fruit and others can generate a viable income from 2 - 3 hectares.

Stone Fruit, Citrus and some other perennial crops require much higher water usage of up to 10 000 kL per hectare which will restrict them to the eastern and possibly south western edges where earthy yellow sands occur near available water.

The earthy yellow sands, whilst capable of growing citrus trees, are not as good as the loam soils utilised in other parts of the Bindoon area..

Olives are suited to long, warm, dry summers with temperature ranges of 31 to 38 degrees C. A winter chill factor of 10 to 12 degrees mean temperature suggests that inland and southern areas are more suitable. Mature trees under irrigation produce 50 kg per year whilst non irrigated trees can be expected to produce half this amount. The Australian market is large and growing for both fruit and oil. In 1996/97 \$100 million olive oil and fruit were imported but significant plantings have been made Australia wide in the last year or two. Today the world market is satisfied so export potential could be restricted.

The most suitable soils for olives are the earthy sands. Irrigation of only 3 000 kL/hectare/year is required for table fruit but this can be reduced to increase the intensity of the flavours. Premium quality oil is probably where the best market potential lies but will need good marketing efforts and/or value adding to make any plantings viable. Depending on the variety and type of value adding 2 - 20 hectares of olives can produce a viable income. For example at Margaret River Stellar Ridge winery is trialing value added olive products that can produce a viable income from one hectare of olives.

Nut Crops

Nuts require conditions similar to those for fruit trees however most are popular with parrots and cockatoos and thus will require protection if they are to be grown successfully.

Almonds are more suited to the site and may not require summer water.

Pecans and **Walnuts** need deep, well drained soils and moisture throughout the year, particularly from spring to mid-summer. They could form part time incomes from small lots.

Other nut crops that have potential are as follows: **Pistachio, Quandong, Bunya Pine, Ginkgo, Jojoba, Manula** and **Tung**. (Suitability details should be obtained from the Department of Agriculture W.A.).

4.9 Alternative Stocking

Whilst, traditionally, areas such as this have been used for cattle there are several alternative animals that can be raised on small holdings because they command higher values and are easier

on soils. In general intensive stocking is not suitable for this site because of the steeper slopes and potential for nutrients to run off in surface flows.

Emus and Ostriches can be stocked at much higher stocking rates than hoofed animals because they are "easy" on the soil and are less likely to lead to soil degradation. Viable emu or ostrich businesses have been established on as small as 2 - 5 hectares. At this level they do not have the same environmental impact in terms of odour and soil degradation as other stock and do not need large buffers such as pigs. For example there are operations on Armadale Road, Forrestdale and at North Dandalup on small holdings adjacent to dwellings. Currently the price of these birds is depressed but with development is likely to turn around at some time in the future. There are some indications in the eastern states of increased interest in ostriches. However emus and ostriches on small rural holdings may have the potential to lead to nutrient loss from leached soils and thus suitable nutrient management techniques may need to be incorporated into any commercial venture depending on the location.

Alpacas and Llamas have soft hooves and are also suitable for stocking at higher than traditional rates. They command high prices and studs can be sustained on small lots down to 5 hectares or less. Currently these studs are aimed at the pet and stud markets, but the fleece commands high value and, as the cost of the animals reduces through increased numbers of animals, a balance will be reached where commercial production will occur.

An Alpaca stud currently operates on the Toodyay - Northam Road near Northam.

Small studs of **Goats** with premium fleece characteristics such as Angoras and Mohair are possible in addition to use as hobby activities. **Milking Sheep and Goat** operations, with the consequent production of small volumes of cheese, can be operated on small holdings, although supplies of fresh water for processing may prove limiting in some areas. At high stocking rates these have high potential to lead to soil degradation from wind erosion through hoof damage to pasture. The same situation exists for deer.

Small cattle such as Dexter and Lowline require less land and command higher prices as stud animals. These breeds are very well suited to small rural holdings because they are easy to manage and do not require the equipment and fencing needed for larger breeds. There is a growing market for small cattle on small rural holdings and the owners of these holdings normally have the funds to pay the higher prices required.

Miniature Horses have similar qualities and are just at the stage of developing a pet market for small rural holdings.

5.0 GEOTECHNICAL CONSIDERATIONS

5.1 House and Road Construction - Foundation Stability

Foundation stability for roads is high for all soils.

Foundation stability for dwellings is also high in all areas (AS 2870 Site Class A). The area around the soak in the central east is not suitable for dwellings or waste water disposal because of the leached sands and elevated water tables.

	GEOTECHNICAL FACTOR	MANAGEMENT
5.1.1	Foundation stability	<ul style="list-style-type: none"> Foundation stability is AS 2870 Class A

5.2 Drainage and Flood Risk

All areas apart from adjacent to the soak and the north eastern corner adjacent to the road are well drained.

There is no evidence of potential flooding.

	GEOTECHNICAL ISSUE	MANAGEMENT
5.2.1	Flood risk	<ul style="list-style-type: none"> There should be adequate setback of 100 metres from the soak in the central east.

6.0 ENVIRONMENTAL MANAGEMENT

The following items are identified as the most likely to impact on the environment. These items can be managed by the implementation of the management recommendations. Other items are unlikely to impact or the impact is regarded as small.

However the nature of the environmental management will depend on the nature of the subdivision proposed. Some areas of subdivision are proposed on the attached maps, but these are suggestions and will depend on planning issues. Thus the list of environmental management recommendations will act as a general guideline on how to achieve an environmentally sensitive development.

6.1 Aesthetics

The undulating nature of the site, and the low ridges, increase the aesthetic quality of the site as well as helping to reduce the impact of developments by providing sufficient screening. However the northern portion of the site is visible from Tee Tree Road and the Western portion will be visible from the planned Perth - Darwin Highway.

The colour and style of dwellings and other structures could be visually compatible with the area and to this end developments should be coloured, painted or colour bond sheeting used. The use of grey galvanised or zinc/alum sheeting should be avoided unless as an integral part of a development such as a roof on a "country style" home or shielded from key sight lines.

Alteration to existing view scapes from Tee Tree Road can be kept to manageable levels through the listed actions.

	ENVIRONMENTAL FACTOR	MANAGEMENT
6.1.1.	Remnant vegetation and trees	<ul style="list-style-type: none"> Development should include preservation of existing trees and vegetation by the sympathetic location of building envelopes. Trees should be preserved and protected from grazing pressure. Additional trees could be planted in strategic clumps to protect the viewscales. Development should be restricted by a 100 metre setback from the soak.
6.1.2	Setbacks	<ul style="list-style-type: none"> Developments should be set back 100 metres from Tee Tree Road.
6.1.3	Dwellings, fences and other developments are to be aesthetically compatible with the area.	<ul style="list-style-type: none"> Restrictions could be placed on the use of visually non compatible materials.

6.2 Subdivision Layout and Buffers

Lot sizes will depend on planning issues in addition to the land capability. Suggested lot sizes and potential land uses are shown on the attached maps.

It is preferred that smaller lots are clustered to assist servicing and buffer requirements. These should be located in areas which have lower soil capability but yet capable of pasture management through the use of groundwater. The best water sources could be utilised for

perennial horticulture and should thus be preserved on agricultural lots of 10 to 20 hectares to retain potential viable agricultural land.

A larger lot could be retained to protect sand resources in the south western corner but these resources are unlikely to be required for many years, and alternative resources occur on broad acre agricultural land to the west. In addition as this area of white sand is currently undergoing slow regeneration the best solution is likely to be to allow this process to continue. Therefore larger lots of 20 to 40 hectares are probably the best alternative. To preserve the sand a large lot could be retained as one broad acre lot.

One issue with lot sizes is the potential buffer between broad acre farmland and the creation of smaller lots. The land to the west, half of the south and east is uncleared remnant vegetation on soils of low land capability. It is unlikely that this vegetation will ever be cleared and will form a buffer.

The predominant winds are mainly from the east on summer mornings and south west in the afternoons. Winter winds are more variable.

A recent document relating to the potential conflict of horticulture and dwellings is the Draft Environmental Code of Practice for Vineyards, jointly prepared by Agriculture WA, Department of Environment Protection, Water and Rivers Commission, Grape Growers Association and the Wine Industry of WA.

The Draft Environmental Code of Practice recognises that buffers are related to aspects of the site conditions and land uses. Under spray drift, the Code of Practice quotes Spillman 1988 who stated that under research and subsequent modeling for aerial spray equipment (non-hooded) there was negligible drift 300 metres downwind. Based on that research a minimum distance was accepted as 300 metres where open ground applies but this can be reduced with the use of effective tree buffers and can be as low as 40 metres in the case of small vineyards. The Review of Agricultural Chemical Spray Drift, 1993, Coordinating Committee on Agricultural Chemicals, also recognised the potential for screening trees to reduce spray drift and the desirable use of "shelter belts" (p19).

As the only portion of land adjacent to broad acre farm land is in the south buffers are not necessary over the majority of Lot 102. In the south east the prevailing winds do not blow from the south and a setback of 100 metres for dwellings together with tree planting along this section of the boundary will provide protection.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.2.1	Subdivision design	<ul style="list-style-type: none"> • Buffers are not required round most of the boundary because it adjoins remnant vegetation which is unlikely to be cleared. • A setback of 100 metres from the boundary in the south east together with tree planting along the cleared boundary will provide separation between broad acre land and any development. • Setbacks of 100 metre from roads are recommended. • Building envelopes should be located 100 metres from the soak in the central east.

6.3 Flora and Fauna

The only remnant vegetation on the site is the scattered trees and the ridge tops. These should be retained and incorporated into any further plantings. Plantings and revegetation can form linkages as shown on the attached plans. Fauna will be advantaged by the planting of additional vegetation on newly created lots.

The natural regrowth on the leached sands in the west should be encouraged to regrow because these areas have very low soil capability and are highly susceptible to wind erosion. This is the current plan for these soils.

The wetland/soak should be protected.

	ENVIRONMENTAL FACTOR	MANAGEMENT
6.3.1	Remnant trees	• Trees should be protected from grazing pressure.
6.3.2	Remnant vegetation	• Roadside vegetation should be retained and local species used in any planting of the roadside.
6.3.3	Weeds	• As the site is cleared pasture weeds will not be an issue apart from the need for lot owners to control Declared weeds such as Skeleton Weed that has been recorded on the site in the past.
6.3.4	Fauna	• Fauna are likely to increase with development of small rural holdings.
6.3.5	Nearby remnant vegetation	• Cats are difficult to control and education is the most satisfactory method, through Shire of Chittering, local newsletters etc. • Dogs can be controlled through Council bylaws and public education.
6.3.6	Wetland/soak	• Development should be restricted by a 100 metre setback from the wetland/soak.

6.4 Water Quality - Lake Chittering

Lot 102 forms part of the catchment for the stream line running east to Lake Chittering, a System 6 nominated reserve. A soak on the central eastern boundary is the start of one tributary of this drainage line. The main issue is to prevent the level of nutrients or salinity from rising in this water flow and to ensure that sufficient water continues to flow from Lot 102 to maintain the stream and wetland functions.

Perennial horticulture associated with commercial operations and cottage industries will use potentially less water than annual horticulture and is better suited to the site, based on soil types, and will use significantly less nutrient usages.

Set backs from the soak should be 100 metres for developments and 50 metres for perennial horticulture. Water flows can be protected under the revised Rights in Water and Irrigation Act which will be implemented in the near future, where licences will be required to take water.

	ENVIRONMENTAL FACTOR	MANAGEMENT
6.4.1	Lake Chittering	<ul style="list-style-type: none"> Water flows can be maintained at adequate levels through encouragement of perennial agricultural activities, the restriction on intensive annual horticulture and the proposed changes to the Rights in Water and Irrigation Act. Larger lot sizes on the leached sands, potential nutrient calculations and soil assessments, suggest that potential nutrient losses from the proposed land uses will be minimal if at all. There is no evidence of salinity on site and the underlying geology and hydrology suggest that salinity will not increase with development.
6.4.2	Soak	<ul style="list-style-type: none"> Covered under Lake Chittering above. Development are recommended to be restricted by a 100 metre setback from the soak with a 50 metre buffer for perennial horticulture.

6.5 Heritage

Heritage issues concern the management of flora and mature trees.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.5.1	Archaeological sites	<ul style="list-style-type: none"> There are no sites known to the Department of Aboriginal Affairs.
6.5.2	Potential aboriginal sites	<ul style="list-style-type: none"> Aboriginal sites are protected under the Aboriginal Protection Act.

6.6 Nutrient Management - Effluent Disposal

Phosphorous is the main nutrient implicated in algal blooms in waterways. Nitrates can be bound to organic matter in the soil and lost through soil micro flora under anoxic conditions.

Nitrogenous substances are also taken up by vegetation or lost through volatilisation of ammonia. In leached sands with shallow groundwater, such as near the soak, the movement to the water table can be too fast for microbial activity to occur and thus setbacks are required.

The impact of nutrients is low in deep yellow sands for broad acre agricultural activities. In most areas, apart from the valley floors in the east and west, leached sands are underlain by yellow sand, or ferricrete, which increases the phosphorous retention capability. Phosphorous is adsorbed onto the yellow/brown goethite on the sand grains and in the ferricrete together with the 1 - 3% clay within the earthy sands. Phosphate retention capability must consider the whole soil profile which on the higher elevations is up to 30 metres to the water table, reducing down slope. Even five metres of sand with a low phosphate retention (PRI 5) is capable of retaining 60 kg of phosphorous per m².

The main issue with effluent disposal in subdivisions such as this is the design and placement of the systems to ensure that they work and provide adequate microbial purification rather than nutrient loss.

Yellow sands are recognised for their ability in managing nutrients in a number of published documents, for example SPP2 Peel-Harvey Estuary.

Appleyard S J 1993, *Explanatory Notes for the Groundwater Vulnerability to Contamination Maps of the Perth Basin*, Department of Minerals and Energy, 1993/6, shows the site as having Very Low Vulnerability to contaminate the deep aquifers of the Swan Coastal Plain.

Poinke established that the risk of phosphate loss from coloured sands such as those on the site are very effective at retaining phosphorous. Poinke et al, *Effect of Irrigated Horticultural Cropping on Groundwater Quality: Swan Coastal Plain, Western Australia*, CSIRO Water Resources Series No 2. Lantzke, 1997, *Phosphorous and nitrate loss from horticulture on the Swan Coastal Plain*, Agriculture WA

All soils are capable of supporting conventional effluent disposal systems with the exception of the small low lying areas adjacent to the soak, and will comply with the Government Sewerage Policy (metropolitan area).

There should be a 100 metre setback from the soak which complies with Water and Rivers Commission recommendations.

Nutrient Loadings

The leached white sands have stocking rates of less than 1 DSE (one dry sheep equivalent per hectare if maintained on site all year round) if they are dry and not located on the lower elevations where summer moisture is available. Yellow sands have a slightly higher stocking rate of 3 to 5 depending on the soil, geomorphic position and availability of water for pasture management.

The current input of nutrients will be predominantly from fertiliser applications and legume pasture.

Land Use	Kg/P/hectare/year	Kg/N/hectare/year
Carnations	80	1 920
Vegetables	80 - 340	400 - 900
Citrus	30 - 73	68 - 102
Olives	20 - 40	40 - 80
4 DSE/ha	6	40
1 horse	11	60
Domestic waste water of one household	5 - 6	18

Agriculture WA, 1990, *Horticulture and the environment*, Misc Pub 20/90.

Lantzke N, 1997, *Phosphorous and nitrate loss from horticulture on the Swan Coastal Plain*, Agriculture WA, Misc Pub 16/97.

Estimations of the impact of the nutrient loading can only be made based on denitrification, volatilisation of ammonia, recycling, uptake by vegetation and phosphate absorption by clays and sesqui-oxides.

The greatest input of phosphorous can come from the keeping of stock in confined areas such as a stable, or intensive annual horticulture. This may lead to soil degradation through wind erosion and dust generation and is not recommended.

Potential loss of nutrients from pasture and less intensive/perennial horticulture such as grapes, depends on the fertiliser application regime and the quality of the soils. This would not normally lead to nutrient losses, with the exception of applications applied to the lower lying leached sands.

A typical conventional septic system releases 5.5 kg P/year and 18 kg N/year. However allowing for six chickens, a dog and cat and a 250 m² area of fertilised horticulture, a further loading of 12.3 kg N/year and 5.2 kg P/year can be added for the dwelling area. (Data from Select Committee on Metropolitan Development and Groundwater Supplies, Legislative Assembly 1994 and Nitrate management in the Jandakot UWPCA, Dames and Moore, undated). One horse is estimated at 60 kg N/year and 11 Kg P/year.

Typical nutrient loadings that can be expected from the various soil types

Soil type	Possible lot size and activity	Nitrogen loading per hectare	Phosphorus loading per hectare	Likely nutrient scenario
Yellow sands	Current maximum stocking rate 5 DSE per hectare	50.30 kg N/ha/year	7.35 kg P/ha/year	Unlikely to be nutrient export
Leached sands with yellow sand or ferricrete at depth	2 ha conventional septic system 1 ha cottage garden	65.2 kg N/ha/year	20.4 kg P/ha/year	Unlikely to be nutrient export
Yellow sands	Estimated average potential stocking rate 4 - 5 DSE per hectare for a 3 hectare block and conventional septic system.	30.1 kg N/ha/year	7.2 kg P/ha/year	Unlikely to be nutrient export
Yellow sands	10 hectares olives, no stock and conventional septic system.	83.0 kg N/ha/year	41.1 kg P/ha/year	Unlikely to be nutrient export.
Yellow sands	20 hectares no stock and conventional septic system.	81.5 kg N/ha/year	40.6 kg P/ha/year	Unlikely to be nutrient export.

	ENVIRONMENTAL FACTOR	MANAGEMENT
6.6.1	Effluent disposal	<ul style="list-style-type: none"> All soil types are suitable for conventional septic systems with the exception of the area adjacent to the soak There should be no more than one effluent disposal unit per lot.
6.6.2	Land use and stocking	<ul style="list-style-type: none"> Intensive agricultural pursuits such as piggeries and feed lotting should not be permitted. Any stocking should be to Agriculture WA recommendations. Lots sizes suggested take into account the potential for nutrient loss and Agriculture WA stocking rates.

6.7 Drainage, Salinity and Flood Risk

All areas are well drained.

There is little potential for salinity increases in the soak on the eastern boundary.

	ENVIRONMENTAL FACTOR	MANAGEMENT
6.7.1	Potential flooding	<ul style="list-style-type: none"> • There is no risk of flooding.
6.7.2	Salinity	<ul style="list-style-type: none"> • No action required.

6.8 Mature Trees

Trees should be protected and developments located at sufficient distance to ensure dwellings are not subjected to risk associated with falling limbs or trees blown over.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.8.1.	Mature trees	<ul style="list-style-type: none"> • Developments should be located at sufficient distance to ensure dwellings are not subjected to risk associated with falling limbs or trees blown over.

6.9 Wind and Water Erosion

The potential for wind erosion is high on the sands, although yellow sands are capable of growing better pasture which must be maintained throughout the year. Wind erosion can also be reduced through the use of irrigation, wind breaks, planting perennial species such as tagasaste, and stock matched to the quality of pasture. Sometimes dust can be more of a problem than actual erosion when for example a horse is kept in a small paddock or stables.

In the west on the leached white sands indigenous vegetation is being allowed to regrow as a means of managing soil erosion. This is a successful method of land management, but does take the area out of production.

Potential water erosion is low apart from non wetting sloping sands.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.9.1	Soil erosion	<ul style="list-style-type: none"> • Adequate vegetation cover should be maintained on all soils throughout the year. • Stocking rates should be matched to pasture conditions.

6.10 Fire Control

Fire Control falls under the Bush Fires Control Act (as amended) and the Shire of Chittering.

Fire management will depend on lot sizes and permitted land uses. As the site is cleared with scattered trees, fire risk is reduced, although grass fires can produce high hazard given the right conditions. Fire risk is normally reduced through subdivision design, reduction in fuel by burning off or other means, the design and maintenance of strategic firebreaks, the availability of machinery and water to fight fires and the provision of emergency escapes.

The fire risk to property will increase following subdivision so it is important that the risk is minimised. Existing and new water sources will be able to be used for fire fighting and the roads will act as firebreaks together with the creation of new firebreaks as required.

	ENVIRONMENTAL FACTOR	MANAGEMENT
6.10.1	Fire Risk	<ul style="list-style-type: none"> Increased access, firebreaks and water points will assist fire reduction risk. The roads will act as fire breaks.

6.11 Social Impact

Social impact of the proposed sub division will be minimal but will be positive by bringing additional people to Bindoon/Chittering.

There is potential for this site to be developed for cottage industries, craft and other small scale tourism activities which will be valuable additions to the Bindoon/Chittering area.

	ENVIRONMENTAL FACTOR	MANAGEMENT
6.11.1	Social Impact	None required.

7.0 CONCLUSIONS

Lot 102 lies approximately 7.0 km south of Bindoon townsite, on the southern side of Tee Tree Road. The western boundary of Lot 102 will be slightly altered and moved eastwards when the planned Perth Darwin Highway is constructed. This will reduce the size of the lot by perhaps 40 hectares.

Lot 102, therefore, with its location adjacent to the proposed Perth Darwin Highway and proximity to Bindoon, is well placed for subdivision into a creative range of lots and landuses.

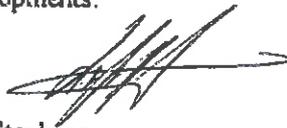
The subdivision of Lot 102 Tee Tree Road, Chittering has the potential to be a valuable addition to the local community and tourism industry. The soils and supplies of water provide high capability for some new and creative activities on smaller lot sizes provided the land management issues on the less capable soils are met.

Parts of Lot 102 are capable of sustaining small rural holdings ranging in size from 2.0 – 5.0 hectares in a cluster with the balance taken up by larger lots. The best agricultural land is in the east because of available water and could be protected in larger 10 and 20 hectares lots. On the other hand leached white sands are better left to allow regrowth of indigenous vegetation as is occurring.

Other lots are better suited to hobby, perennial horticulture or conservation lots because only domestic/stock supplies of groundwater are likely to be available.

The management actions listed under Environmental Management, Geotechnical Considerations, and the opportunities and constraints, are to provide guidance for subdivision design, and the development of conditions.

Any environmental issues identified can be managed through subdivision design and normal conditions that are placed on subdivision and developments.



Lindsay Stephens

Soil Characteristics	Ferricrete and Gravel	Leached Sand over Ferricrete	Earthy Yellow Sand	Yellow Sand	Leached White Sand
Location	On the higher elevations and ridges	Flanks or slopes adjacent to the ridges	Upper catchment	Upper catchment	Gentle valleys
Topsoil Texture	Yellow brown gravel and duricrust	Grey quartz sand	Grey quartz sand and yellow sand	Grey quartz sand and yellow sand	Grey quartz sand
Subsoil Texture	Yellow brown gravel and duricrust over loam-clays at depth	White sand over gravel and duricrust at depths of up to 1000 mm	Cream sand over yellow sand at shallow depth	Cream sand over yellow sand at shallow depth	Leached white sand over yellow/orange/brown sand at 1 meter or so.
Stone	Duricrust a major component of ridge tops	Nil	Nil	Nil	Nil
Gravel	Major component	Minor	Minor gravel	Minor gravel	Minor
Depth to Bedrock	Ferricrete over deep sediments	Ferricrete at < 1 metre over deep sediments duricrust may occur at 1 or 2 metres	Deep sediments	Deep sediments	Deep sediments
Hardpan	Ferricrete	Ferricrete at depth	Traffic hardpans possible	Traffic hardpans unlikely	Unlikely to develop
PH	Acidic to neutral	Acidic to neutral	Acidic to neutral	Acidic to neutral	Acidic to neutral
Salinity	Low	Low	Low	Low	Low
Soil Permeability	High	High	High	High	High
Soil Shrinkage	Very low	Very low	Very low	Very low	Very low

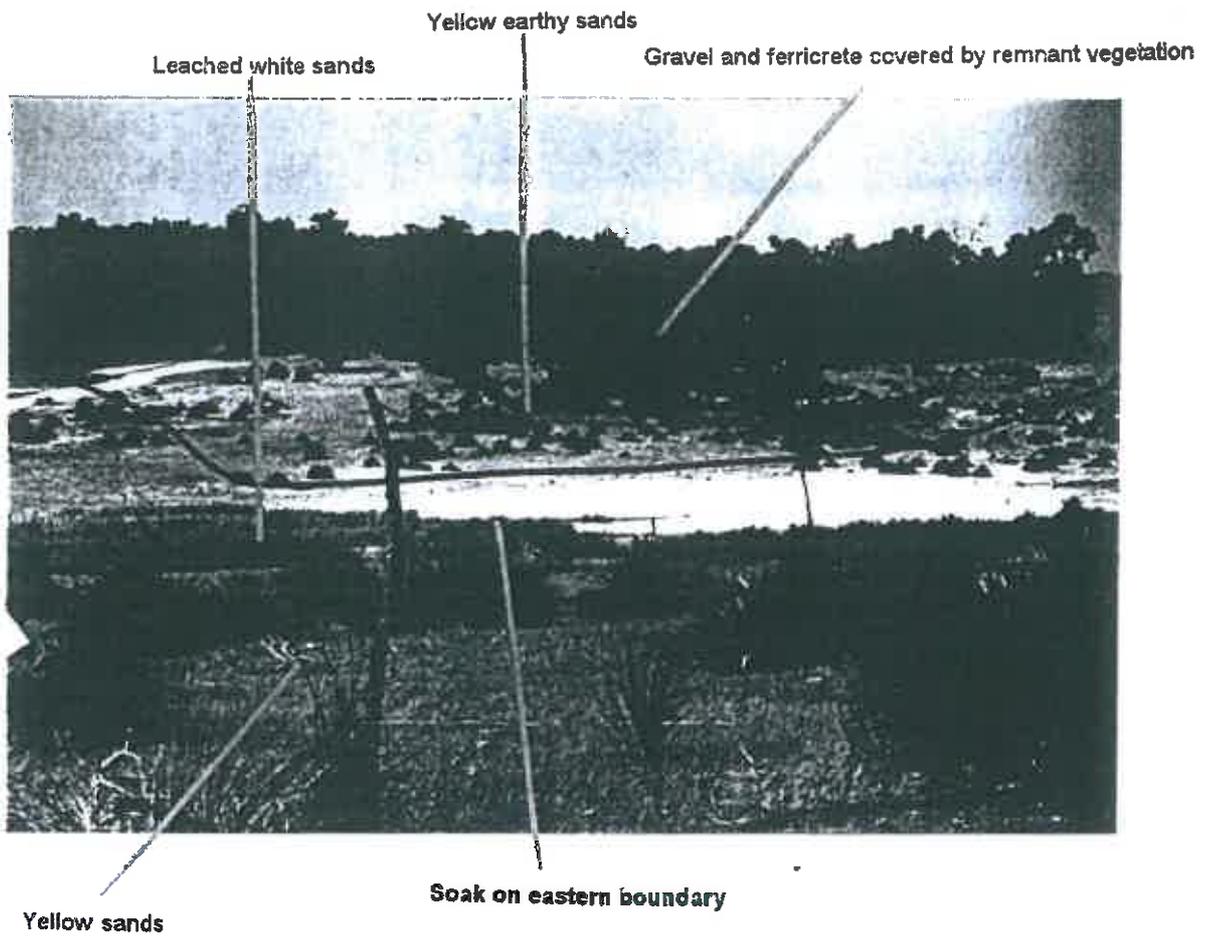
Land Qualities	Ferricrete and Gravel	Leached Sand over Ferricrete	Earthy Yellow Sand	Yellow Sand	Leached White-Sand
Slope	Gentle	Gentle to moderate	Gentle to moderate	Gentle	Gentle
Slope Stability	High	High	High	High	High
Wind Erosion Risk	Low	High	Moderate to high	Moderate to high	Moderate to high
Water Erosion Risk	Low	Low	Low	Low	Low
Drainage	Well drained	Well drained	Well drained	Well drained	Well drained
Moisture Availability	Very low	Very low	Moderate	Low - moderate	Very low
Water Logging	Nil	Nil	Nil	Nil	Adjacent to the soak
Wetability	Moderate	Non wetting at times	Non wetting at times	Non wetting at times	Non wetting at times
Flood Risk	Nil	Nil	Nil	Nil	Nil
Surface Water - Availability/Quality	Nil	Nil	Nil	Nil	Only at soak
Ground Water - Availability/Quality	Low potential	Low potential	Low potential	Low to moderate	Low to moderate
Salinity Risk	Low	Low	Low	Low	Low
Microbial Purification	Moderate to high based on soil depth	Moderate to high based on soil depth	Moderate to high based on soil depth	Moderate - high	Moderate to low
Water Pollution Risk	Low	Low	Low	Low	Low - moderate
Soil Profile; Phosphate absorption	High on the proportion of iron oxides and depth of soils	High based on ferricrete at depth	Moderate to high based on depth of yellow sand and presence of clay	Moderate based on depth of yellow sand	Low based on yellow sand at depth
Soil Profile; Nitrogen Removal	Low to moderate depending on the degree of anoxic conditions	Low to moderate depending on the degree of anoxic conditions	Moderate depending on the degree of anoxic conditions	Low to moderate depending on the degree of anoxic conditions	Low to moderate depending on the degree of anoxic conditions
Existing Degradation	Largely uncleared	Cleared	Cleared	Cleared	Cleared



General view across the central north east of Lot 102

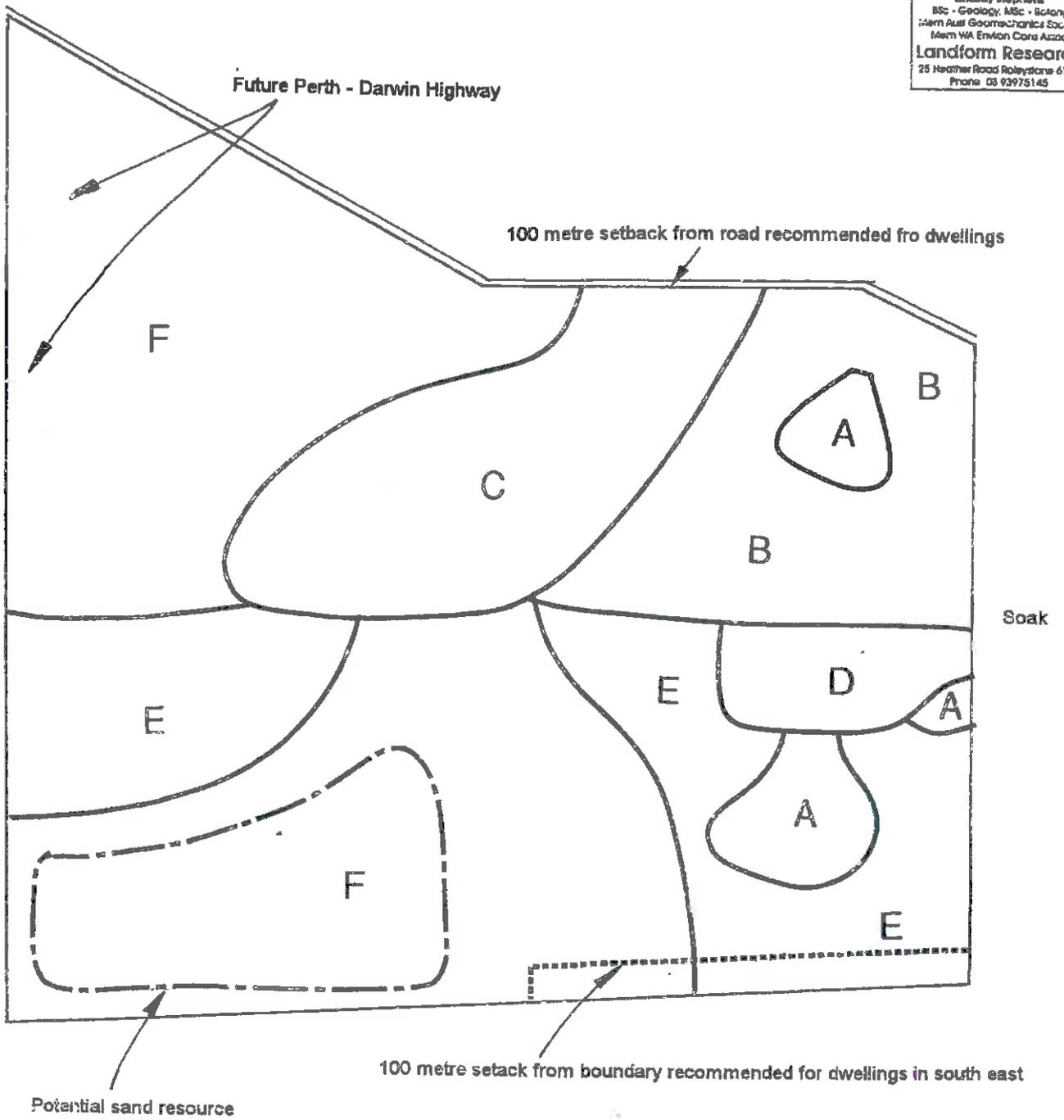


Regrowth of native vegetation in the south west



Yellow sands that underly most of the site

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POTENTIAL LAND USES

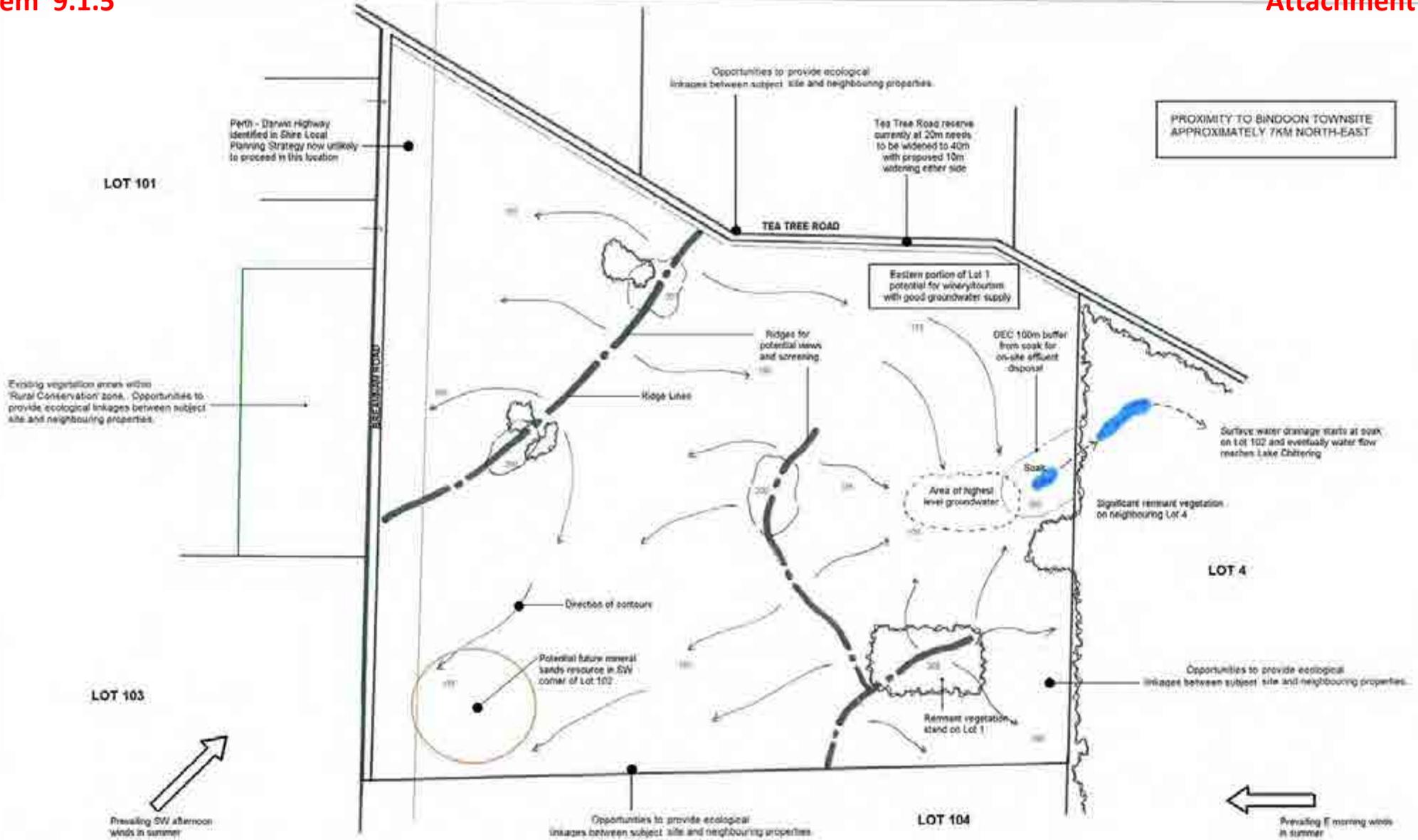
Lot 102 Tee Tree Road, Bindoon

	Possible Land Use	Soil Type	Possible Lot Sizes	Water Availability
A	Conservation	Ferricrete rock and gravel	< 5 ha	Very low
B	Rural Living	Yellow sand	2 - 5 ha	Water may be available and should be restricted to 1 500 kl. per lot
C	Perennial Horticulture/hobby	Earthy and yellow sands	10 ha	Stock water, insufficient for irrigation
D	Perennial horticulture	Earthy and yellow sands	10 - 20 ha	Water available for irrigation of crops. Perhaps >10 ha perennial horticulture possible
E	Hobby	Yellow sands and sand over ferricrete	5 - 10 ha	Water may be available and should be restricted to 1 500 kl. per lot
F	Large hobby and conservation lots	Leached sands and sand over ferricrete	10 - 20 ha	Stock water likely to be available



APPENDIX 2

Opportunities & Constraints Plan



Lot Number: 51763
 Sheet Number: 1/1000
 Date: 18 March 2015
 Drawn By: JPH

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**OPPORTUNITIES & CONSTRAINTS
 LOTS 1 & 2 TEA TREE ROAD
 BINDOON**

Whelans
 100 Commercial Road, East, From: 08 9442 0000
 PO Box 400, Bindoon, Western Australia 6450
 1300 642 111 or 08 9442 0000
 www.wheelans.com.au



APPENDIX 3

SPRING FLORA & VEGETATION SURVEY

**Lot 1 and 2 Tea
Tree Road,
Bindoon WA**

Spring Flora and Vegetation Survey



Kathryn Kinnear

Bio Diverse Solutions

15/3/2012



DOCUMENT CONTROL

TITLE

Lot 1 and 2 Tee Tree Road Bindoon Spring Flora and Vegetation Syrvey

Author (s) : Kathryn Kinnear

Reviewer (s) :

Job No. : WHEL014

Client : Marou Property Development Pty Ltd

REVISION RECORD

REVISION	SUMMARY	REVISED BY	DATE
DRAFT	CLIENT REVIEW	WHELANS	14/2/2012
FINAL	CLIENT		15/3/2012



Bio Diverse Solutions
55 Peppermint Drive
Albany WA 6330

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TABLE OF CONTENTS

1.	INTRODUCTION	4
	1.1.ALIGNMENT TO LEGISLATION, POLICY AND GUIDELINES	4
	1.2.SPRING FLORA AND VEGETATION SURVEY METHOD	4
	1.3.OTHER DOCUMENTS RELATING TO THIS PLAN	5
2.	SITE DETAILS	6
	2.1.DEVELOPMENT PROPOSAL	6
3.	DESKTOP ASSESSMENT – REGIONAL SETTING	7
	3.1.CURRENT SITE LAND USE	7
	3.2.CLIMATE	7
	3.2.1.RAINFALL	7
	3.2.2.TEMPERATURE	8
	3.2.3.WIND	9
	3.3.CLIMATE CHANGE	9
	3.4.TOPOGRAPHY AND SLOPE	9
	3.5.GEOLOGY AND SITE SOILS	9
	3.6.VEGETATION TYPES	9
	3.7.THREATENED FLORA SEARCH	10
4.	SITE ASSESSMENT	12
	4.1.METHODOLOGY	12
	4.2.VEGETATION	12
	4.3.MARRI JARRAH (EMCC)	13
	4.4.MOSAIC:	14
	4.5.PADDOCK GRASSLANDS (G)	15
	4.6.RECOMMENDATIONS	16
	4.7.THREATENED FLORA	16
	4.8.ENVIRONMENTALLY SENSITIVE AREAS AND THREATENED ECOLOGICAL COMMUNITIES	16
	4.9.WEEDS	16
5.	DISCUSSION	21
6.	CONCLUSION	22
7.	REFERENCES	21

APPENDICES

APPENDIX A – LOCATION MAPPING

APPENDIX B – OUTLINE DEVELOPMENT PLAN

APPENDIX C – DEC THREATENED FLORA SEARCH REPORT

APPENDIX D – VEGETATION MAPPING

APPENDIX E – FLORA SPECIES LIST

APPENDIX F – RECOMMENDATIONS MAPPING



1. Introduction

Bio Diverse Solutions was commissioned to undertake a Spring Flora and Vegetation Survey of Lot 1 and 2 Tee Tree Road Bindoon as part of investigations requested from Whelans in support of a proposal to rezone a portion of the land for Rural Residential purposes. The Spring Flora and Vegetation Survey is required by the Western Australian Planning Commission (WAPC) to assist with the rezoning process. The survey is aligned to Environmental Protection Authority (EPA) *Guidance Statement number 51: Terrestrial Flora and Vegetation Surveys*.

This report details the vegetation types on site, provides a flora inventory for the site, an assessment of Threatened Flora, and recommendations for management of the proposed land use.

1.1. Alignment to Legislation, Policy and Guidelines

In assessing the property, Bio Diverse Solutions has prepared this report aligned to the following legislation, please refer to Table 1 below.

Table 1–Government Legislation Applicable to the Proposal

Legislation	Responsible Government Agency	Aspect
<i>Agricultural and Related Resources Protection Act 1976</i>	Department of Agriculture, Western Australia	Weeds and feral pest animals
<i>Conservation and Land Management Act 1984</i>	Department of Environment and Conservation	Wetlands/Flora and fauna / habitat /weeds / pests / diseases
<i>Environmental Protection Act 1986 (Part IV)</i>	Office of the Environmental Protection Authority	Assessment and Management Environmental Impact
<i>Environmental Protection (Clearing of Native Vegetation) Regulations 2004</i>	Department of Environment and Conservation	Clearing of native vegetation
<i>Local Government Act 1995</i>	Shire of Chittering	Development approvals, Building approvals
<i>Soil and Land Conservation Act 1945</i>	Department of Agriculture and Food	Protection of soil resources
<i>Wildlife Conservation Act 1950</i>	Department of Environment and Conservation	Protection of indigenous wildlife
<i>The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).</i>	The Commonwealth Department of Sustainability, Environment, Water, Population and Communities	Protection of Vulnerable and Threatened species of national significance
<i>Country Areas Water Supply Act 1947 (WA) (CAWS Act).</i>	Department of Water, Water Corporation WA	Protection of water source areas and drinking water catchments.

1.2. Spring Flora and Vegetation Survey Method

This study was undertaken in October 2011 in spring conditions and has included desktop analysis and site survey of the site vegetation.

Desktop analysis included a number of resources reviewed, including:

- Database searches of the DEC Threatened Flora Database and review of Threatened Flora plant species for location, habitat and growth form;
- General texts including Native Vegetation WA (Shepherd *et al* 2002), A Biodiversity Audit of WA (Hearn *et al.*, 2002), and Local Biodiversity Strategy Shire of Chittering (SoC, 2010);
- Public available databases (Florabase, SLIP, WALIS, ASRIS etc);
- Review of species form, growth and habitat at the DEC State herbarium; and
- Overlay of GIS datasets (DEC Pre-European Vegetation extent and Department of Water (DoW) 250K Hydrogeology).

Site Survey included:

- The survey area was approximately 484 ha, with the majority of the site cleared. Remnant vegetation patches were traversed on foot and intensively sampled, a list of dominant flora species present (native and exotic) was compiled as seen; samples or photographs were collected for unfamiliar species;
- Threatened Flora searches as listed by DEC was undertaken in known locations and probable habitat types;
- Specimens collected were pressed, dried and identified;
- Specialist texts were used to identify specimens (Wheeler *et al*, 2002) with some checked against examples in the reference herbarium. The authority for taxonomic names was DEC's Florabase website as of November 2011;
- Assessment of vegetation types present and vegetation condition; and
- Herbarium verification for Threatened Species as required.

Vegetation condition was assessed to the following criteria:

- Pristine: Pristine or nearly so, no obvious signs of disturbance;
- Excellent: Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species;
- Very good: Vegetation structure altered, obvious signs of disturbance;
- Good: Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it;
- Degraded: Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management; and
- Completely Degraded: The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.

(Keighery, 1994)

1.3. Other documents relating to this plan

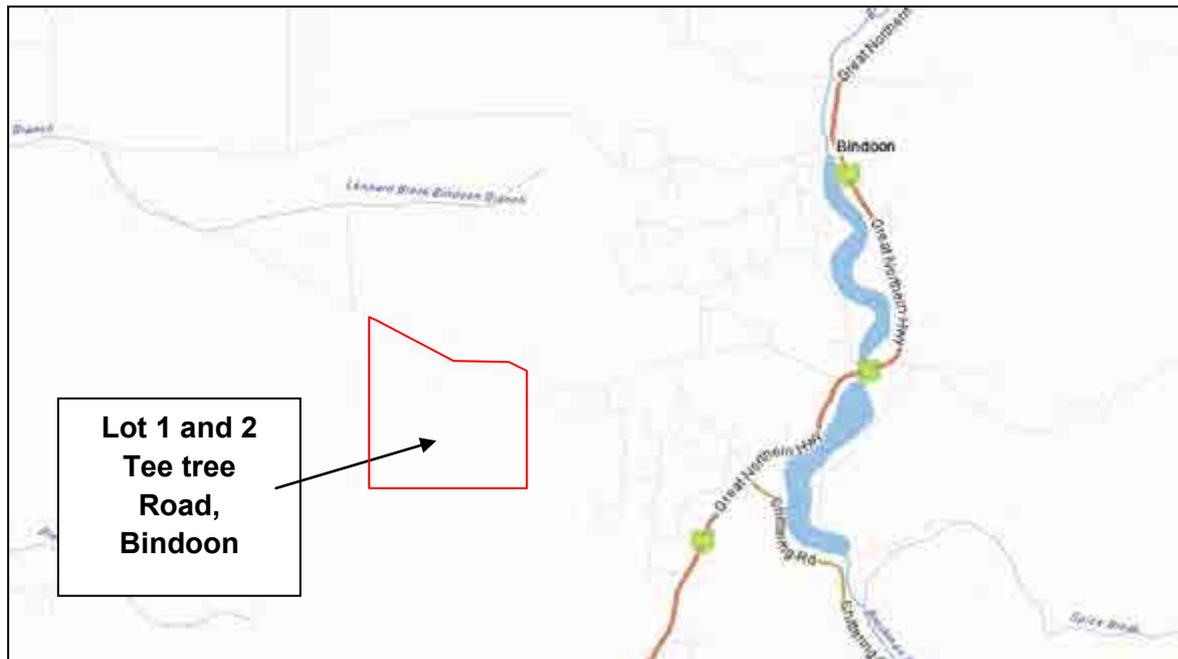
Other unpublished documents that have been prepared for this development proposal which should be consulted when reading this plan include:

- Outline Development Plan -Whelans (2012) ?
- Land Capability Report – Landform Research (2000)
- Fire Management Plan – Bio Diverse Solutions (2012)
- Stormwater Management Plan – Whelans/SMEC (2012)

2. Site details

The subject site is located south of Tee Tree Road and east of Brennan Road, approximately 10 km's south of Bindoon town site in the municipality of the Shire of Chittering. The subject site is a 48ha rural lot which has been used for grazing of stock. Please refer to Figure 1 below - Locality Map, and Site Location Mapping Appendix A.

Figure 1 – Subject site locality



2.1. Development proposal

The applicant is seeking to rezone the subject area for 'Rural Retreat'. The "Spring Flora and Vegetation Survey" has been undertaken prior the WAPC assessment for rezoning, to verify the floristic conditions on site and gives recommendations for any proposed development.

The development proposal includes the creation of 44 Rural Retreat Lots. In creating the subdivision the developer proposes to implement "Vegetative Corridors" to increase linkages to remnant vegetation from the north-south and east-west.

Please refer to the Outline Development Guide Plan as provided by Whelans, Appendix B.

3. Desktop Assessment – Regional Setting

3.1. Current site land use

The site is currently 2 rural lots of predominantly cleared paddocks with grasslands and small isolated patches of remnant vegetation, newly installed vineyards and tagasaste plantation. Historically the subject area has been used for sheep and cattle grazing. An abandoned shack exists in 1 (south west corner) and some shed buildings are located in Lot 2 associated with the rural activities. Please refer to Photograph 1 and 2 below.



Photograph 1 – View of abandoned shack in Lot 1 (south west of subject area)



Photograph 2 – View of shed infrastructure in Lot 2, associated with rural activities.

3.2. Climate

Bindoon has similar climate to Perth (75 Km away) and thus has been described as per Bureau of Meteorology descriptions of Perth. Perth experiences a Mediterranean climate, characterised by hot, dry summers and mild, wet winters. These seasons extend into the autumn and spring months, which are transitional periods between the main seasons.

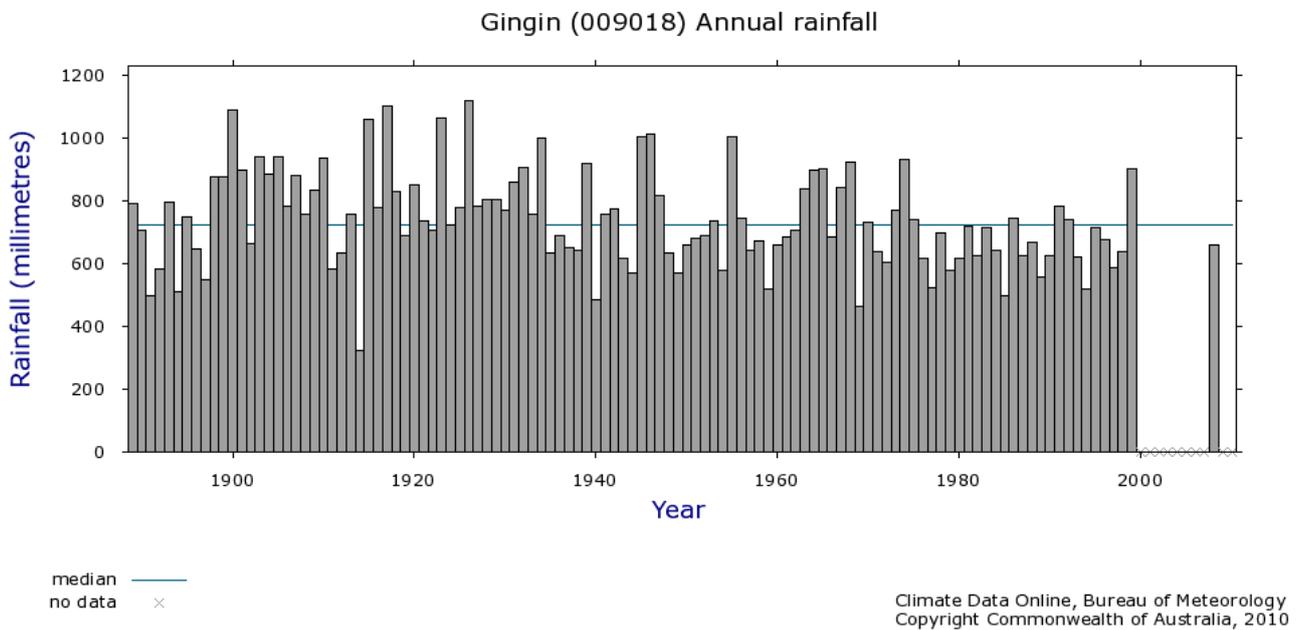
The climate of the region is strongly influenced by the position of the axis of the band of high pressure known as the sub-tropical ridge, and in the warmer months by the development in the easterlies to the north of the ridge of a trough of low pressure near the West Coast. For much of the year the ridge is located to the south allowing the east or southeasterly winds to prevail. During the cooler months the ridge periodically moves to the north allowing cold fronts to pass over the west coast and deliver much of the annual rainfall. Sometimes these fronts interact with tropical cloud bands from the northwest and this can enhance the amount of rainfall produced.

3.2.1. Rainfall

Of the annual mean rainfall of 869 mm, which occurs on 119 rain days, about 80% usually falls between May and September. Rain occurs on four days out of every seven on average during winter. Flooding is rare in Perth, however heavy rain may be produced by strong winter cold fronts or, less frequently, by summer storms or, more rarely, by decaying tropical cyclones. The highest daily rainfall is 120.6 mm recorded on 9 February 1992.

In contrast to winter rainfall, the mean summer rainfall is just 36 mm on an average of 10 rain days. It is not unusual for there to be extended dry periods during the warmer months. Please refer to Gingin Annual Rainfall graph over the page (Figure 2).

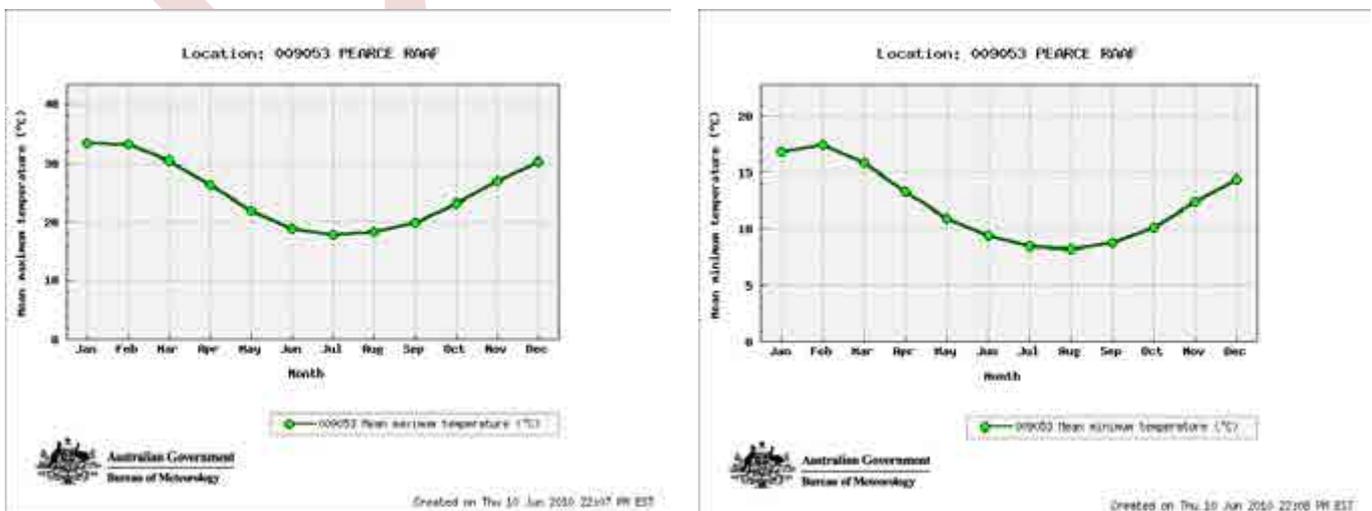
Figure 2 – BoM Rainfall for Gingin Station



3.2.2. Temperature

Mean monthly air temperature range from 31°C in February to 18°C in July and August. Summer maximum temperatures are strongly dependent upon the arrival time of the reliable sea breezes. On some days the difference between the maximum temperatures on the coast and the eastern suburbs may exceed 10°C. Heatwaves are associated with strong easterly winds and the late arrival or absence of the sea breeze. The highest temperature ever recorded is 46.2°C, however, the temperature exceeds 40°C on only three days per year on average. The average minimum temperature ranges from just 8°C in July and August to 17°C in January and February. Temperatures below 5°C are not uncommon during any of the winter months. The lowest temperature ever recorded at Perth Airport is -1.1. Please refer to average temperatures below for Gingin (40km away), Figure 3.

Figure 3 – Average Temperatures BoM



3.2.3. Wind

Winds are mainly easterly but varied in the warmer months by reliable afternoon sea breezes from the south west and in the cooler months by the westerlies that are associated with the bulk of the annual rainfall. Despite the occurrence of strong winds or gales, average wind speeds in winter are considerably lighter than in summer.

3.2.4. Climate Change

Climate change is expected to impact on the future rainfall pattern of the area. It is recognised that the average rainfall has already declined by 20%-30% over the past few decades and that the long term impact of climate change may lead to a shift in rainfall, as well as dryer climatic conditions for the region. The long term changes are predicted to impact on the flora, fauna and water availability for the region. (Climate Commission 2010)

The Climate Commission (Climate Commission 2010) estimates that *"...Rainfall patterns in Western Australia have changed over the last 40 years. There is significant evidence that climate change has contributed to the marked drying trend in the southwest of the state."*

The construction of the proposed development is not predicted to be affected by sea-level rise, however could be affected from increased intensity rainfall events or extended drying periods. The findings from the Land Capability Report (Landform Research 2000) recommends 100m setback from the soak in the central east area. This will ensure that any flooding or high rainfall periods do not affect infrastructure and that any watershed from the development from increased intensity rainfall events does not affect the Chittering River catchment area.

3.3. Topography and Slope

The subject site is located in an undulating landscape on the Dandaragan Plateau with the average slope for the site (assessed as an average over 4 slopes 100m in distance) calculated to be less than 5° and range between 1° and 3°. One metre contours indicate there are 2 hills in the western portion up to 201m AHD and one dominant ridge in the south east of the subject site up to 208m AHD. The lowest elevation of the site is in the east along the formation of a creek upper catchment at 168m AHD.

3.4. Geology and Site Soils

Australian Geoscience Mapping indicates the site is from the Pleistocene (Recent) Period (**Qpo**): ***colluviums, soil and undifferentiated sand cover over laterite of Coastal plain, includes minor alleviated areas*** (AGM, 1984). The subject site lies west of the Darling Scarp, within the Dandaragan trough of the Perth basin landform system.

3.5. Vegetation Types

The subject lies within the Swan IBRA bioregion. This bioregion is comprised of *"low lying coastal plain, mainly covered with woodlands. It is dominated by Banksia or Tuart on sandy soils."* The area is located within the *SWA1- Dandaragan Plateau The plateau is bordered by Derby and Dandaragan Faults. Cretaceous marine sediments are mantled by sands and laterites. Characterised by Banksia low woodland, Jarrah - Marri woodland, Marri woodland, and by scrub-heaths on laterite pavement and on gravelly sandplains.* (Hearn et al., 2002).

The vegetation has been mapped on a broad scale by Beard (Shepherd et al 2002) in the 1970's, where a system was devised for state-wide mapping and vegetation classification based on geographic, geological, soil, climate structure, life form and vegetation characteristics (Sandiford and Barrett 2010).

A GIS search of Beards vegetation classification for general area places the site within 2 broad Vegetation Associations for the site:

System Association: Gingin 1027

- Vegetation Association Number: 1027
- Vegetation Description: *Mosaic: Medium open woodland; jarrah & marri, with low woodland; banksia/Medium sparse woodland; jarrah & marri.*

(Source DEC Pre-European Vegetation GIS dataset)

3.6. Threatened Flora Search

A search of the DEC Threatened Flora Database within 5km of the subject area was undertaken a summary shown in Table 2 below and as provided by DEC in Appendix C.

Table 2 – Threatened Flora Database Search Summary

SPECIES	CONSERVATION CODE
<i>Acacia drummondii</i> subsp. <i>affinis</i>	3
<i>Acacia pulchella</i> var. <i>reflexa acuminata bracteole variant</i> (R.J. Cumming 882)	3
<i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>	3
<i>Astroloma</i> sp. <i>Cataby</i> (E.A. Griffin 1022)	4
<i>Chamelaucium</i> sp. <i>Gingin</i> (N.G. Marchant 6)	T
<i>Cyanicula ixioides</i> subsp. <i>candida</i>	2
<i>Gastrolobium nudum</i>	2
<i>Grevillea corrugata</i>	T
<i>Hypocalymma</i> sp. <i>Tea Tree Road</i> (O. Davies OD 171)	1
<i>Oxymyrrhine coronata</i>	4
<i>Ptychosema pusillum</i>	T
<i>Tetratea pilifera</i>	3
<i>Verticordia rutilastra</i>	3

Under the *Wildlife Conservation Act 1950*, the Minister for the Environment may declare species of flora to be protected if they are considered to be in danger of extinction, rare or otherwise in need of special protection. Schedules 1 and 2 deal with those that are threatened and that are presumed extinct, respectively.

Definitions of Threatened Flora under the *Wildlife Conservation Act 1950* are as follows:

- **T: Threatened Flora (Declared Rare Flora — Extant)**
Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such (Schedule 1 under the *Wildlife Conservation Act 1950*).
Threatened Flora (Schedule 1) are further ranked by the Department according to their level of threat using IUCN Red List criteria:
CR: Critically Endangered – considered to be facing an extremely high risk of extinction in the wild
EN: Endangered – considered to be facing a very high risk of extinction in the wild
VU: Vulnerable – considered to be facing a high risk of extinction in the wild.
- **X: Presumed Extinct Flora (Declared Rare Flora — Extinct)**
Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such (Schedule 2 under the *Wildlife Conservation Act 1950*).

Taxa that have not yet been adequately surveyed to be listed under Schedule 1 or 2 are added to the Priority Flora List under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna.

Taxa that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Conservation Dependent species are placed in Priority 5.

- **Priority 1** - Poorly known Taxa. Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. Priority 1 taxa may include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey;
- **Priority 2** - Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey;
- **Priority 3** - Poorly Known Taxa. Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey;
- **Priority 4** - Rare Taxa. Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years; and
- **Priority 5** - Taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxon becoming threatened within five years.

Based on the desktop assessment that has been conducted above, several Priority and Threatened Species could be present within the vicinity of Lot 1 and 2 Tee Tree Road Bindoon. A detailed site search was undertaken to assess the site for the above listed flora species (Table 2, Page 10).

4. Site Assessment

Site flora survey and intensive Threatened Flora survey was undertaken at the proposed development areas and remnant vegetation areas, this was undertaken on the 13th October 2011. This is the spring flowering period, and considered the appropriate time of year to capture most flowering species for positive identification.

4.1. Methodology

The survey area is defined as Lot 1 and 2 Tee Tree Road Bindoon, with the whole property mapped for vegetation types and intensive flora sampling for Threatened Flora in possible habitat types and remnant vegetation areas.

The remnant vegetation areas were traversed on foot and a list of dominant flora species present (native and exotic) was compiled as seen; samples or photographs were collected for unfamiliar species. Specimens collected were pressed, dried and identified. Specialist texts were used to identify specimens (Wheeler *et al*, 2002) with some checked against examples in the reference herbarium at the DEC Albany Regional Herbarium for confirmation. The authority for taxonomic names was DEC's Florabase website as of November 2011.

Intensive survey was undertaken for Threatened Flora species, with follow up identification at the DEC State Herbarium. Areas were searched for Threatened Flora adjacent to known populations and likely habitat for specific species. Vegetation condition was assessed during the field survey. Vegetation condition was assessed using the vegetation condition scale as per Keighery (1994).

4.2. Vegetation

Detailed vegetation inventory was undertaken in the vegetation types identified on site. A total of 149 species was identified within 3 vegetation types. The vegetation types are shown below in Table 3.

Table 3 – Vegetation Types Identified on site

Vegetation Unit	Beards Vegetation Association	Site Unit Description	Photograph
Medium woodland; jarrah-marri (EmCc)	965	Medium woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i>	

Table 3 cont.

Vegetation Unit	Beards Vegetation Association	Site Unit Description	Photograph
Mosaic Medium open woodland: jarrah, marri & banksias (EmCcBa),	1027	Medium open woodland: Jarrah & Marri, with low woodland Banksia/sparse woodland jarrah/marri	
Cleared paddock areas	N/A	Open paddocks, cleared of native vegetation, occasional paddock trees Jarrah & Marri,	

A map of the vegetation types identified on site is shown in Appendix D. Descriptions and Photographs of each vegetation type are given in the following sections.

4.3. Marri Jarrah (EmCc)

Shepard *et al.* (2002) estimate the pre-European extent of 965: Medium woodland; Jarrah – Marri was 114,948ha, with a current area of 5,415ha. It is estimated that 36% of this vegetation type is represented in national parks, nature reserves and state forest and 10.2% is represented in other reserves. The subject site comprised of approximately 20% of this vegetation type which was identified as small isolated remnant areas which had not been previously cleared in the eastern side of the subject area. Please refer to Appendix D– Vegetation Mapping.

The dominant overstorey species in this vegetation type are: *Eucalyptus marginata*, jarrah; and *Corymbia calophylla*, marri. These species form a mosaic of Medium to Low Open Forest with tree height between 15 to 30m. Jarrah comprises between 30-70% of the canopy cover and marri comprise 2-10% canopy cover. *Banksia grandis*, *Allocasuarina humilis*, occasional *Eucalyptus todtiana* (Coastal Blackbutt), *Banksia sessilis* var. *Sessilis*, *Xanthorrhoea preissii* and *Hakea lissocarpha* were the dominant second storey species within this vegetation complex, and represent 10-30% vegetation cover. These species were shrubs 1- 2m. The midstorey species were generally less dominant due to the vegetation being grazed. Please refer to Photographs 5 and 6.



Photograph 5 – View along eastern boundary of subject site in Jarrah/Marri vegetation type, Good Condition.



Photograph 6 – View of Jarrah/Marri in south east of subject site, the largest remnant patch, Good condition.

Other species identified within this cover class (1m to greater than 2m in height) include: *Anigozanthos humilis*; *Austrodanthonia occidentalis*, *Baeckea grandiflora*; *Caladenia flava* *Drosera erythrorhiza*; *Elythranthera brunonis*, *Haemodorum venosum*; *Kennedia prostrata*, *Lomandra caespitosa*, *Neurachne alopecuroidea*, *Petrophile striata*; *Stylidium hispidum*; *Stylidium calcaratum*; *Trachymene pilosa*, and *Tricoryne elatior*. The sedge and herb storey in this vegetation complex has 10-30% cover depending on the amount of grazing the vegetation has sustained. The majority of species were less than 1m in height. Please refer to Appendix D – Flora Species List.

The Medium Woodland vegetation type is generally considered to be in “Disturbed” condition: “*Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it;*” (Keighery, 1994). Some areas of “Good Condition”: “*Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it;*” (Keighery, 1994), occurs in the eastern extent of the remnant vegetation areas. Refer to Mapping Appendix D.

4.4. Mosaic: open woodland: Jarrah & Marri, with low woodland *Banksia*/sparse woodland jarrah/marri (EmCcBa)

Shepard *et al.* (2002) estimate the pre-European extent of Vegetation Type 1027 open woodland: Jarrah & Marri, with low woodland *Banksia*/sparse woodland jarrah/marri was 46,748ha, with a current area of 16,423ha. It is estimated that 30.1% of this vegetation type is represented in national parks, nature reserves and state forest, and 0% is represented in other reserves. Lot 1 (south west of subject area) is comprised of approximately 90% of this vegetation type, although is in a much degraded form due to clearing and grazing of stock. Please refer to Appendix D – Vegetation Mapping.

The overstorey in this vegetation type is dominated by a mosaic of *Eucalyptus marginata*, jarrah; *Corymbia calophylla*, marri, and *Banksia attenuata*; Slender *Banksia* and occasional *Eucalyptus tottiana*, Coastal Blackbutt and *Nuytsia floribunda*; Australian Christmas Tree, comprising to 10-60% cover depending on disturbance. The dominant shrubland species in this vegetation type are: *Pteridium esculatum*, braken, *Adenanthos cygnorum*, *Astroloma xerophyllum*, *Bossiaea eriocarpa*, *Centrolepis drummondiana*, *Daviesia nudiflora*, *Hakea ruscifolia*, *Hibbertia hypericoides*,

Lechenaultia floribunda *Jacksonia floribunda*, *Patersonia occidentalis*, and *Synaphea spinulosa* which comprise 0-30% cover depending on disturbance. Please refer to Photograph 7 below.



Photograph 7 – View of Mosaic: jarrah, marri, banksias woodland in sandy soils in south west of subject area.

This vegetation type which has been disturbed is generally considered to be in “Degraded” condition: “*Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management*”. (Keighery, 1994).

4.5. Paddock Grasslands (G)

The cleared areas form approximately 70% of the property. This vegetation type is considered to be in a “Completely Degraded” condition: “*The structure of the vegetation is no longer intact and the area is completely or almost completely without native species*” (Keighery, 1994). This area can be described as Parkland Cleared, and may have been cleared in the past for the purposes of farming and agricultural use. Vegetation is primarily composed of environmental (non aggressive) weed species with isolated trees of *E.marginata* and *C.calophylla* and some areas of tagsaste plantations.

Please refer to Photograph 8 and 9 below, and Vegetation Mapping Appendix D.



Photograph 8 – View to the west from eastern paddocks



Photograph 6 – View of isolated Jarrah/Marri trees in cleared paddock areas.

4.6. Recommendations

Based on the site survey, it is therefore recommended:

- The development is restricted to areas previously disturbed.
- Intact native vegetation in “Good” Condition should be retained to preserve biodiversity and habitat;
- Clearing of any native vegetation should be restricted to existing cleared areas and should not extend into current remnant vegetation patches; and
- Vegetation should be fenced from stock.

4.7. Threatened Flora

A search of the DEC Threatened (Declared Rare) Flora and WA Herbarium Databases was undertaken with the Species and Communities Branch of DEC. Please refer to Report in Appendix C. The database search revealed a possible 13 species could be located within 5km of the subject area.

The subject site was intensively searched in remnant vegetation areas for Threatened Flora species, as listed in Table 2 and Appendix C. Searches were undertaken in walked, sweeping transects searching all of the remnant vegetation areas for a minimum of 100m outside of vegetation areas.

Site searches revealed the presence of Priority Flora species (*Acacia drummondii ssp affinis*), Priority 3 pursuant to Subsection 2 of Section 23F of the *Wildlife Conservation Act 1950*. Please refer to Vegetation Mapping Appendix D.

No species of Declared Rare Flora (DRF) was located on site.

It is therefore recommended:

- The development is restricted to areas previously cleared, and the remnant vegetation area containing the Priority 3 species *Acacia drummondii ssp affinis* is fenced to exclude stock to maintain habitat for the species.

4.8. Environmentally Sensitive Areas and Threatened Ecological Communities

There are no Environmentally Sensitive Areas on the subject site or adjacent to Lot 1 and 2 Tee Tree Road, Bindoon.

A search for Threatened Ecological Communities (TECs) within the Swan (SWA2) IBRA bioregion on the SLIP portal database found that there are no TECs present on the subject site.

4.9. Weeds

In 1976 the Agriculture Protection Board introduced legislation to control weeds – the *Agriculture and Related Resources Protection Act 1976*. This legislation sets out “declared” plants and legal obligations to landowners in regards to these species. If a plant is declared then landowners are obliged to control that plant on their properties.

Environmental Weeds are defined by the “Environmental Weeds Strategy for Western Australia” (1999) as “plants that establish themselves in natural ecosystems and proceed to modify natural processes, usually adversely, resulting in the decline of the communities they invade”. At present there is no legislation governing management of Environmental Weeds, landowners are encouraged to control movement and restrict further spread of these species.

Any plant other than a declared plant can be prescribed as a “Pest Plant”, under Section 109 of the *Agriculture and Related Resources Protection Act 1976*. Typically these are prescribed whereby the occurrence of these may adversely affect property values, comfort or convenience of the inhabitants of a particular district.

The Act states (6) (1) “The council may serve on the owner or occupier of private land...a duly completed notice...requiring him/her to destroy eradicate, or otherwise control any pest plant on that land”(Agriculture and Related Resources Protection Act 1976).

Thirty eight weed species in total were recorded, excepting the Pink Gladiolus (*Gladiolus caryophyllaceus*), the majority of these weeds are non aggressive in nature, refer to Table 3.

Table 3 – Weed species present on site

Family	Species	Common Name
POACEAE	<i>Avena sp.</i>	Wild oats
BRASSICACEAE	<i>Brassica tournefortii</i>	
POACEAE	<i>Bromus diandrus</i>	
MYRTACEAE	<i>Callistemon x citrinus</i>	
FABACEAE	<i>Chamaecytisus palmensis</i>	Tagasaste
ASTERACEAE	<i>Cotula coronopifolia</i>	Waterbuttons
CYPERACEAE	<i>Cyperus brevifolius</i>	
CYPERACEAE	<i>Cyperus tenuiflorus</i>	
ORCHIDACEAE	<i>Disa bracteata</i>	
SCROPHULARIACEAE	<i>Dischisma arenarium</i>	
POACEAE	<i>Ehrharta longiflora</i>	Annual Veldt Grass
GERANIACEAE	<i>Erodium botrys</i>	
IRIDACEAE	<i>Gladiolus caryophyllaceus</i>	Pink gladiolus
ASTERACEAE	<i>Helichrysum luteoalbum</i>	
ASTERACEAE	<i>Hypochaeris glabra</i>	
CYPERACEAE	<i>Isolepis marginata</i>	
CYPERACEAE	<i>Isolepis prolifera</i>	
FABACEAE	<i>Lotus subbiflorus</i>	
FABACEAE	<i>Ornithopus compressus</i>	
FABACEAE	<i>Ornithopus sativus</i>	
OROBANCHACEAE	<i>Orobanche minor</i>	
SCROPHULARIACEAE	<i>Parentucellia viscosa</i>	
POACEAE	<i>Pentaschistis airoides</i>	
POLYGONACEAE	<i>Persicaria decipiens</i>	
CARYOPHYLLACEAE	<i>Petrorhagia dubius</i>	
POACEAE	<i>Polypogon monspeliensis</i>	Annual beardgrass
IRIDACEAE	<i>Romulea rosea</i>	Guildford grass
ASTERACEAE	<i>Sonchus asper</i>	
ASTERACEAE	<i>Sonchus oleraceus</i>	Sowthistle
FABACEAE	<i>Trifolium arvense</i>	Hare's foot clover
FABACEAE	<i>Trifolium dubium</i>	
FABACEAE	<i>Trifolium hirtum</i>	Rose clover
FABACEAE	<i>Trifolium subterraneum</i>	Subclover
ASTERACEAE	<i>Ursinia anthemoides</i>	
ASTERACEAE	<i>Vellereophyton dealbatum</i>	
POACEAE	<i>Vulpia myuros</i>	
CAMPANULACEAE	<i>Wahlenbergia capensis</i>	

The weed species identified are not “Declared” weeds under the *Agricultural and Related Resources Protection Act 1976*, and are environmental weeds which should be restricted from movement off-site and further into any adjacent vegetation. The Pink Gladiolus (*Gladiolus*

caryophyllaceus) is aggressive and is present within the remnant native vegetation on the eastern boundary of the subject site. It is recommended this species is targeted for control and eradication from the area to allow native species to establish.

Skeleton Weed (*Chondrilla juncea*) has been recorded on site, however no species were located during vegetation survey. Skeleton Weed is a Declared plant. Management strategies for this species include:

- P1 – Plants which cannot be introduced or spread; and
- P4 – Containment, plants should be prevented from further spread.

Skeleton Weed Control Method - Report any plants to the Department of Agriculture and Food (DAFWA)

All plants found must be reported immediately to Agriculture Western Australia or District Agriculture Protection officers to be dealt with under the Skeleton Weed Eradication Project.

It is therefore recommended:

- Weeds should be controlled on-site and restricted from movement offsite, this can be undertaken by ensuring machines are clean on entry and exit when disturbing any soils or vegetative matter;
- The Pink Gladiolus (*Gladiolus caryophyllaceus*) is targeted for eradication in the eastern remnant vegetation area; and
- Continue monitoring the subject area for occurrences of the Declared plant Skeleton Weed (*Chondrilla juncea*) and if located report to DAFWA.

5. Discussion

The Shire of Chittering have a Local Biodiversity Strategy which aims to conserve existing native vegetation and extend linkages to further protect vegetation complexes and values. The subject site is not located in a Priority area or contains a Priority Vegetation Complex.

The Priority areas of native vegetation (SOC, 2010) include:

- Natural areas with vegetation complexes under represented regionally and locally, within and outside the IHCVAs;
- Adequate buffers to significant flora, fauna and ecological communities;
- Adequate buffers to creeklines and other wetlands;
- Vegetation that provides habitat to Carnaby's black cockatoos;
- Patches of native vegetation that form a regional or local ecological linkage;
- Buffers to formal conservation reserves as well as private properties with voluntary management agreements through Land for Wildlife and conservation reserves or similar; and
- High conservation value roadside remnant vegetation.

The vegetation on site supports possible habitat and feed trees for the Carnaby's Black Cockatoo and Baudin's Cockatoo these species are presently protected Federally and under State legislation.

Status:

Carnaby's Black Cockatoo: Wildlife Conservation (Specially Protected Fauna) Notice 2010 - Schedule 1 Endangered: EPBC Act Endangered; Forest Red-Tailed Black Cockatoo: Wildlife Conservation (Specially Protected Fauna) Notice 2010 Schedule 1 - Vulnerable: EPBC Act Vulnerable;.

A survey of possible habitat trees and feed trees was not undertaken within the scope of these works. It is possible that isolated trees in paddock areas could be frequented by these species. A survey of trees which are going to be removed in the paddock areas (i.e for road or fencing infrastructure) should be undertaken and referral to the Federal Department of Sustainability, Environment, Water, Population and Communities may be required depending on the outcome.

The subject site supports remnant native vegetation patches in the east of the site which is in "Good" Condition which, if fenced from stock, would recover to "Excellent Condition without any further revegetation. The protection of these areas would provide an increase in the biodiversity values of the local area, meeting one of the aims of the Shire of Chittering Biodiversity Strategy.

It is recommended to the client that the following is implemented at Subdivision to ensure the existing Biodiversity values are achieved and future values for the area are achieved:

1. Protect the Priority 3 species *Acacia drummondii ssp affinis*, and provide further suitable habitat for the species in the future by fencing the area from stock;
2. Increase the local Biodiversity by creating north-south and east-west micro corridors.
3. The remnant vegetation areas in the east should be fenced to exclude stock in an effort to increase the biodiversity within these areas and encourage regeneration.
4. A survey of current habitat and feed trees of the Carnaby's and Red tailed black cockatoo occur of any trees >500mm diameter.
5. Applying Development Exclusion Zones over remnant vegetation areas in 'Good Condition' to ensure the long term protection of these areas. A notification on title should be applied to ensure if the land is sold this is known to prospective buyers.

These recommendations have been mapped across the site and is shown in Appendix F – Recommendations Mapping.

6. Conclusion

Bio Diverse Solutions was commissioned to undertake a Spring Flora and Vegetation Survey of Lot 1 and 2 Tee Tree Road Bindoon as part of investigations requested from Whelans in support of a proposal to rezone land for Rural Residential purposes. The Spring Flora and Vegetation Survey is required by the Western Australian Planning Commission (WAPC) to assist with the rezoning process. The survey is aligned to Environmental Protection Authority (EPA) *Guidance Statement number 51: Terrestrial Flora and Vegetation Surveys*.

This report details the vegetation types on site, gives a flora inventory, an assessment of Threatened Flora and recommendations for future management of the proposed Rural Residential Development land use. The assessment of the site involved desktop assessment by review of the GIS datasets mapping (DoW, DEC), review of DEC Threatened Flora Database, review of literature sources, searches of Florabase and associated reference texts.

The survey area was approximately 484 ha, with the majority of the site cleared for agricultural use, intensive survey was undertaken in remnant vegetation patches via traversing on foot. Physical survey was undertaken in the spring flowering period on the 13th October 2011, which is considered the appropriate time of year for positively identifying plant species. Site survey included sweeping transects across the whole site, remnant vegetation areas, and further intensive searches for Threatened Flora at probable habitat types.

A total of three Vegetation types were identified on site, being:

- Medium woodland; jarrah-marri (EmCc);
- Mosaic: Medium open woodland: Jarrah & Marri, with low woodland Banksia/sparse woodland jarrah/marri; and
- Grassland areas: bare paddock areas.

One Priority species as listed by the Wildlife Conservation Act 1950 was located within a remnant vegetation area in the east. This area is not proposed to be disturbed as part of the subdivision development.

The proposed development is utilising already cleared/disturbed areas for infrastructure requirements, with some removal of isolated paddock trees for road/infrastructure requirements. The vegetation in these areas was considered to be in Completely Degraded Condition. It is not anticipated that this development will impact the remnant vegetation areas which are in Good Condition.

The findings in this report are based on the implementation of the following recommendations:

1. Protect the Priority 3 species *Acacia drummondii ssp affinis*, and provide further suitable habitat for the species in the future by fencing the area from stock;
2. Increase the local biodiversity by creating north-south and east-west micro corridors, by linking to the remnant vegetation patches in the east of the subject site and through the north of existing Lot 1;
3. The remnant vegetation areas in the east should be fenced to exclude stock in an effort to increase the biodiversity within these areas and encourage regeneration;
4. A survey of current habitat and feed trees of the Carnaby's and Red tailed black Cockatoo occur of any trees >500mm diameter, depending on the outcome of the survey, possible referral may be required to the Federal Department of Sustainability, Environment, Water, Population and Communities;
5. Applying Development Exclusion Zones over remnant vegetation areas in 'Good Condition' to ensure the long term protection of these areas. A notification on title should be applied to ensure if the land is sold this is known to prospective buyers.

6. Weeds should be controlled on-site and restricted from movement offsite, this can be undertaken by ensuring machines are clean on entry and exit when disturbing any soils or vegetative matter;
7. The Pink Gladiolus (*Gladiolus caryophyllaceus*) is targeted for eradication in the eastern remnant vegetation area; and
8. Continue monitoring the subject area for occurrences of the Declared plant Skeleton Weed (*Chondrilla juncea*) and if located report to DAFWA.

If the above recommendations are implemented the property would assist in achieving the following goals from the Shire of Chittering's local Biodiversity Strategy:

1. **Goal 1 – Retention of natural areas:** through the fencing of all the “Good Condition” vegetation areas and providing linkages to adjacent remnant vegetation.
2. **Goal 2 – Protection of natural areas:** in remnant vegetation areas place “Development Exclusion” and notification on title top prospective buyers.

Bio Diverse Solutions conclude that if the listed recommendations are implemented by the client, the development of rural residential on Lot 1 and 2 Tee Tree Road Bindoon can be implemented sustainably and in an environmentally sound manner.

It is further recommended that if the construction of this development is not undertaken within 5 years of this survey, after that time the Spring Survey should be re-conducted to verify/confirm absence/presence of Threatened Flora species adjacent to proposed disturbance areas.

7. References

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Appendices

Appendix A – Location Mapping

Appendix B – Outline Development Plan

Appendix C – DEC Threatened Flora Report

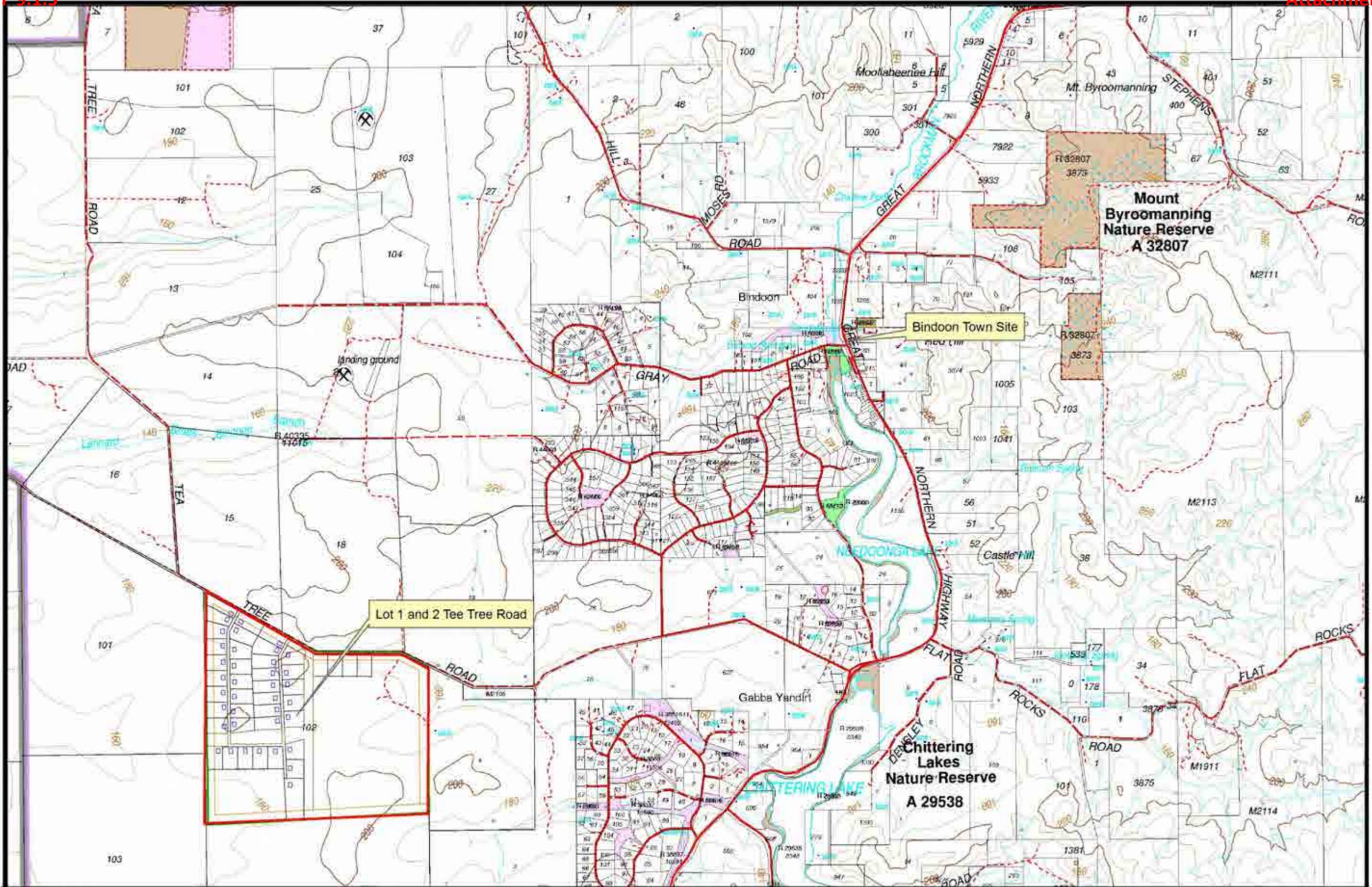
Appendix D – Vegetation Mapping

Appendix E – Flora Species List

Appendix F – Recommendations Mapping

Appendix A

Location Mapping



Legend Subject area	Scale 1:40000 @ A3 	 BIO DIVERSE SOLUTIONS 55 Peppermint Drive Albany, WA 6330 Australia Tel: 08 9841 3936 Fax: 08 9841 3936 Mob: 0447 555 516	CLIENT: Lot 1 and 2 Tee Tree Road Bindoon WA	
			Location Mapping	
			STATUS: FINAL	FILE: WHEL014
				DATE: 20/01/2012

Appendix B

Outline Development Guide Plan

Whelans

Item 9.1.5

Attachment 1

10m road widening of Tea Tree Road

Dwelling construction within 100m FHS to be BAL 12.5

Brennan Road as Strategic Fire Break

Proposed subsector roads 30m wide

Public open space corridors to link areas of high biodiversity

Retention of windmill on Lot 31

Landmarks to retain balance lot for entry and possible incidental tourism uses

Emergency and Fire Service access within POS

Future site for Ukrainian Youth Camp



ADOPTION

Adopted by resolution of the Council of the Shire of Chillingham and the Ordinary meeting of Council held on the _____ day of _____ 2012, and the seal of the municipality was pursuant to the resolution hereto affixed in the presence of:

President: _____

Chief Executive Officer: _____

Date: _____

LEGEND

- 100m Fire Hazard Separation
- Public Open Space
- Strategic Fire Breaks (indicative only)
- Building Envelopes
- Strategic Fire Service Access

PUBLIC OPEN SPACE
 Total Site Area of Lots 1 & 2 = 483 hectares
 Public Open Space provided = 48 hectares (10%)

DEVELOPMENT PLAN LOT YIELD
 Total No. lots proposed = 44
 (including indicative lots on Tea Tree Rd)

- DEVELOPMENT PROVISIONS RELATING TO THE SITE:**
- The Development Plan is subject to the Council and the Western Australian Planning Commission. Subdivision and development should generally be in accordance with the Plan.
 - Development Requirements and LULUs in considering development and subdivision of the land in accordance with the State of Chillingham Local Planning Scheme No. 2 to the Rural Reserve zone apply.
 - Vegetation Provisions: No clearing is permitted, without Planning Commission approval, within the area of the proposed development, unless the clearing is required for the development, or to meet the requirements of the State of Chillingham Local Planning Scheme No. 2 to the Rural Reserve zone apply.
 - Building Envelopes: Buildings, walls, fences and other structures are to be contained within the area of the proposed development, unless the clearing is required for the development, or to meet the requirements of the State of Chillingham Local Planning Scheme No. 2 to the Rural Reserve zone apply.
 - Highway 100 metres: Road - 20 metres, Lane - 2.5 metres, Side - 10 metres.
 - Fire: Lots to have a windmill for the proposed dwelling greater than 1.2 metres above natural ground level, or every 0.3 metres of height above natural ground level, setback distances are to be increased by 2 metres.
 - Fencing: In accordance with Local Planning Policy No. 25 'Fencing', within a lot for the construction of a fence around the building envelope, any previously cleared area and adjoining an unshaded boundary is permitted. However, no boundary fence is permitted in vegetation protection areas or on the easement area, without planning consent of the Council.
 - Discovers: The construction of a driveway to each lot is to be in accordance with Council's specifications.
 - Portable Water: Each dwelling is to have a water supply from roof catchment of a minimum of 120,000 litres, of which 10,000 litres is to be kept in reserve for the lighting purposes and fitted with a standard 60mm main Glandwick pipe.
 - Land Management: The maintenance of any drainage swales, easements, the tracks and vegetation protection and revegetation areas is the responsibility of the owner/occupier.
 - Dams, Dams and Water Courses: The taking of water, construction of dams and extraction of surface water is not permitted without the approval of the Council and relevant State Government department.
 - Fire Control: Strategic Fire Strategy as shown on the Development Plan will be conducted by the Developer and any to be maintained by the applicant prior to the submission of the Chief Executive Officer and the Fire and Emergency Services Authority in accordance with Local Planning Policy No. 21 'Fire Management Plans'.
 - Permitted Uses: In considering development and subdivision of the land in accordance with the State of Chillingham Local Planning Scheme No. 2 to the Rural Reserve zone apply. For any use that may result in degradation of land or water resources or nuisance to neighbours, a development consent may be required as a condition of development approval.
 - Stocking Provisions: Grazing activities are to be restricted to avoid overgrazing in accordance with Local Planning Policy No. 24 'Stocking Rates and Keeping of Animals'.
 - Domestic Pets: The keeping of domestic animals is prohibited.
 - Roofing Materials: All buildings shall be constructed with roofs of non-combustible materials.
 - Waste Disposal: Where indicated on the Development Plan, appropriate facilities are to be provided for waste disposal.
 - Drainage: Subsoil drainage shall be installed to avoid overgrazing in accordance with Local Planning Policy No. 24 'Stocking Rates and Keeping of Animals'.
 - Waste Responsibility: The developer/owner shall ensure appropriate containment of the lots, in relation to the provisions of the Council's Local Planning Scheme relating to the management of the land, as specified in the Development Plan and the Management Plan.

Job Number: 11763
 Sheet Name: 11763-4
 Scale: 1:1500 @ A3
 Date: 25/3/2012
 Drawn By: SJP
 Checked by: JEP
 File: s:\Projects\11763\p\11763-4.dwg
 All dimensions are in metres unless otherwise stated.
 This plan is subject to the provisions of the Development Plan.
 The Council reserves the right to amend the Development Plan at any time without notice.
 The information on this plan is for information only and should not be used for any other purpose.

OUTLINE DEVELOPMENT PLAN
LOTS 1 & 2 TEA TREE ROAD
BINDOON

whelans
 TDA PLANNING

Appendix C

DEC Threatened Flora

Database Search



Department of
Environment and Conservation
Our environment, our future 

Your Ref:
Our Ref: **23-1011FL**
Enquiries: Jessica Donaldson
Phone: (08) 9334 0123
Fax: (08) 9334 0278
Email: jessica.donaldson@dec.wa.gov.au

Bio Diverse Solutions
55 Peppermint Drive
Albany WA 6330

Attention: Kathryn Kinnear

Dear Kathryn Kinnear,

REQUEST FOR RARE FLORA INFORMATION

I refer to your request of 03 October 2011 for Threatened Flora information in the Bindoon area. The search was conducted within a 5km radial area from the central coordinates you submitted.

A search was undertaken for this area of **(1)** the Department's *Threatened (Declared Rare) Flora* database (for results, *if any*, see "DEFL" – coordinates are GDA94), **(2)** the *Western Australian Herbarium Specimen* database for priority species opportunistically collected in the area of interest (for results, *if any*, see "WAHERB"- coordinates are GDA94 – see condition number 9 in the attached 'Conditions in Respect of Supply' and **(3)**, the Department's *Declared Rare and Priority Flora List* [this list is searched using 'place names'. This list, which may also be used as a species target list, contains species that are declared rare (Conservation Code R or X for those presumed to be extinct), poorly known (Conservation Codes 1, 2 or 3), or require monitoring (Conservation Code 4) – for results, *if any*, see "DP List"]. The results are attached electronically to this email.

Attached also are the conditions under which this information has been supplied. Your attention is specifically drawn to the seventh point, which refers to the requirement to undertake field investigations for the accurate determination of rare flora occurrence at a site. *The information supplied should be regarded as an indication only of the rare flora that may be present and may be used as a target list in any surveys undertaken.*

The information provided does not preclude you from obtaining and complying with, where necessary, land clearing approvals from other agencies.

An invoice for \$300 (plus GST) to supply this information will be forwarded.

It would be appreciated if any populations of rare flora you encounter in the area could be reported to this Department to ensure their ongoing management.

If you require any further details, or wish to discuss rare flora management, please contact Dr Ken Atkins, Manager, Species and Communities Branch, on (08) 9334 0455.

Yours faithfully

Jessica Donaldson

.....
for Keiran McNamara
DIRECTOR GENERAL

7 October 2011

Species and Communities Branch

17 Dick Perry Ave, Technology Park, Kensington

Phone: (08) 9334 0455 Fax: (08) 9334 0278

Locked Bag 104, Bentley Delivery Centre, Bentley, Western Australia 6983

www.dec.wa.gov.au

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

RARE FLORA INFORMATION

CONDITIONS IN RESPECT OF SUPPLY OF INFORMATION

1. All requests for data to be made in writing to the Director General, Department of Environment and Conservation, Attention: Threatened Flora Database Officer, Species and Communities Branch.
2. The data supplied may not be supplied to other organisations, nor be used for any purpose other than for the project for which they have been provided, without the prior written consent of the Director General, Department of Environment and Conservation.
3. Specific locality information for Declared Rare Flora is regarded as confidential, and should be treated as such by receiving organisations. Specific locality information for DRF may not be used in public reports without the written permission of the Director General, Department of Environment and Conservation. Publicly available reports may only show generalised locations or, where necessary, show specific locations without identifying species. The Department is to be contacted for guidance on the presentation of rare flora information.
4. Note that the Department of Environment and Conservation respects the privacy of private landowners who may have rare flora on their property. Rare flora locations identified in the data as being on private property should be treated in confidence, and contact with property owners made through the Department of Environment and Conservation.
5. Receiving organisations should note that while every effort has been made to prevent errors and omissions in the data provided, they may be present. The Department of Environment and Conservation accepts no responsibility for this.
6. Receiving organisations must also recognise that the database is subject to continual updating and amendment, and such considerations should be taken into account by the user.
7. **It should be noted that the supplied data do not necessarily represent a comprehensive listing of the rare flora of the area in question. Its comprehensiveness is dependant on the amount of survey carried out within the specified area. The receiving organisation should employ a botanist, if required, to undertake a survey of the area under consideration.**
8. Acknowledgment of the Department of Environment and Conservation as source of the data is to be made in any published material. The unique reference number that is given upon the request for information should be quoted. Copies of all such publications are to be forwarded to the Department of Environment and Conservation, Attention: The Manager, Species and Communities Branch.
9. The development of the PERTH Herbarium database was not originally intended for electronic mapping (eg. GIS ArcView). The latitude and longitude coordinates for each entry are not verified prior to being databased. It is only in recent times that collections have been submitted to PERTH with GPS recorded in latitude and longitude coordinates. Therefore, be aware when using this data in ArcView that some records may not plot to the locality description given with each collection.

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THE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

DECLARED RARE AND PRIORITY FLORA LIST

for Western Australia

CONSERVATION CODES

R: Declared Rare Flora - Extant Taxa

Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.

X: Declared Rare Flora - Presumed Extinct Taxa

Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such.

1: Priority One - Poorly known Taxa

Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

2: Priority Two - Poorly Known Taxa

Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

3: Priority Three - Poorly Known Taxa

Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey.

4: Priority Four - Rare Taxa

Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

Note, the need for further survey of poorly known taxa is prioritised into the three categories depending on the perceived urgency for determining the conservation status of those taxa, as indicated by the apparent degree of threat to the taxa based on the current information.

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ABBREVIATIONS USED IN THREATENED FLORA DATABASE PRINTOUTS

VESTING

AAP	Aboriginal Planning Authority
AGR	Chief Executive, Dep. of Agriculture
ALT	Aboriginal Land Trust
APB	Agricultural Protection Board of WA
BGP	Botanical Gardens & Parks Authority
BSA	Boy Scouts Association
CC	Conservation Commission – NPNCA - LFC
CGT	Crown Grant in Trust
COM	Commonwealth of Australia
CRO	Crown Freehold-Govt Ownership
CRW	Crown
DAG	Dep. of Agriculture
DOW	Dep. of Water
DPI	Dep. of Planning & Infrastructure
EXD	Exec Direc CALM
FES	Fire and Emergency Services Aust.
HOW	Dep. of Housing/State Housing Commission
ILD	Industrial Lands Develop. Auth
LAC	LandCorp
MAG	Minister for Agriculture
MBC	Metropolitan Cemeteries Board
MED	Ministry of Education
MHE	Minister for Health
MIN	Minister for Mines
MPL	Ministry for Planning
MPR	Minister for Prisons
MRD	Main Roads WA
MTR	Minister for Transport
MWA	Minister for Water Resources
MWO	Minister for Works
NAT	Natural Trust of Australia WA
NON	Not Vested
PLB	Pastoral Lands Board
PRI	Private/Freehold
RAI	Public Transport Authority
REL	Religious Organisation
SEC	Synergy (ex Western Power)
SHI	Shire
SPC	State Planning Commission
SWA	State of Western Australia
TEL	Telstra
UNK	Unknown
WAT	Water Corporation
WEL	Minister Community Welfare
WRC	Water & Rivers Commission
XPL	Ex-Pastoral Lease

PURPOSES

ABR	Aboriginal Reserve
ACC	Access Track
AER	Aerodrome
AIR	Airport
ARS	Agricultural Research Station
BAP	Baptist Union of WA
CAM	Camping
CAR	Caravan park
CEM	Cemetery
CFA	Conservation of Fauna
CFF	Conservation Of Flora & Fauna
CFL	Conservation of Flora
CHU	Church
CPK	Car Park
CMN	Communications
COM	Common

CON	Conservation Park
DEF	Defence
DRA	Drain
EDE	Educational Endowment
EDU	Educational purposes UWA
ENE	Enjoyment of Natural Environ.
EXC	Excepted from sale
EXL	Exploration Lease
EXP	Experimental Farm
FIR	Firing Range
FOR	State Forest
GE	General Lease
GHA	Grain Handling
GOL	Golf
GRA	Gravel Pit
GVT	Government Requirements
HAR	Harbour Purposes
HEP	Heritage Purposes
HER	Heritage trail
HOS	Hospital
KEN	Kennels
LPR	Landscape Protection
MIN	Mining lease
MUN	Municipal Purposes
NPK	National Park
NRE	Nature Reserve
OTH	Other
PAR	Parkland (& Recreation)
PAS	Pastoral lease
PFF	Protection of Flora & Fauna
PFL	Protection of Flora
PIC	Picnic ground
PLA	Plantation
POS	Public Open Space
PRS	Prison site
PUR	Purchase Lease
PUT	Public Utility
QUA	Quarry
RAD	Radio Station
RAC	Racecourse
REC	Recreation
REH	Rehabilitation/Re-establish Native Plants
RRE	Railway Reserve
RUB	Rubbish
SAN	Sand
SCH	School-site
SET	Settlers requirements
SHI	Shire Requirements
SHO	Showgrounds
SNN	Sanitary
SOI	Soil Conservation
STO	Stopping place
TIM	Timber
TOU	Tourism
TOW	Town-site
TRA	Training Ground
TRI	Trig station
UCL	Unallocated Crown Land
UNK	Unknown
VER	Road Verge
VPF	Vermin Proof Fence
WAT	Water
WLS	Wildlife Sanctuary
WOO	Firewood

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DECLARED RARE AND PRIORITY FLORA LIST
16 September 2010

SPECIES / TAXON	CONS CODE	DEC REGION	DISTRIBUTION	FLOWER PERIOD
<i>Acacia browniana</i> var. <i>glaucescens</i>	2	MW,SW	Bindoon, Julimar, Mogumber	
<i>Acacia drummondii</i> subsp. <i>affinis</i>	3	MW,SW	Bindoon, Muchea, Julimar, Wannamal, Mullewa, New Norcia, Drummond NR	
<i>Acacia pulchella</i> var. <i>reflexa acuminata</i> bracteole variant (RJ Cumming 882)	3	SW	Wannamal, Bindoon, York, Boonanarring	
<i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>	3	SW,SR	Chidlow, Mundaring, Collie, Bindoon, Muchea, Sawyers Valley	
<i>Asteridea gracilis</i>	3	SW,SC	Gosnells, Mt Saddleback, South Stirling, Gordon Inlet, Bindoon, Helena Valley	Sep-Oct
<i>Asterolasia nivea</i>	T	SW	Bindoon	Aug-Oct
<i>Astroloma</i> sp. <i>Cataby</i> (EA Griffin 1022)	4	MW,SW	Eneabba, Gairdner Range, Cataby, Calingiri, Bindoon, New Norcia	Feb-Jul
<i>Astroloma</i> sp. <i>Nannup</i> (RD Royce 3978)	4	SR,SW,WA	Bindoon, Forest Grove, Nannup, Scott River, Careys Flat, Manjimup (Barlee Brook), Witchcliffe, Abba River, Margaret River	Apr-Jun
<i>Calothamnus pachystachyus</i>	4	MW,SW	Bindoon, Mogumber, New Norcia	Aug-Oct
<i>Commersonia</i> sp. <i>Bindoon</i> (CF Wilkins & F & J Hort CW 2155)	1	SW	Bindoon	
<i>Conostylis caricina</i> subsp. <i>elachys</i>	1	WB,SW	Gunyidi, Goomalling, Dowerin, Bindoon	Aug,Sep
<i>Cyanicula ixiooides</i> subsp. <i>candida</i>	2	SW	Bindoon, Smiths Mill, York, Wooroloo	Sep-Oct
<i>Drosera sewelliae</i>	1	SW	Lower Chittering, Julimar	Oct
<i>Eucalyptus exilis</i>	4	MW,WB,SW	Mt Lesueur, Coorow, Boyagin Rock, Wandering, Bindoon, Gunapin, Coomallo NR, Beverley	Dec-Apr
<i>Gastrolobium crispatum</i>	1	SW	Bindoon, Julimar, Gidgegannup, Mt Byroomanning	Oct
<i>Goodenia arthrotricha</i>	T	SW,MW	Wannamal, Moora, Ellis Brook, Bindoon	Nov,Dec
<i>Grevillea corrugata</i>	T	SW	Bindoon	Aug-Sep
<i>Grevillea drummondii</i>	4	MW,SW	Bindoon, Hay Flat, New Norcia, Yandan Hill	Jun-Oct
<i>Grevillea florida</i>	3	MW,SW	Bindoon, New Norcia, Cataby	Jul-Sep
<i>Hibbertia glomerata</i> subsp. <i>ginginensis</i>	1	SW	Gingin, Bindoon	Jul-Sep
<i>Hibbertia miniata</i>	4	SW	Hay Flat, Bindoon Hill, Julimar, Wannamal	Jul-Oct
<i>Hypocalymma</i> sp. <i>Tea Tree Road</i> (O. Davies OD 171)	1	SW	Bindoon	
<i>Hypocalymma sylvestre</i>	1	SW	Chittering	Aug-Oct
<i>Johnsonia inconspicua</i>	3	SR,SW	South of Carburnup, Yelverton, Bindoon, Julimar, Quindalup	Nov
<i>Lasiopetalum</i> sp. <i>Toodyay</i> (F. Hort 2689)	1	SW	Wannamal, Bindoon Training Area	Sep
<i>Lechenaultia magnifica</i>	1	SW,WB	Bindoon, Julimar SF, Calingiri, Gingin	Nov
<i>Oxymyrrhine coronata</i>	4	SW	Chittering, Bullsbrook, Avon Valley	Dec,Jan
<i>Persoonia sulcata</i>	4	SW,WB,MW	John Forrest N.P., Wongamine N.R., Bindoon, Dardadine, Calingiri	Sep-Nov
<i>Petrophile plumosa</i>	3	MW,SW	Bindoon, Mogumber, New Norcia	Jul-Nov
<i>Schoenus griffinianus</i>	3	MW,WB,SW	Eneabba, Wongan Hills, Greenough, Chittering, Hazelmere, Wanneroo	Oct-Nov

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DECLARED RARE AND PRIORITY FLORA LIST
16 September 2010

SPECIES / TAXON	CONS CODE	DEC REGION	DISTRIBUTION	FLOWER PERIOD
<i>Senecio gilbertii</i>	1	SW,SR	Bindoon, York, Wooroloo, Wilga, Gooseberry Hill	Sep-Nov
<i>Spirogardnera rubescens</i>	T	MW,SW	Bindoon-Eneabba, Alexander Morrison NP	Aug-Nov
<i>Stylidium cymiferum</i>	3	MW,SW	Calingiri, Bindoon, Chittering, Toodyay	Oct
<i>Stylidium glabrifolium</i>	2	SW	Bindoon	Oct
<i>Synaphea grandis</i>	4	MW,SW	Wannamal, New Norcia, Julimar, Muchea, Bindoon, Gingin	Oct-Nov
<i>Synaphea panhesya</i>	1	SW	Bindoon, Mogumber	Aug-Sep
<i>Tetratheca similis</i>	3	SW	Bindoon, Mt Dale area, Wandoo CP	Aug-Sep
<i>Verticordia serrata</i> var. <i>Udumung</i> (D Hunter & B Yarran 941006)	2	SW	Bindoon	Oct

Item 9.1.5

Attachment 1

OID SHEET_NO	SPECIES	CONSCODE	20_1011_WAHERB SITE	VEGETATION	LOCALITY	LAT	LONG_	DATE_
PERTH 00319244	Acacia drummondii subsp. affinis	3	On hillside in lateritic gravel.		22.5 km from Bullsbrook East towards Chittering	-31.4642	116.025	02 08 1973
PERTH 07215134	Acacia drummondii subsp. affinis	3	On high ground between the highway and lake.	Remnant woodland. Contiguous with fringing vegetation on la	Site 7, Great Northern Highway, S of Bindoon	-31.4167	116.0833	09 2005
PERTH 00342750	Acacia pulchella var. reflexa acuminata bracteole varian	3	Road verge.	Eucalyptus calophylla-wandoo woodland.	8 km (5 miles) from Bindoon towards Toodyay	-31.4519	116.09	05 09 1981
PERTH 1616188	Adenanthos cygnorum subsp. chamaephyton	3	Low upland, well drained; shallow grey sand over laterite,	Low Heath C over Low Heath D (Scheme of Muir 1977); Alloca	Private Property, 6.4 km at 250degrees from Bindoon	-31.409	116.0348	24 11 1990
PERTH 07215126	Adenanthos cygnorum subsp. chamaephyton	3	On slope above the highway, adjacent to totally cleared pa	Isolated remnant woodland. Good understorey diversity rema	Site 10, Great Northern Highway, S of Bindoon	-31.4167	116.0833	09 2005
PERTH 01297473	Astroloma sp. Cataby (E.A. Griffin 1022)	4	Yellow gravel soil.	Forest.	7 miles from Bindoon, 50 miles NE of Perth	-31.3833	116.0833	27 04 1957
PERTH 07782160	Chamelaucium sp. Gingin (N.G. Marchant 6)	T	Slope, dry red-brown gravel.	No associated species.	Lot 439 Breera Road, Gingin, lot number on front entry gate shown as 4!	-31.4401	115.9693	03 09 2007
PERTH 847917	Cyanicula ixioiodes subsp. candida	2		Eucalyptus wandoo and E. calophylla woodland over formerly	9 km NNE of Bindoon, access off Stevenson Roac	-31.3833	116.0833	21 09 1986
PERTH 01052683	Gastrolobium nudum	2			Chittering	-31.4414	116.0964	25 09 1956
PERTH 04360745	Grevillea corrugata	T	In gravelly loam.	Beside road in eucalypt forest. Disturbed verge.	Julimar road, 1.3 km from Chittering road, c. 10 km S of Bindoor	-31.4333	116.0667	04 10 1992
PERTH 04360753	Grevillea corrugata	T	In gravelly loam.	Beside road in eucalypt forest. Disturbed verge.	Julimar road, 1.3 km from Chittering road, c. 10 km S of Bindoor	-31.4333	116.0667	04 10 1992
PERTH 04360761	Grevillea corrugata	T	In gravelly loam.	Beside road in eucalypt forest. Disturbed verge.	Julimar road, 1.3 km from Chittering road, c. 10 km S of Bindoor	-31.4333	116.0667	04 10 1992
PERTH 07739028	Hypocalymma sp. Tea Tree Road (O. Davies OD 171)	1	Gentle slope. Damp, brown sand-loam-gravel over laterite.	Low Heath D. Hibbertia hypericoides var. hypericoides, Pentas	In property of Tea Tree Road, Bindoor	-31.4417	116.0547	22 11 2007
PERTH 03259951	Oxymyrrhine coronata	4	Lateritic gravel.	Marginal Jarrah/Wandoo forest.	3.5 km SE of Keating road, Chittering	-31.4414	116.0964	10 12 1981
PERTH 07782152	Ptychosema pusillum	T	Slope, dry white sand.	Low Woodland B over Low Heath Cover Herbs. Banksia menze	Lot 439 Breera Road, Gingin, Plants at NE corner of property on fire brea	-31.4383	115.9716	18 09 2007
PERTH 08202931	Tetratheca pilifera	3	Slope, breakaway. Gully, drainage line. Dry - moist brown li	Eucalyptus wandoo fringing shrubland. Associated species: Tr	350 Bindoon Spring Road, ca 750 m E of the farmhouse, Toodyay Wes	-31.4137	116.0723	08 10 2009
PERTH 07835302	Verticordia rutilastra	3	Sand, flat, private property.	Low Open Woodland of Eucalyptus todiana and Banksia atter	Lot 26 Ioppolo Road, Dandragan Plateua	-31.4548	115.9904	12 10 2008

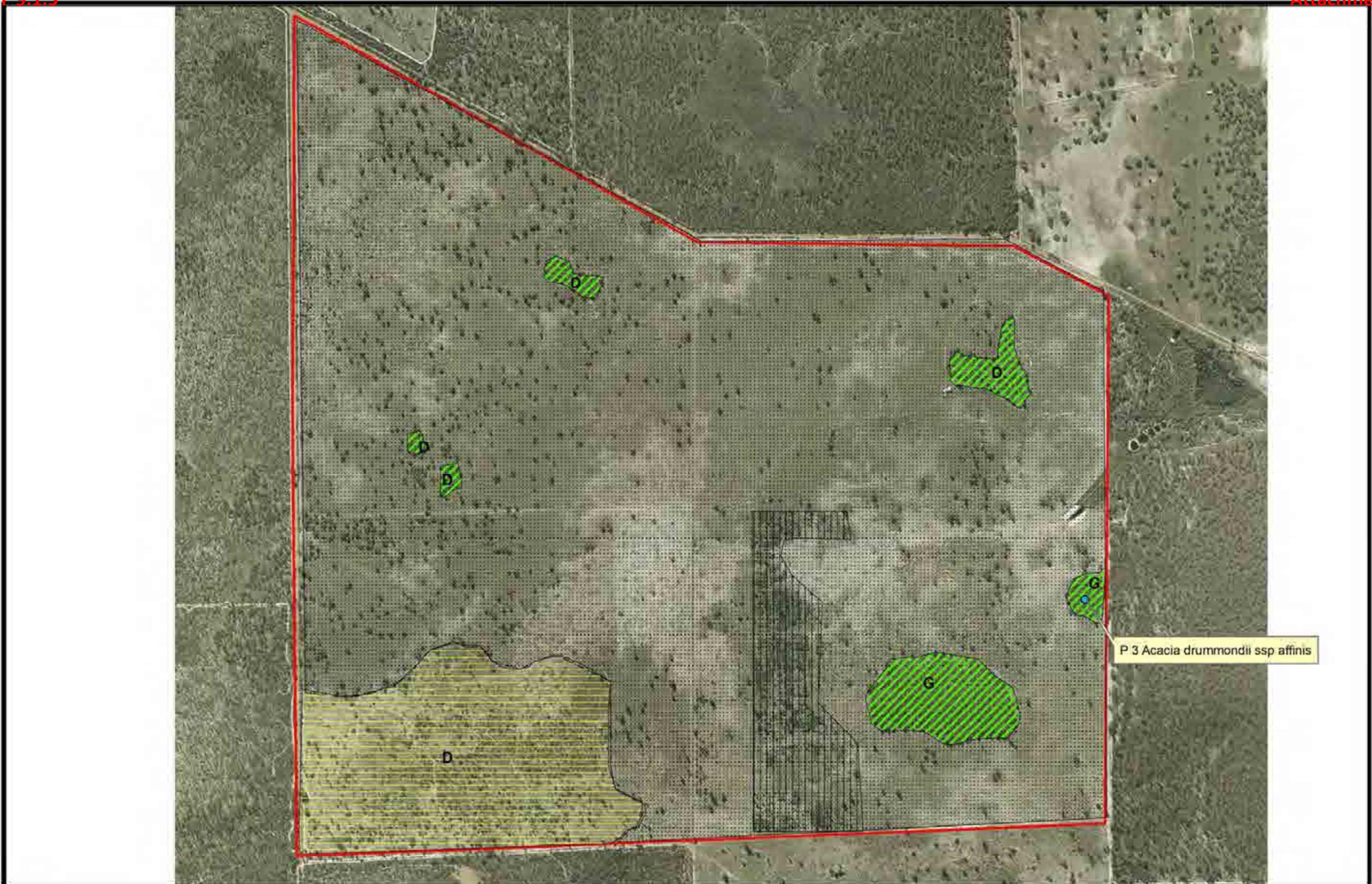
Item 9.1.5

Attachment 1

23_1011 DEFL												
OID_	SHEET	SPNAME	CONSVCOE	POPID1	POPID2	GDA94LAT	GDA94LONG	VESTING	PURPOSE1	PURPOSE2	STATUS	OWNERDATE
	25616	Acacia drummondii subsp. affinis	3		16	-31.41667	116.08333	UNK	UNK			1/09/2005 0:00
	9630	Adenanthos cygnorum subsp. chamaephyton	3		3 A	-31.40322	116.08842	MRD	GRA			26/10/1996 0:00
	9631	Adenanthos cygnorum subsp. chamaephyton	3		3 B	-31.40322	116.08897	SHI	OTH			26/10/1996 0:00
	9632	Adenanthos cygnorum subsp. chamaephyton	3		3 C	-31.40349	116.08869	SHI	VER			26/10/1996 0:00
	9636	Adenanthos cygnorum subsp. chamaephyton	3		3 D	-31.41294	116.09147	SHI	VER			26/10/1996 0:00
	9639	Adenanthos cygnorum subsp. chamaephyton	3		4	-31.43016	116.07814	MRD	VER			26/10/1996 0:00
	9655	Adenanthos cygnorum subsp. chamaephyton	3		11	-31.40905	116.03481	PRI				24/11/1990 0:00
	25678	Adenanthos cygnorum subsp. chamaephyton	3		20	-31.40906	116.03481	PRI				24/11/1990 0:00
	27496	Chamelaucium sp. Gingin (N.G. Marchant 6)	T		7	-31.44006	115.96925	PRI				3/09/2007 0:00
	27494	Ptychosema pusillum	T		3	-31.43828	115.97161	PRI				3/09/2007 0:00

Appendix D

Vegetation Mapping



Legend

- P 3 Acacia drummondii ssp affinis
- Jarrah - Marri JmCc
- Mosaic Jarrah - Marri - Banksia JmCcBa
- Tagasaste plantation
- Cleared Paddock Areas
- Subject area
- G** - Good Condition
- D** - Degraded Condition

Scale
1:11000 @ A3



**BIO
DIVERSE
SOLUTIONS**

55 Peppermint Drive
Albany, WA 6330
Australia
Tel: 08 9841 3936
Fax: 08 9841 3936
Mob: 0447 555 516

CLIENT Lot 1 and 2 Tee Tree Road
Bindoon WA

Vegetation Mapping

STATUS	FILE	DATE
FINAL	WIHEL014	20/01/2012

Appendix E

Flora Species List

Flora species list

Family	Species	Common Name	Weed
FABACEAE	<i>Acacia barbinervis ssp barbinervis</i>		
FABACEAE	<i>Acacia drummondii ssp affinis</i>	P3 #319	
FABACEAE	<i>Acacia pulchella</i>		
FABACEAE	<i>Acacia pulchella var. pulchella</i>		
PROTEACEAE	<i>Adenanthos cygnorum</i>		
ASTERACEAE	<i>Angianthus tomentosus</i>		
HAEMODORACEAE	<i>Anigozanthos humilis</i>	Cats paw	
CASUARINACEAE	<i>Allocasuarina humilis</i>		
ERICACEAE	<i>Astroloma pallidum</i>		
ERICACEAE	<i>Astroloma xerophyllum</i>		
POACEAE	<i>Austrostipa compressa</i>		
POACEAE	<i>Austrodanthonia occidentalis</i>		
POACEAE	<i>Avena sp.</i>	Wild oats	Y
MYRTACEAE	<i>Babingtonia camphorosmae</i>		
MYRTACEAE	<i>Baeckea crispiflora var. tenuior</i>		
MYRTACEAE	<i>Baeckea grandiflora</i>		
PROTEACEAE	<i>Banksia attenuata</i>		
PROTEACEAE	<i>Banksia dallanneyi var. dallanneyi</i>		
PROTEACEAE	<i>Banksia grandis</i>		
PROTEACEAE	<i>Banksia sessilis var. sessilis</i>		
CYPERACEAE	<i>Baumea rubiginosa</i>		
RUTACEAE	<i>Boronia ramosa ssp anethifolia</i>		
FABACEAE	<i>Bossiaea eriocarpa</i>		
BRASSICACEAE	<i>Brassica tournefortii</i>		Y
POACEAE	<i>Bromus diandrus</i>		Y
COLCHICEAE	<i>Burchardia congesta</i>		
HEMEROCALLIDACEAE	<i>Caesia micrantha</i>		
ORCHIDACEAE	<i>Caladenia flava</i>		
PORTULACACEAE	<i>Calandrinia corrigioloides</i>		
MYRTACEAE	<i>Callistemon x citrinus</i>		Y
LAURACEAE	<i>Cassytha flava</i>		
CENTROLEPIDACEAE	<i>Centrolepis drummondiana</i>		
FABACEAE	<i>Chamaecytisus palmensis</i>	Tagasaste	Y
ASPARAGACEAE	<i>Chamaescilla corymbosa</i>	Blue squills	
PROTEACEAE	<i>Conospermum stoechadis</i>		
HAEMODORACEAE	<i>Conostylis setosa</i>		
MYRTACEAE	<i>Corymbia calophylla</i>	Marri	
ASTERACEAE	<i>Cotula coronopifolia</i>	Waterbuttons	Y
CRASSULACEAE	<i>Crassula exserta</i>		
CYPERACEAE	<i>Cyperus brevifolius</i>		Y
CYPERACEAE	<i>Cyperus tenuiflorus</i>		Y
FABACEAE	<i>Daviesia decurrens</i>		

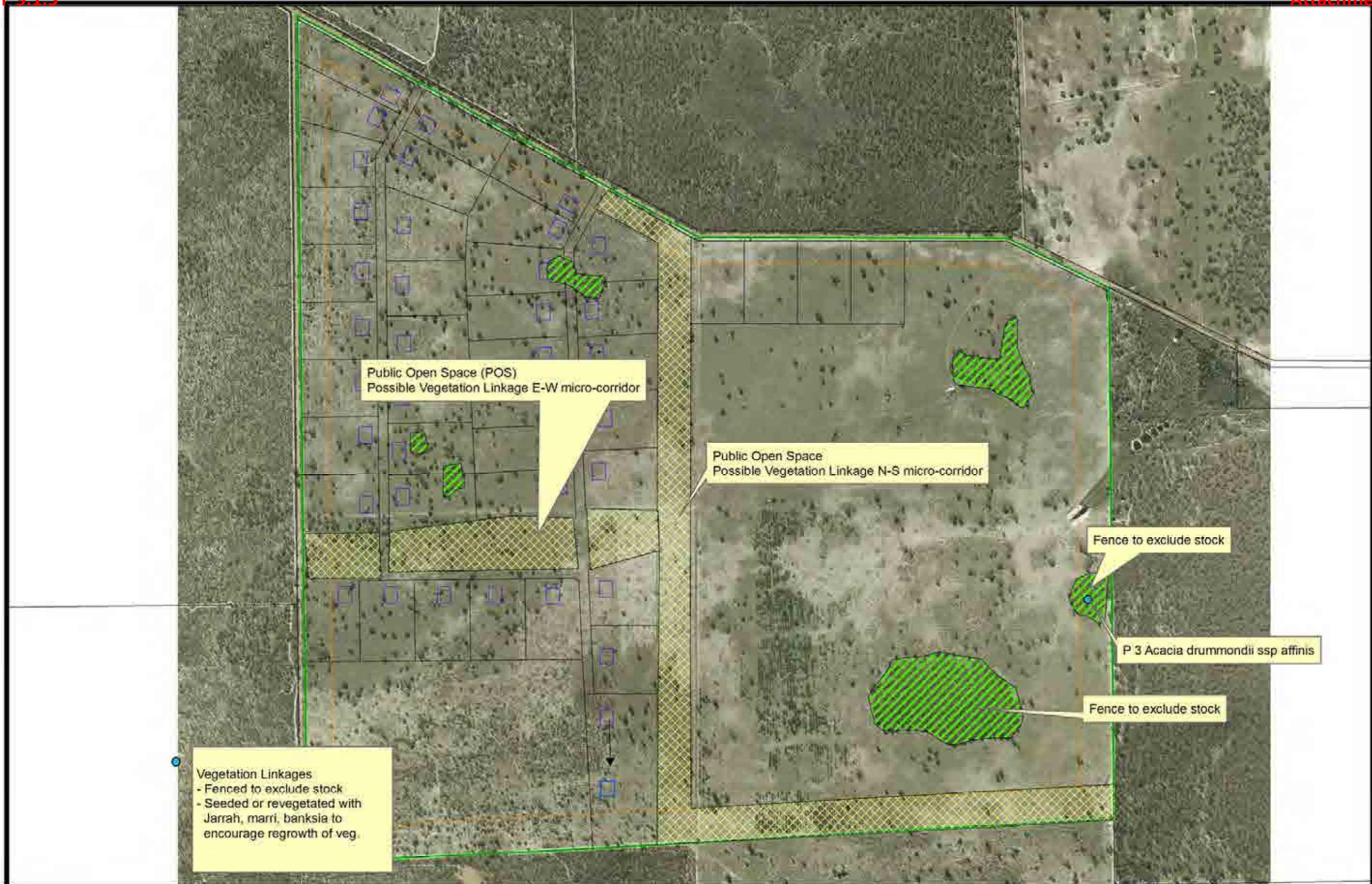
Family	Species	Common Name	Weed
FABACEAE	<i>Daviesia nudiflora</i>		
FABACEAE	<i>Daviesia preissii</i>		
FABACEAE	<i>Daviesia triflora</i>		
RESTIONACEAE	<i>Desmocladius fascicularis</i>		
ASPARAGACEAE	<i>Dichopogon capillipes</i>		
ORCHIDACEAE	<i>Disa bracteata</i>		Y
SCROPHULARIACEAE	<i>Dischisma arenarium</i>		Y
DROSERACEAE	<i>Drosera erythrorhiza</i>		
DROSERACEAE	<i>Drosera glanduligera</i>		
DROSERACEAE	<i>Drosera macrantha</i>		
DROSERACEAE	<i>Drosera pallida</i>		
POACEAE	<i>Ehrharta longiflora</i>	Annual Veldt Grass	Y
ORCHIDACEAE	<i>Elythranthera brunonis</i>	Enamel Orchid	
MYRTACEAE	<i>Eremaea pauciflora</i>		
GERANIACEAE	<i>Erodium botrys</i>		Y
MYRTACEAE	<i>Eucalyptus marginata</i>	Jarrah	
MYRTACEAE	<i>Eucalyptus todtiana</i>		
PROTEACEAE	<i>Grevillea synapheae</i>		
IRIDACEAE	<i>Gladiolus caryophyllaceus</i>	Pink gladiolus	Y
FABACEAE	<i>Gompholobium knightianum</i>		
FABACEAE	<i>Gompholobium tomentosum</i>		
HAEMODORACEAE	<i>Haemodorum venosum</i>		
PROTEACEAE	<i>Hakea lissocarpha</i>		
PROTEACEAE	<i>Hakea ruscifolia</i>		
ASTERACEAE	<i>Helichrysum luteoalbum</i>		Y
DILLENIACEAE	<i>Hibbertia huegelii</i>		
DILLENIACEAE	<i>Hibbertia hypericoides</i>		
DILLENIACEAE	<i>Hibbertia lasiopus</i>		
DILLENIACEAE	<i>Hibbertia racemosa</i>		
DILLENIACEAE	<i>Hibbertia subvaginata</i>		
ASTERACEAE	<i>Hyalospermum cotula</i>		
ASTERACEAE	<i>Hypochaeris glabra</i>		Y
CYPERACEAE	<i>Isolepis marginata</i>		Y
CYPERACEAE	<i>Isolepis prolifera</i>		Y
FABACEAE	<i>Isotropis cuneiformis</i>		
FABACEAE	<i>Jacksonia floribunda</i>		
FABACEAE	<i>Jacksonia sternbergiana</i>		
JUNCACEAE	<i>Juncus pallidus</i>		
JUNCACEAE	<i>Juncus planifolius</i>		
FABACEAE	<i>Kennedia prostrata</i>		
MYRTACEAE	<i>Kunzea glabrescens</i>		
ASTERACEAE	<i>Lagenophora huegelii</i>		
GOODENIACEAE	<i>Lechenaultia biloba</i>		
GOODENIACEAE	<i>Lechenaultia floribunda</i>		

Family	Species	Common Name	Weed
ORCHIDACEAE	<i>Leporella fimbriata</i>	Hare orchid	
MYRTACEAE	<i>Leptospermum erubescens</i>		
MYRTACEAE	<i>Leptospermum spinescens</i>		
ERICACEAE	<i>Leucopogon nutans</i>		
ERICACEAE	<i>Leucopogon propinquus</i>		
CAMPANULACEAE	<i>Lobelia rhombifolia</i>		
ASPARAGACEAE	<i>Lomandra caespitosa</i>		
ASPARAGACEAE	<i>Lomandra hermaphrodita</i>		
ASPARAGACEAE	<i>Lomandra preissii</i>		
ASPARAGACEAE	<i>Lomandra sericea</i>		
FABACEAE	<i>Lotus subbiflorus</i>		Y
ZAMIACEAE	<i>Macrozamia reidlei</i>		
MYRTACEAE	<i>Melaleuca preissiana</i>		
MYRTACEAE	<i>Melaleuca trichophylla</i>		
RESTIONACEAE	<i>Mesomelaena pseudostygia</i>		
POACEAE	<i>Neurachne alopecuroidea</i>		
LORANTHACEAE	<i>Nuytsia floribunda</i>		
FABACEAE	<i>Ornithopus compressus</i>		Y
FABACEAE	<i>Ornithopus sativus</i>		Y
OROBANCHACEAE	<i>Orobanche minor</i>		Y
SCROPHULARIACEAE	<i>Parentucellia viscosa</i>		Y
IRIDACEAE	<i>Patersonia occidentalis</i>		
GERANIACEAE	<i>Pelargonium capitatum</i>		
POACEAE	<i>Pentaschistis airoides</i>		Y
POLYGONACEAE	<i>Persicaria decipiens</i>		Y
PROTEACEAE	<i>Petrophile linearis</i>		
PROTEACEAE	<i>Petrophile macrostachya</i>		
PROTEACEAE	<i>Petrophile striata</i>		
CARYOPHYLLACEAE	<i>Petrorhagia dubius</i>		Y
RUTACEAE	<i>Philothea spicata</i>		
LOGANIACEAE	<i>Phyllangium paradoxum</i>		
EUPHORBIACEAE	<i>Phyllanthus calycinus</i>		
ASTERACEAE	<i>Podotheca gnaphalioides</i>		
POACEAE	<i>Polypogon monspeliensis</i>	Annual beardgrass	Y
ORCHIDACEAE	<i>Pterostylis nana</i>		
ORCHIDACEAE	<i>Pterostylis vittata</i>		
ORCHIDACEAE	<i>Pyrorchis nigricans</i>		
ASTERACEAE	<i>Rhodanthe citrina</i>		
IRIDACEAE	<i>Romulea rosea</i>	Guildford grass	Y
MYRTACEAE	<i>Scholtzia involucrata</i>		
ASTERACEAE	<i>Sonchus asper</i>		Y
ASTERACEAE	<i>Sonchus oleraceus</i>	Sowthistle	Y
STYLIDACEAE	<i>Stylidium hispidum</i>		
STYLIDACEAE	<i>Stylidium calcaratum</i>		

Family	Species	Common Name	Weed
PROTEACEAE	<i>Synaphea spinulosa</i>		
CYPERACEAE	<i>Tetaria octandra</i>		
TREMANDRACEAE	<i>Tetradlea hirsuta</i>		
FABACEAE	<i>Trifolium arvense</i>	Hare's foot clover	Y
FABACEAE	<i>Trifolium dubium</i>		Y
FABACEAE	<i>Trifolium hirtum</i>	Rose clover	Y
FABACEAE	<i>Trifolium subterraneum</i>	Subclover	Y
CELASTRACEAE	<i>Tripterococcus brunonis</i>		
ORCHIDACEAE	<i>Thelymitra sp</i>		
TYPHACEAE	<i>Typha domingensis</i>		
ASPARAGACEAE	<i>Thysanotus patersonii</i>		
ASPARAGACEAE	<i>Thysanotus tenellus</i>		
APIACEAE	<i>Trachymene pilosa</i>		
HEMEROCALLIDACEAE	<i>Tricoryne elatior</i>		
ASTERACEAE	<i>Ursinia anthemoides</i>		Y
ASTERACEAE	<i>Vellereophyton dealbatum</i>		Y
POACEAE	<i>Vulpia myuros</i>		Y
CAMPANULACEAE	<i>Wahlenbergia capensis</i>		Y
XANTHORRHOEACEAE	<i>Xanthorrhoea preissii</i>		
Count	149		37

Appendix F

Recommendations Mapping



Vegetation Linkages
 - Fenced to exclude stock
 - Seeded or revegetated with Jarrah, marri, banksia to encourage regrowth of veg.

Public Open Space (POS)
 Possible Vegetation Linkage E-W micro-corridor

Public Open Space
 Possible Vegetation Linkage N-S micro-corridor

Fence to exclude stock

P 3 Acacia drummondii ssp affinis

Fence to exclude stock

<p>Legend</p> <ul style="list-style-type: none"> ● P 3 Acacia drummondii ssp affinis Vegetative Linkages Jarrah - Marri JmCc 	<p>Scale 1:11000 @ A3</p>  	 <p>BIO DIVERSE SOLUTIONS</p> <p>55 Peppermint Drive Albany, WA 6330 Australia Tel: 08 9841 3936 Fax: 08 9841 3936 Mob: 0447 555 516</p>	<p>CLIENT: Lot 1 and 2 Tee Tree Road Bindoon WA</p> <p style="text-align: center;">Recommendations Mapping</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">STATUS: FINAL</td> <td style="width: 33%;">FILE: WHEL014</td> <td style="width: 33%;">DATE: 20/01/2012</td> </tr> </table>	STATUS: FINAL	FILE: WHEL014	DATE: 20/01/2012
STATUS: FINAL	FILE: WHEL014	DATE: 20/01/2012				



APPENDIX 4

DRAFT STRUCTURE PLAN



Indicative PDHW
as per MRWA advice
Feb 2016. Alignment
subject to change

LEGEND

100m Fire Hazard Separation	Indicative Building Envelopes (2000m ²)
Strategic Fire Breaks (indicative only)	Strategic Fire Service Access
Rural Small Holdings	Vegetation Protection & Development Exclusion Areas
Perth - Darwin Highway	Indicative lot layout subject to further refinement @ subdivision stage

Plan No. : 11763-13
Revision : REV.3
Scale : 1:10000@A3



LEGEND

Contours
Existing Boundary
Proposed Boundary
Application Area

**PLAN 1: STRUCTURE PLAN
LOTS 1 & 2 TEATREE ROAD
BINDOON**

DATE/DRAWN: 11/07/2016 FILE: 18002 structure plan bindoon.dwg
DRAWN BY: Code V.DATUM AND
CHECKED BY: SF K.BATJEMOOR 001



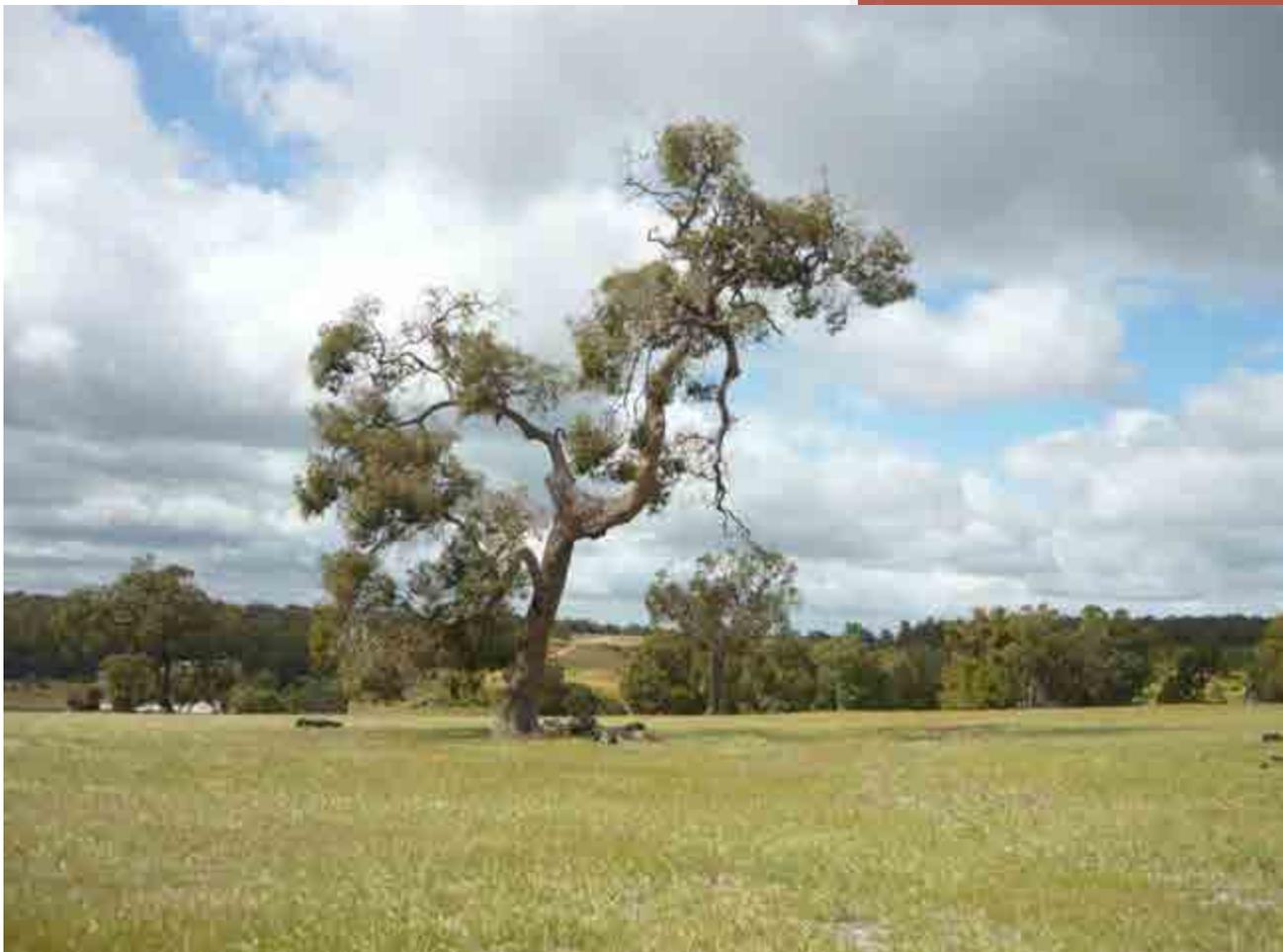


APPENDIX 5

Bushfire Management Plan

**Lots 1 and 2 Tea
Tree Road,
Bindoon WA**

Bushfire Management Plan



13/06/2016

Kathryn Kinnear

Bio Diverse Solutions

DOCUMENT CONTROL

TITLE

Lot 1 and 2 Tea Tree Road Bindoon Bushfire Management Plan

Author (s): Kathryn Kinnear

Reviewer (s): Steve Fernandez

Job No.: WHEL014

Client: Marou Property Development Pty Ltd

REVISION RECORD

Revision	Summary	Revised By	Date
Draft	Client review	Whelans	14/2/12
Final	Client		15/3/12
Final	Issued to client with SP changes & review of legislation/guidelines	Kathryn Kinnear	17/04/2015
Final ID 24/8/2015	Updated SP	Kathryn Kinnear	24/08/2015
Final ID 13/6/2016	Updated to reflect new legislation	Kathryn Kinnear	13/6/2016

DISCLAIMER

The recommendations and measures contained in this assessment report are based on the requirements of the Australian Standards 3959 – Building in Bushfire prone Areas, WAPC SPP3.7, Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015) and CSIRO’s research into Bushfire behaviour. These are considered the minimum standards required to balance the protection of the proposed dwelling and occupants with the aesthetic and environmental conditions required by local, state and federal government authorities. They DO NOT guarantee that a building will not be destroyed or damaged by a bushfire. All surveys and forecasts, projections and recommendations made in this assessment report and associated with this proposed dwelling are made in good faith on the basis of the information available to the fire protection consultant at the time of assessment. The achievement of the level of implementation of fire precautions will depend amongst other things on actions of the landowner or occupiers of the land, over which the fire protection consultant has no control. Notwithstanding anything contained within, the fire consultant/s or local government authority will not, except as the law may require, be liable for any loss or other consequences (whether or not due to negligence of the fire consultant/s and the local government authority, their servants or agents) arising out of the services rendered by the fire consultant/s or local government authority.



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CONTENTS

1. INTRODUCTION4

1.1. STATUTORY CONDITIONS4

1.2. SUITABLY QUALIFIED BUSHFIRE CONSULTANT5

1.3. OTHER DOCUMENTS RELATING TO THIS PLAN5

2. AIMS OF THIS PLAN6

2.1. PLANNING CONTEXT6

2.2. SITE INSPECTION6

2.3. OBJECTIVES6

3. DESCRIPTION OF THE AREA7

3.1. LOCATION7

3.2. DEVELOPMENT PROPOSAL7

4. DESKTOP ASSESSMENT – REGIONAL SETTING8

4.1. CURRENT SITE LAND USE8

4.2. CLIMATE8

4.2.1. RAINFALL9

4.2.2. TEMPERATURE9

4.2.3. WIND10

4.3. PREVALENT FIRE WEATHER11

4.3.1. CLIMATE CHANGE11

4.4. TOPOGRAPHY11

4.5. BUSHFIRE FUELS – VEGETATION11

4.6. ASSETS16

4.7. ACCESS16

4.8. WATER SUPPLY16

4.9. FIREBREAKS17

5. POTENTIAL FIRE ISSUES AND FIRE RISK18

6. BUSHFIRE MANAGEMENT/MITIGATION PLAN20

6.1. ELEMENT 1: LOCATION-20

6.1.1. RECOMMENDATIONS ARISING FROM ASSESSMENT TO THIS ELEMENT20

6.2. ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT21

6.2.1. ASSET PROTECTION ZONES (APZ) (ACCEPTABLE SOLUTION A2.1)21

6.2.2. HAZARD SEPARATION (ACCEPTABLE SOLUTION A2.2)22

6.2.3. RECOMMENDATIONS ARISING FROM ASSESSMENT TO THIS ELEMENT23

6.3. ELEMENT 3: VEHICLE ACCESS - PERFORMANCE CRITERIA25

6.3.1. TWO ACCESS WAYS (A.3.1)25

6.3.2. PUBLIC ROADS (A.3.2)25

6.3.3. CUL DE SACS (A3.3)26

6.3.4. BATTLE AXES (A3.4)26

6.3.5. PRIVATE DRIVEWAYS (A3.5)26

6.3.6. EMERGENCY ACCESS WAYS (A3.6)26

6.3.7. FIRE SERVICE ACCESS (A3.7)26

6.3.8. SIGNAGE26

6.3.9. GATES27

6.3.10. INDIVIDUAL FIRE BREAKS (A3.8)27

6.4. ELEMENT 4 WATER – PERFORMANCE CRITERIA28

6.5. OTHER BUSHFIRE MITIGATION PROCEDURES28

6.5.1. LANDSCAPING/STREETSCAPING AREAS28

6.5.2. STAGED DEVELOPMENT28

6.5.3. EVAPORATIVE AIR CONDITIONERS29

7. SHIRE OF CHITTERING FIRE PROTECTION PLAN30

7.1. FIRE FIGHTING FACILITIES30

7.2. HOMEOWNER PROTECTION30

7.3. BUSHFIRE PLAN30

8. SUMMARY33

8.1. OVERALL FIRE THREAT33

8.2. FUTURE LOT OWNERS RESPONSIBILITY33

8.3. DEVELOPERS RESPONSIBILITY34

8.4. SHIRE OF CHITTERING RESPONSIBILITY35

9. CHECKLIST FOR COMPLIANCE TO AND GUIDELINES FOR PLANNING IN BUSHFIRE PRONE AREAS AND SPP 3.736

9.1. CHECKLIST TO COMPLIANCE TO GUIDELINES FOR PLANNING IN BUSHFIRE PRONE AREAS36

9.2. CHECKLIST TO COMPLIANCE TO SPP3.7 POLICY MEASURES37

9.3. RECOMMENDATIONS/CONCLUSIONS BASED ON ABOVE CHECKLISTS38

10. REFERENCES39

APPENDICES

- APPENDIX A – LOCATION MAPPING
- APPENDIX B – STRUCTURE DEVELOPMENT PLAN
- APPENDIX C – VEGETATION MAPPING
- APPENDIX D – BUSHFIRE HAZARD LEVEL MAPPING
- APPENDIX E – BAL CONTOUR PLAN
- APPENDIX F – DFES INFORMATION FOR THE HOMEOWNER
- APPENDIX G - BUSHFIRE MANAGEMENT PLAN



1. Introduction

Marou Property Development Pty Ltd commissioned Bio Diverse Solutions (Bushfire Consultants) to undertake a fire hazard assessment and prepare a Bushfire Management Plan to guide all future fire management for the proposed subdivision development of Lots 1 and 2 Tea Tree Road, Bindoon.

The basic requirements of any Bushfire Management Plan (BMP) is to identify potential issues or problems relating to environmental fire threats and recommend specific actions by certain persons, agencies, authorities and developers to ensure, as much as practical, that the lives and assets of the location are not put at undue threat from any unplanned fire event. A BMP takes into account various physical attributes of the land, including topographical and vegetation properties, local climatic impacts, past and current land use, past fire history and management practices, local authority fire management obligations, road access, water supplies, adjacent property and tenure, and future obligations by various parties should the subdivision application be successful.

Such planning takes into consideration standards and requirements specified in various documents such as Australian Standard (AS) 3959-2009, Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015) and State Planning Policy 3.7 (WAPC, 2015). These plans and guidelines have developed to ensure uniformity to bushfire management with interpretation of onsite vegetation types, site design, and building standards.

1.1. Statutory Conditions

This Bushfire Management Plan (BMP) has been prepared for Lot 1 and 2 Tea Tree Road Bindoon (refer to Appendix A for location of subject site) to address fire management issues associated with the proposed Structure Plan (SP) and is consistent with State and Local Government planning instruments.

On the 7th December 2015 the *Fire and Emergency Services (Bush Fire Prone Areas) Order 2015; Planning and Development (Local Planning Scheme) Amendment Regulations 2015; Planning and Development Act 2005 State Planning Policy 3.7 - Planning in Bushfire Prone Areas* and the *Building Amendment Regulations (No.3)* were published in the WA Government Gazette. The Western Australian State Bushfire Prone Mapping was also publicly released.

This means that:

- **Emergency Services (Bush Fire Prone Areas) Order 2015:** 4 (1) *The areas of the state described in the Bushfire Prone Areas dataset are designated as bush fire prone areas.*
- **Planning and Development (Local Planning scheme) Amendment Regulations 2015:** *Planning regulations that instigates a planning action if a dwelling is located in the Bushfire Prone Area Mapping. Can be a site specific BAL Assessment, BAL Contour Map, Bushfire Hazard Assessment or a Bushfire Management Plan action. If BAL 12.5 to BAL 29 dwelling can go straight to Building Application. If BAL 40 or BAL FZ then the development goes back into the planning system for assessment.*
- **Planning and Development Act 2005 State Planning Policy 3.7 (SPP 3.7)- Planning in Bushfire Prone Areas:** *The intent of this policy is to implement effective, risk based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure. The application of SPP 3.7 applies to all higher order strategic planning documents, strategic planning proposals, subdivision and development applications located in designated bushfire prone areas.*
- **Building Amendment Regulations (No.3):** *Outlines the definition of the bushfire prone area as designated under the Fire and Emergency Services Act 1998 Regulation 31BA applicable building standards for buildings and incidental structures in bushfire prone areas.*

(WA Australian Government Gazette, 2015)

The publicly released bushfire prone mapping (Bushfire Prone Area Mapping, OBRM, 8/12/15) outlines the site to be Bushfire Prone as per the above regulations, as it is situated within 100m of

>1 ha of bushfire prone vegetation. Refer to extract from the Office of Bushfire Risk Management (OBRM) as released in December 2015 Appendix A.

This document and the recommendations contained are aligned to the following policy and guidelines:

- AS 3959-2009 “Construction of Buildings in Bushfire Prone Areas” current and endorsed standards;
- State Planning Policy 3.7 (SPP 3.7) Planning in Bushfire-Prone Areas (2015);
- Guidelines for Planning in Bushfire Prone Areas (2015);
- *Fire and Emergency Services (Bush Fire Prone Areas) Order 2015;*
- *Planning and Development (Local Planning Scheme) Amendment Regulations 2015;*
- *Bushfires Act 1954;* and
- Shire of Chittering Annual Fire Break Notice.

1.2. Suitably Qualified Bushfire Consultant

This BMP has been prepared by Kathryn Kinnear (nee White), who has 10 years operational fire experience with the (formerly) DEC (1995-2005) and has the following accreditation in Bushfire Management:

- Incident Control Systems;
- Operations Officer;
- Prescribed Burning Operations;
- Fire and Incident Operations;
- Wildfire Suppression 1, 2 & 3;
- Structural Modules – Hydrants and hoses, Introduction to Structural Fires, and Fire extinguishers; and
- Ground Controller.

Kathryn Kinnear currently has the following Tertiary Qualifications:

- BAS Technology Studies & Environmental Management;
- Diploma Business Studies; and
- Graduate Diploma of Environmental Management.

Kathryn Kinnear is an accredited a Level 1 BAL Assessor (Accreditation No: BPAD30794) and is classified as an “Experienced Level 2/3 Practitioner” pending accreditation. Kathryn Kinnear is presently a member of Fire Protection Australia Association and a committee member of the Bushfire Subcommittee Western Australia. Kathryn is a suitably qualified Bushfire Practitioner to prepare this Bushfire Management Plan.

1.3. Other documents relating to this plan

Other documents that have been prepared for this subdivision proposal which should be consulted when reading this plan include:

- Lot 1 and 2 Tea Tree Road Planning Report – Whelans (2015);
- Vegetation Assessment – Bio Diverse Solutions (2012); and
- Land Capability Report – Landform Research (2000).

2. Aims of this Plan

The aim of this Plan is to reduce the occurrence of, and minimise the impact of bushfires, thereby reducing the threat to life, property and the environment. This BMP has been prepared by Bio Diverse Solutions (Bushfire Consultants) with the “subject site” being Lots 1 and 2 Tea Tree Road, Bindoon see Appendix A.

2.1. Planning Context

The BMP has been prepared to support an Structure Plan (SP) at Lots 1 and 2 Tea Tree Road, Bindoon, refer to Appendix B.

2.2. Site inspection

To ensure that every aspect of the proposed subdivision meets the planning requirements as set in the Guidelines for Planning in Bushfire Protection (WAPC, 2015a), a site inspection was initially undertaken on the 13th October 2011 by Kathryn Kinnear (Bio Diverse Solutions) to assess the vegetation and the site conditions. A subsequent site visit was undertaken in March 2016 to assess any change in the classifiable vegetation to AS3959-2009.

The site was assessed as having an **Extreme- Moderate** Bushfire Hazard Level (BHL) due to internal and external patches of forest, woodland and scrub remnant native vegetation areas. Upon completion there will be internal (built/rural small holdings) areas of **Moderate - Low** BHL. Where a subdivision is located within an extreme or moderate BHL, the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015a) requires assessment to the bushfire protection criteria – a process where subdivisions are assessed for compliance to the criteria. The bushfire protection criteria (Appendix 4, WAPC, 2015a) are a performance based criteria in assessing bushfire risk management measures and they outline four “Elements”. The “Elements” which are to be met either through the objectives of the “Performance Principle” or “Acceptable Solutions” (WAPC, 2015a) for the subject site include:

- Element 1 - Location;
- Element 2 - Siting and design of development.
- Element 3 - Vehicular access; and
- Element 4 – Water.

(WAPC, 2015)

This BMP has been prepared to assess the site against the “Acceptable Solutions” of the bushfire protection criteria.

2.3. Objectives

The objectives of this BMP are:

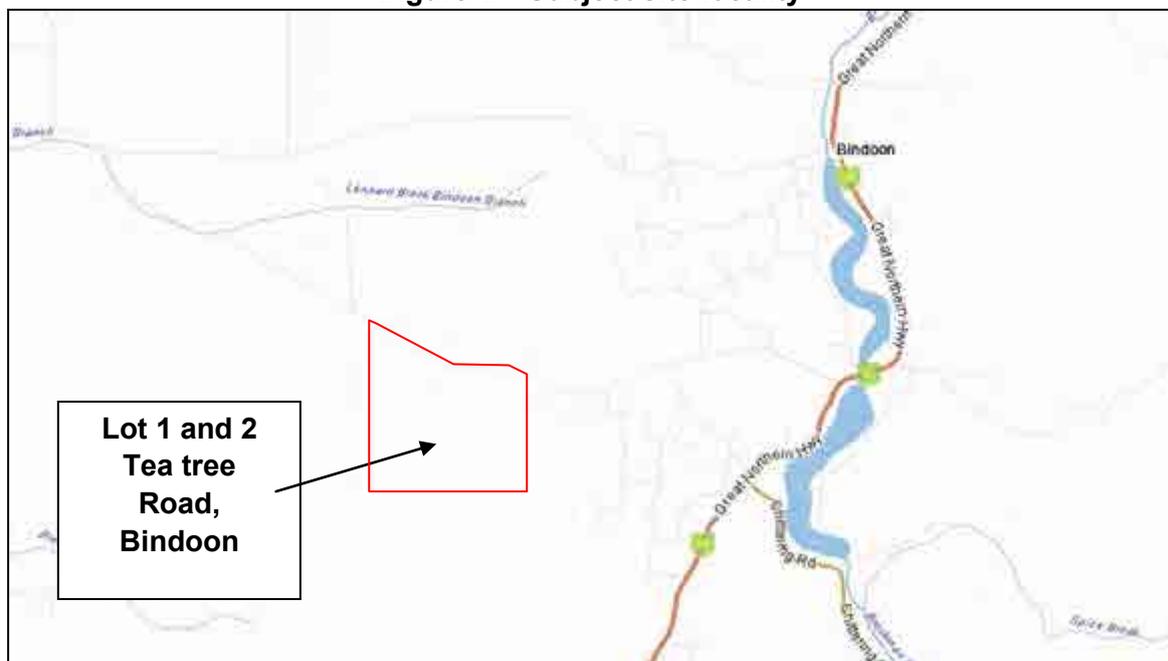
- Achieve consistency with objectives and policy measures of SPP 3.7 (WAPC, 2015b);
- Assess any building requirements to AS3959-2009 (current and endorsed standards) and BAL Construction;
- Assess the subdivision proposal against the Bushfire Protection Criteria Acceptable Solutions as outlined in the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015a);
- Understand and document the extent of the bushfire risk and hazards to the subject site
- Prepare bushfire mitigation and management measures of all land within the subject area with due regard to people, property, infrastructure and the environment;
- Nominate individuals and organisations responsible for bushfire management and associated works within the subject area; and
- Aligned to the recommended assessment procedure (SPP3.7, WAPC, 2015b) & Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015a) which evaluates the effectiveness and impact of proposed, as well as existing, bushfire risk management measures and strategies.

3. Description of the area

3.1. Location

The subject site is located south of Tea Tree Road and east of Brennan Road, approximately 10 km's south of Bindoon town site in the municipality of the Shire of Chittering (SoC). The subject site is a 484ha rural lot which has been used for primarily for the grazing of stock. Please refer to Figure 1 below - Locality Map, and Site Location Mapping Appendix A.

Figure 1 – Subject site locality



3.2. Development proposal

The development proposal includes the creation of 48 lots (47 Rural Small Holding zoning and 1 Rural zoning lot). The Rural Small Holding lots are ranging in size from 5.01ha to 5.44ha. In creating the subdivision the developer proposes to implement “Vegetative Corridors” to increase linkages to remnant vegetation from the north-south and east-west.

Please refer to the Structure Plan as provided by Whelans, Appendix B.

4. Desktop Assessment – Regional Setting

4.1. Current site land use

The site is currently 2 rural lots of predominantly cleared paddocks with grasslands and small isolated patches of remnant vegetation, newly installed vineyards and tagasaste plantation. Historically the subject area has been used for sheep and cattle grazing. An abandoned shack exists in Lot 1 (south west corner) and some shed buildings are located in Lot 2 associated with the rural activities. Please refer to Photograph 1 to 3 below.



Photograph 1 – View of abandoned shack in Lot 1 (south west of subject area).



Photograph 2 – View of shed infrastructure in Lot 2, associated with rural activities.



Photograph 3 – View of stock on site.

4.2. Climate

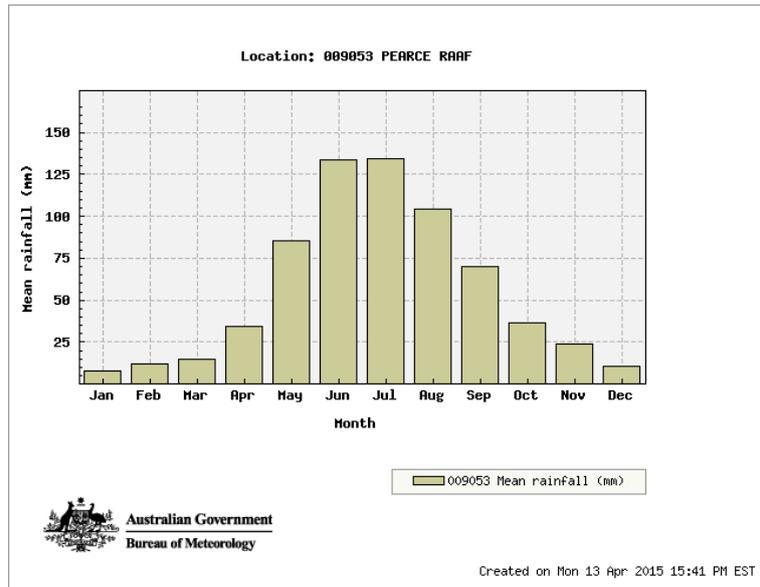
Bindoon has similar climate to Perth (75 Km away) and thus has been described as per Bureau of Meteorology (BoM) descriptions of Perth. Perth experiences a Mediterranean climate, characterised by hot, dry summers and mild, wet winters. These seasons extend into the autumn and spring months, which are transitional periods between the main seasons.

The climate of the region is strongly influenced by the position of the axis of the band of high pressure known as the sub-tropical ridge, and in the warmer months by the development in the easterlies to the north of the ridge of a trough of low pressure near the West Coast. For much of the year the ridge is located to the south allowing the east or south easterly winds to prevail. During the cooler months the ridge periodically moves to the north allowing cold fronts to pass over the west coast and deliver much of the annual rainfall. Sometimes these fronts interact with tropical cloud bands from the northwest and this can enhance the amount of rainfall produced.

4.2.1. Rainfall

The annual mean rainfall of 678.3 mm (BoM, 2015) occurs on 119 rain days, of which 80% usually falls between May and September. Rain occurs on four days out of every seven on average during winter. Flooding is rare in Perth, however heavy rain may be produced by strong winter cold fronts or, less frequently, by summer storms or, more rarely, by decaying tropical cyclones. The highest daily rainfall is 120.6 mm recorded on 9 February 1992. In contrast to winter rainfall, the mean summer rainfall is just 36 mm on an average of 10 rain days. It is not unusual for there to be extended dry periods during the warmer months. Please refer to Pearce RAAF BoM rainfall records (closest climate statistics), Annual Rainfall graph below (Figure 2).

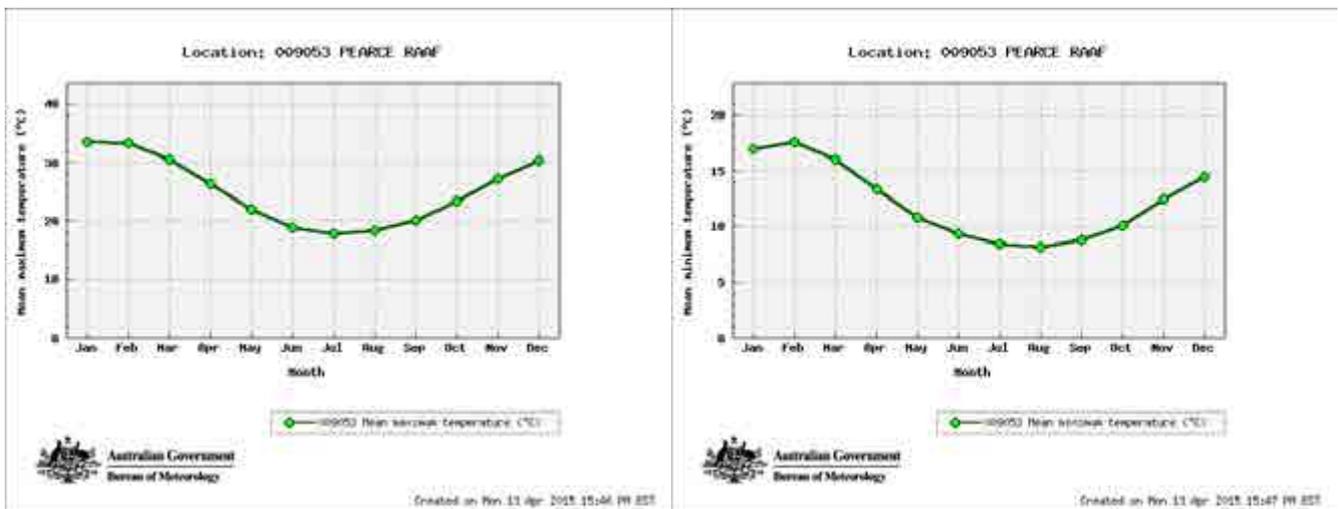
Figure 2 – BoM Rainfall for Pearce (BoM) Station 9053



4.2.2. Temperature

Mean monthly air temperature range from 33.5°C in January to 17.8°C in July (BoM, 2015). Summer maximum temperatures are strongly dependent upon the arrival time of the reliable sea breezes. On some days the difference between the maximum temperatures on the coast and the eastern suburbs may exceed 10°C. Heatwaves are associated with strong easterly winds and the late arrival or absence of the sea breeze. The highest temperature ever recorded is 46.2°C, however, the temperature exceeds 40°C on only three days per year on average. The average minimum temperature ranges from just 8.2°C in August to 17.6°C in February (BoM, 2015). Temperatures below 5°C are not uncommon during any of the winter months. Please refer to average temperatures below for Gingin (40km away), Figure 3.

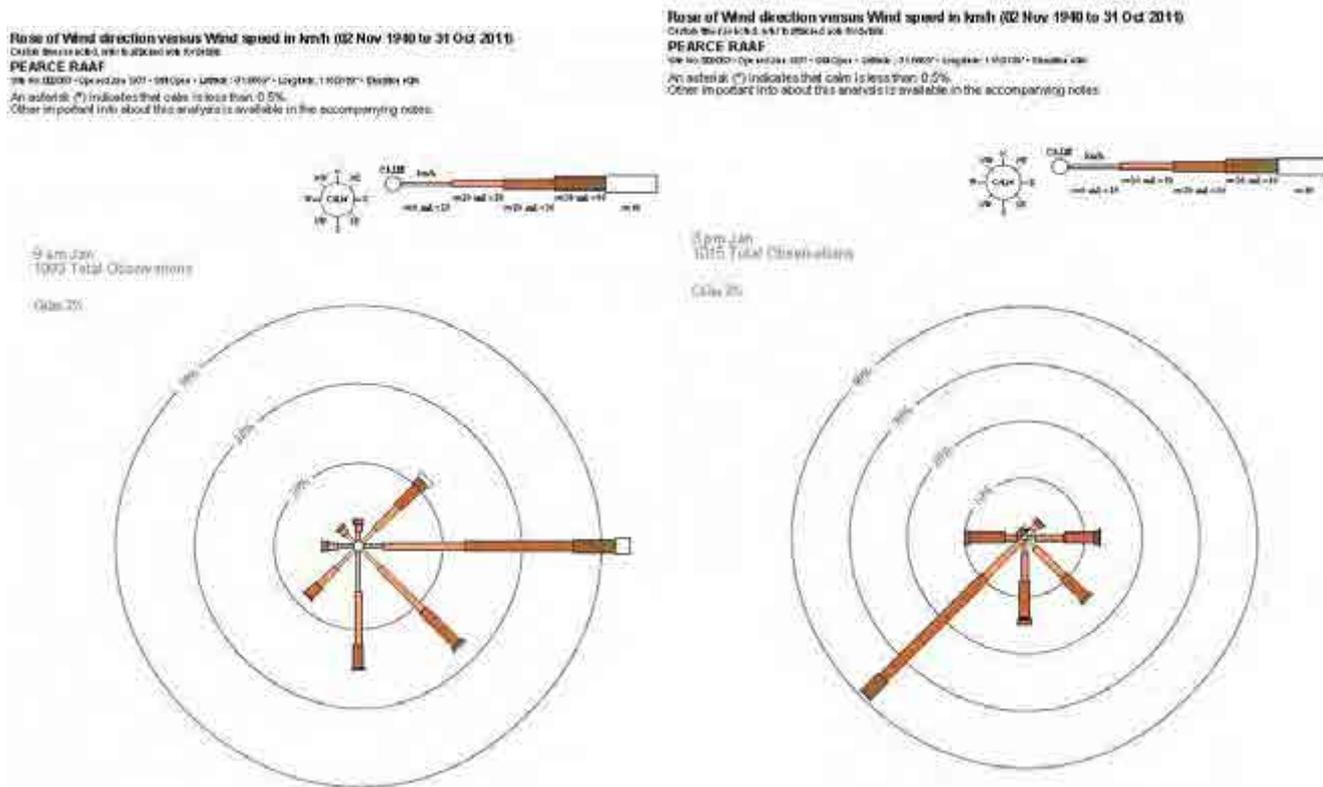
Figure 3 – Average Temperatures BoM Pearce RAAF (BoM 9053)



4.2.3. Wind

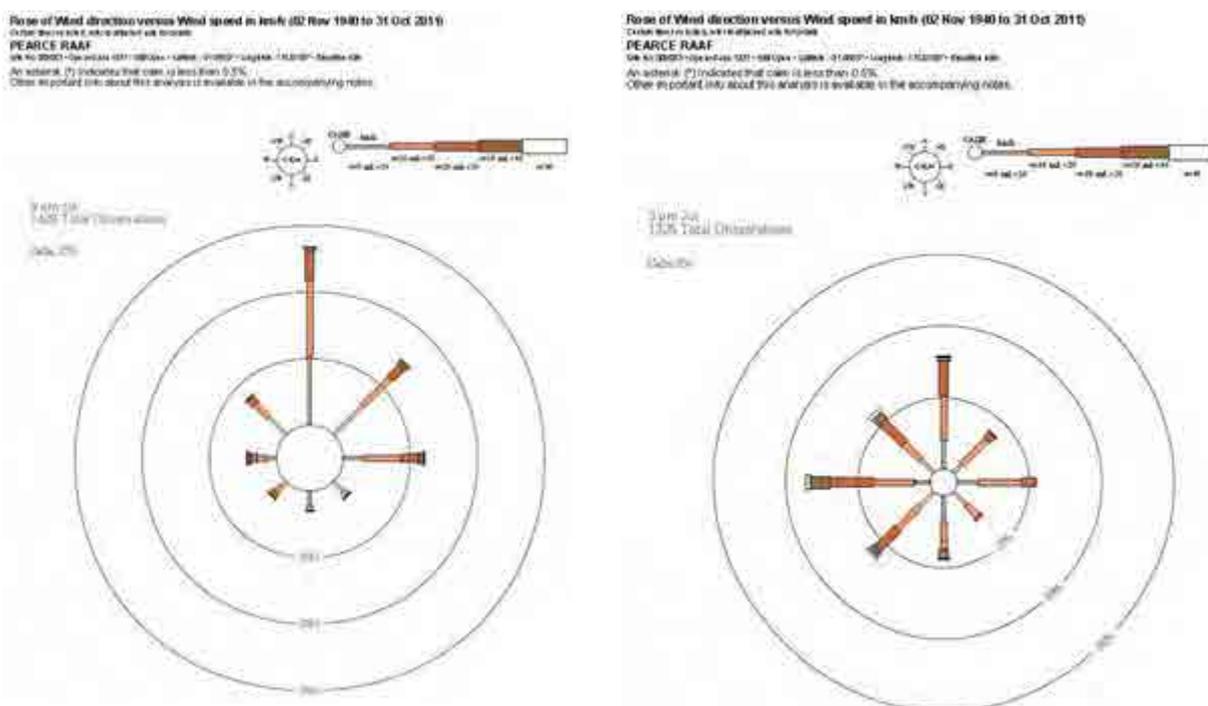
Winds are mainly easterly but varied in the warmer months by reliable afternoon sea breezes from the south west and in the cooler months by the westerlies that are associated with the bulk of the annual rainfall. Despite the occurrence of strong winds or gales, average wind speeds in winter are considerably lighter than in summer. Please refer to Figure 4 and 5 below.

Figure 4 – Summer (Jan) wind rose 9am & 3pm BoM Pearce RAAF Stn



(BoM, 2015)

Figure 5– Winter (July) wind rose 9am & 3pm BoM Pearce RAAF Stn



(BoM, 2015)

4.3. Prevalent Fire Weather

Fire weather is characterised by mid-level disturbances across the south west of Western Australia, bringing unstable atmospheric conditions (thunder and lightning) from the north or north-west wind directions. This is characteristic of “Extreme” Fire Weather conditions to the area with hot dry conditions prior to storm events. Risk of lightning strikes, spark ignition, arson and other causes of fire give rise to wild fires under these conditions.

Prevalent winds which most wildfire events occur in the region are from the north-west, east and north-east direction. Conditions tend to be dry with low relative humidity. High winds and excess fuels can lead to hazardous conditions for residents. Strong easterly and south westerly winds exist at the subject site during dry summer periods (Figure 4). These circumstances place residential housing under the most risk from bushfire events.

4.3.1. Climate Change

Climate change is expected to impact on the future rainfall pattern of the area. It is recognised that the average rainfall has already declined by 20%-30% over the past few decades and that the long term impact of climate change may lead to a shift in rainfall, as well as dryer climatic conditions for the region. The long term changes are predicted to impact on the flora, fauna and water availability for the region. (Climate Commission 2010)

The Climate Commission (Climate Commission 2010) estimates that

“...Rainfall patterns in Western Australia have changed over the last 40 years. There is significant evidence that climate change has contributed to the marked drying trend in the southwest of the state.”

The construction of the proposed development is not predicted to be affected by sea-level rise, however could be affected from increased intensity rainfall events or extended drying periods. Increased extreme weather from climate change could affect fire frequency and behaviour in Western Australia (DEC, 2012), this BMP has been prepared to reduce the risk of bushfire on the proposed residential dwelling of the property.

4.4. Topography

The subject site is located in an undulating landscape on the Dandaragan Plateau with the average “Effective Slope” (as per AS3959-2009) slope for the site as 1.7 ° (assessed as an average over 5 slopes/100m) calculated to be < 5° and ranges between 1° and 3°. One metre contours indicate there are 2 hills in the western portion up to 201m AHD and one dominant ridge in the south east of the subject site upto 208m AHD. The lowest elevation of the site is in the east along the formation of a creek (upper catchment) at 168m AHD.

4.5. Bushfire fuels – Vegetation

The subject lies within the Swan IBRA bioregion. This bioregion is comprised of “*low lying coastal plain, mainly covered with woodlands. It is dominated by Banksia or Tuart on sandy soils.*” The area is located within the SWA1- Dandaragan Plateau. *The plateau is bordered by Derby and Dandaragan Faults. Cretaceous marine sediments are mantled by sands and laterites. Characterised by Banksia low woodland, Jarrah - Marri woodland, Marri woodland, and by scrub-heaths on laterite pavement and on gravelly sandplains.* (Hearn et al., 2002).

Detailed vegetation inventory was undertaken in the vegetation types identified on site (Bio Diverse Solutions, 2012). A total of 149 species was identified within 3 vegetation types. The vegetation types are shown over the page in Table 1 as described in 2012.

Table 1 – Vegetation Types Identified on site (from Flora and Vegetation survey 2012)

Vegetation Unit	Planning for Bushfire Protection (2010) Vegetation Type	Site Description	Unit	Photograph
Medium woodland; jarrah-marri (EmCc)	Type B - Woodland	Medium woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i>		
Mosaic Medium open woodland: jarrah, marri & banksias (EmCcBa),	Type B - Woodland	Medium open woodland: Jarrah & Marri, with low woodland Banksia/sparse woodland jarrah/marri		
Cleared paddock areas	Type G - Grassland	Open paddocks, cleared of native vegetation, occasional paddock trees Jarrah & Marri,		

(Bio Diverse Solutions, 2012)

The eastern portion of the subject area (in 2012) was predominantly pasture with little to no paddock trees. In 2016 site assessment revealed the eastern paddocks were continued to be grazed and managed in a low fuel state. The western area of the subject site was assessed in 2012 as being “grassland”, in 2016 it was noted this area has not been grazed in some time and is now predominantly classified as Woodland Type B, where the grasses are exceeding 200-.300mm, trees are exceeding 10% coverage and there is regrowth of scrubs and shrubs.

Internal to the site remnant patches of Jarrah/Marri Woodland occurs, which in 2012 (site first assessed) was generally lacking in midstorey and understorey species due to grazing of stock. In 2016 site assessment has again classified this as Woodland Type B, however the stock grazing has discontinued and this area is now more extensive across the internal site in eastern areas.

External to the site there is forest Type A (north, west and east). These areas are typically Jarrah, Casuarina and Marri mix with Banksia and shrub understoreys.

These vegetation types in 2016 are classified as per AS3959-2009 (Table 2.3) criteria as:

- **Forest (Type A)** – *Trees 10-30m high: 30-70% foliage cover (may include understorey of sclerophyllous low trees and tall scrubs or grass). Typically dominated by eucalypts.* Jarrah, Marri and Casuarina multilayered forests to the north, west and east external to the site.
- **Woodland (Type B)** – *Trees 10 -30 m in high; 10-30% foliage cover dominated by Eucalypts; understorey low trees to tall shrubs dominated by Acacia, Callitris or Casuarinas* (WAPC 2010); Jarrah/marri woodland and Mosaic Jarrah & Marri, with low woodland Banksia/sparse woodland Jarrah/Marri located adjacent and internal to the Subject Site in western areas – ungrazed for some time.
- **Scrub (Type D)** – *Shrubs greater than 2m high; 10-30% foliage cover with a mixed species composition.* Banksia scrub to the east of the subject site (external).
- **Grassland (Type G)** – *Open paddock areas, overstorey foliage <10%.* (WAPC 2010), open paddock areas located internal and adjacent to the Subject Site.

Please refer to Table 2 below showing vegetation types classified in March 2016 as per above and shown in Vegetation Classes Map Appendix C.

Table 2 – Vegetation Classifications AS3959 -2009 Tea Tree Road

Plot 1	Classification or Exclusion Clause	Forest Type A
		Jarrah/Marri low forest Multi-layered vegetation (fuels), grasses/sedges understorey, shrubs 1-3m midstorey Canopy >30% coverage Trees 10-12m High (30-70% vegetative/foilage cover). Fuel loading 25T/ha -35T/ha
<p><i>Photo ID: Photo 1 view of Forest Type A located north of Tea Tree Road in private property. View from Tea Tree Road from the south to north.</i></p>		
Plot 1 cont	Classification or Exclusion Clause	Forest Type A
		Casuarina/Jarrah/Marri low forest Multi-layered vegetation (fuels), grasses/sedges understorey, shrubs 1-3m midstorey Canopy >30% coverage Trees 10-12m High (>30-70% vegetative/foilage cover). Fuel loading 25T/ha -35T/ha
<p><i>Photo ID: Photo 2 view of Forest Type A located east of subject site in private property. View from eastern boundary from west to east.</i></p>		

Plot 1 cont	Classification or Exclusion Clause	Forest Type A
		<p>Casuarina/Jarrah/Marri low forest Multi-layered vegetation (fuels), grasses/sedges understorey, shrubs 1-3m midstorey Canopy >30% coverage Trees 10-12m High (>30-70% vegetative/foilage cover). Fuel loading 25T/ha -35T/ha</p>

Photo ID: Photo 3 view of Forest Type A located north of the subject site in private property. View from Tea Tree road from south to north.

Plot 2	Classification or Exclusion Clause	Woodland Type B
		<p>Jarrah/Marri Woodland Single -layered vegetation (fuels), grasses/sedges understorey Canopy <30% coverage Trees 8-10m High (<30% vegetative cover). Fuel loading less than 15T/ha</p>

Photo ID: Photo 4 view of Woodland Type B to the east (internal) of the site view from Brennan road from the west to the east.

Plot 2 cont	Woodland Type B	Classification or Exclusion Clause	Woodland Type B
			<p>Jarrah/Marri Woodland Single -layered vegetation (fuels), grasses/low sedges and Grass trees understorey (<1m) Canopy <30% coverage Trees 8-10m High (<30% vegetative cover). Fuel loading 15T/ha</p>

Photo ID: Photo 5 view of Woodland Type B to the east (internal) of the site. View from Brennan Road from the west to the east.

<p>Plot 3</p>	<p>Classification or Exclusion Clause</p>		<p>Scrub Type D</p>
			<p>Banksia Woodland Trees and shrubs 2-10m high 10-30% foliage cover Canopy <30% coverage Small shrubs understorey (<30% vegetative cover). Fuel loading less than 15-25T/ha</p>
<p><i>Photo ID: Photo 6 view of Woodland Type B to the west of the site adjacent to Brennan Road. View from east to west.</i></p>			
<p>Plot 4</p>	<p>Grassland Type G</p>	<p>Classification or Exclusion Clause</p>	<p>Grassland Type G</p>
			<p>Grasses grazed by sheep <100mm high Occasional trees (<10%)</p>
<p><i>Photo ID: Photo 7 view of Grassland Type G internal to the site (central areas), view from Tea Tree Road to the south.</i></p>			
<p>Plot 4 cont</p>	<p>Classification or Exclusion Clause</p>		<p>Grassland Type G</p>
			<p>Grasses grazed by sheep <100mm high Little to no trees</p>
<p><i>Photo ID: Photo 8 view of Grassland Type G internal to the site (eastern areas), view from tea Tree Road from the north west to south east</i></p>			

4.6. Assets

The subject site is predominantly cleared of remnant vegetation, with some isolated remnant vegetation patches which have been grazed. The site is valued for its proximity to the Bindoon townsite and Perth city, remnant vegetation and sandy soils (where perennial horticulture i.e. vineyards are being established).

Once developed, the values which will be potentially affected by fire include:

- **Human lives:** It is likely that more than 110 people could be resident at the newly created subdivision;
- **Assets:** The development will contain dwellings and valuable infrastructure; and
- **Environmental Conservation Values:** the site has internal remnant (forest) vegetation areas in western portions of the site which have vegetation conservation values.

4.7. Access

Vehicle access to the subject site is from Tree Road and Brennan Road in the west. An internal informal 4 x 4 track services paddocks and water supplies for grazing stock. Please refer to Photo 9 and 10 below



Photo 9 – View of Tea Tree Road to the north of the subject site



Photo 10 – View of Brennan Road to the west of the subject site

4.8. Water Supply

There is presently no developed land within the subject site. Water is presently gained from a dam in the east and pumped via windmill across the property. Please refer to Photograph 11.



Photo 11 – View of dam in Lot 1 Tea Tree Road.

4.9. Firebreaks

There are existing firebreaks to SoC required standards around the property, refer to Photo 12.



Photo 12 – View of existing firebreaks along perimeter of property.

5. Potential Fire Issues and Fire Risk

The bushfire hazard assessment provides a measure of the fire intensity and likelihood of bushfire attack measures on a dwelling, subdivision or residential area (Planning for Bushfire Protection, Edition 2 2010). This measure can provide an assessment of the land for suitability for residential construction and takes into account:

1. Vegetation Assessment – type and class in each direction;
2. Distance - between the predominant vegetation class and proposed building;
3. Topography and slope – with reference to accessibility; and
4. Land use – surrounding and internal to the proposal.

(Planning for Bushfire Protection, Edition 2, 2010)

The Vegetation type for the subject site (within 100m) has been classified as per AS3959-2009 as Forest Type A, Woodland Type B, Scrub Type D and Grassland Type G (as per vegetation classifications outlined in AS3959-2009, Table 2.3). The bushfire hazard Level (BHL) ratings have been assessed as per the methodology as outlined in the Guidelines for Planning in Bushfire Prone Areas (WAPC 2015a). Please refer to Table 3 below.

Table 3 – Bushfire Hazard Level (BHL) Categories

Table 3: Hazard levels and characteristics

HAZARD LEVEL	CHARACTERISTICS
Low	<ul style="list-style-type: none"> • devoid of standing vegetation (less than 0.25ha cumulative area); • areas which, due to climatic conditions or vegetation (e.g. rainforests), do not experience bushfires; • inner urban or suburban areas with maintained gardens and very limited standing vegetation (less than 0.25ha cumulative area); • low threat vegetation, including grassland managed in a minimal fuel condition (i.e. to a nominal height of 100mm), maintained lawns, vineyard and orchards; and • pasture or cropping areas with very limited standing vegetation that is shrubland, woodland or forest with an effective up slope*, on flat land or an effective down slope* of less than 10 degrees, for a distance greater than 100 metres;
Moderate	<ul style="list-style-type: none"> • areas containing pasture or cropping with an effective down slope* in excess of 10 degrees for a distance greater than 100 metres; • unmanaged grasslands; • open woodlands; • open shrublands; • low shrubs on areas with an effective up slope*, on flat land or an effective down slope* of less than 10 degrees, for a distance greater than 100 metres or flat land; • suburban areas with some tree cover; and • forest and woodlands with a permanent grass understorey or at most, a scrub understorey structure consisting of multiple areas of <0.25ha and not within 20 metres of each other or single areas of <1ha and not within 100 metres of other scrub areas.
Extreme	<ul style="list-style-type: none"> • forests with a scrub understorey which is multi-tiered; • woodlands with a scrub understorey which is multi-tiered; • tall shrubs; and • any area of vegetation not otherwise categorised as low or moderate.

(WAPC, 2015a)

Internal Bushfire Hazard Levels (BHL)

The subject site has sustained vegetation clearing and grazing by sheep. In eastern areas of the site it is predominantly a cleared landscape representing a **“Low”** BHL as defined by Table 3 (WAPC, 2015a). In the western portions of the site the previously grazed areas has regenerated and now forms a Woodland Type B landscape which is a Moderate BHL (Open Woodlands). The Woodlands in the south west of the property are regenerating (still degraded from previous grazing) and are classified as a **“Moderate”** BHL as defined by Table 3 (WAPC, 2015).

There are low effective slopes for the site, with all slopes <5°. Refer to Bushfire Hazard Level Mapping, Appendix D.

External Bushfire Hazard Level (BHL)

Surrounding the subject site to the west, north and east west there is remnant bushland with cleared paddocks to the south. The predominant fire risk associated with the site is the adjacent Forests to the north, west and east which is an “**Extreme**” BHL as defined by Table 3 (WAPC, 2016). The external Woodland and Scrub vegetation are classified as a “**Moderate**” BHL as defined by Table 3 (WAPC, 2015).

Bushfire risk increases with slope, which with hot conditions can give rise to hot and intense fires in north (Summer mid-level disturbances) and easterly (prevailing summer) wind conditions. Slopes are generally low being <5° within 100m of the subject site.

The predominant extreme fire weather in summer conditions can give rise to flame and ember attack from north and north west wind directions (mid level disturbances) and from the east and south west (summer prevailing winds, see Figure 4).

Refer to Bushfire Hazard Level Mapping, Appendix D.

Proposed Subdivision Fire Risk Rating

The fire risk for this subdivision has been rated at **Extreme - Moderate BHL** as defined by Table 3 (WAPC, 2015).

Setback distances of over 100m from native vegetation (Bushfire Prone Vegetation) cannot be achieved for all the lots. Where 100m cannot be achieved from dwellings to Bushfire Prone Vegetation, the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015) states that Building to Bushfire Attack Levels (BAL) and AS3959-2009 can apply to dwellings to assist in achieving “Acceptable Solutions” to the subdivision. Where a building is located within the State Gazetted Bushfire Prone Area Mapping (OBRM, 2015), the *Planning and Development (Local Planning Schemes) Amendment Regulations 2015* states that building to Bushfire Attack Levels (BAL) and AS3959-2009 is to apply to dwellings.

The subdivision (and proposed dwellings) will be located within 100m of Bushfire Prone vegetation and is located within the WA State Bushfire Prone Area (OBRM, 2015) mapping. The proposal will require assessment to the bushfire protection criteria as per the newly released “Guidelines for Planning in Bushfire Prone Areas” (WAPC, 2015a). These are outlined in Section 6 –**Assessment to Bushfire Protection Criteria**.

6. Bushfire Management/Mitigation Plan

The Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015a) outlines bushfire protection criteria which subdivisions and development proposals are assessed for compliance. The bushfire protection criteria (Appendix 4, WAPC, 2015) are a performance based criteria utilised to assess bushfire risk management measures and they outline four elements, being:

- Element 1: Location
- Element 2: Siting and Design of Development
- Element 3: Vehicle Access; and ‘
- Element 4: Water

(WAPC, 2015)

The plan of subdivision for Lot 1 and 2 Tea Tree Road Chittering is required to meet the “Performance Principles” and/or “Acceptable Solutions” of each Element of the bushfire mitigation measures (WAPC, 2015). The site has been classified as having a “**Low- Moderate**” future internal bushfire hazard in the development/building areas, with adjacent “**Extreme**” and “**Moderate**” bushfire hazards (as per WAPC Guidelines, Table 3) due to the presence of Forest Type A, Woodland Type B, Scrub Type D and Grassland Type G. Effective Slopes under vegetation are variable across the site are low <5°.

The subdivision will be assessed against the bushfire protection criteria Acceptable Solutions for Elements A1, A2, A3 and A4. The following sections of this report outlines how the subdivision complies with the bushfire protection criteria Acceptable Solutions as per the newly released Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015a).

6.1. Element 1: Location-

Intent: To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.

Assessment to the Acceptable Solutions.

Acceptable Solution applied A1.1: *the strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low Bushfire hazard level, or BAL-29.*

The subdivision can associated new dwellings can be located on BAL Low areas. The previously cleared areas (now regrowing from cessation in farm activities) can be slashed, mowed and maintained in a Low Fuel State (as per AS3959-2009 Clauses 2.2.3.2 (f)). The subdivision has a **Moderate- Extreme** rating due to the presence of remnant external Forest, Scrub and woodland areas (north, south and west). The bushfire hazard level is manageable and adequate setbacks can be achieved to 100m from these areas due to the large lots proposed. The large size lots (Rural Small Holding zoning) ranging from 5.01ha to 5.44ha allow for setbacks to bushfire hazards, therefore reducing the risk or bushfire to people, property and infrastructure. If dwellings do not located >100m from classifiable vegetation then building to AS3959-2009 will apply.

Subdivision is deemed to meet Acceptable Solution A1.1.

6.1.1. Recommendations arising from assessment to this element

The recommendations/conclusions from assessment to Element 1: Location concludes that the subdivision:

- Subdivision is deemed compliant to A1.1 due to :
 - BAL Allocation can apply of BAL-Low through re-clearing previously cleared areas.
 - If vegetation continues to re-grow without maintenance then BAL and building to AS3959-2009 will apply where 100m setbacks cannot be achieved.

6.2. Element 2: Siting and design of development

Intent: To ensure that the siting of development minimises the level of bushfire impact.

Assessment to the Acceptable Solutions – To achieve compliance with this Element using an Acceptable Solution, either or both acceptable solutions (A2.1 and A2.2) must be met that it satisfies Element 1.

The Acceptable Solutions which will be applied to this subdivision include:

- **A2.1: Asset Protection Zone (APZ):** Every building is surrounded by a 20m APZ (see Section 6.2.2).
- **A2.2 Hazard Separation:** Building to AS3959-2009 where setbacks of 100m cannot be achieved to Bushfire Prone Vegetation (see Section 6.2.1).

The subdivision will be assessed to the Acceptable Solutions for Element 2 as demonstrated in the following sections.

6.2.1. Asset Protection Zones (APZ) (Acceptable Solution A2.1)

Acceptable Solutions applied

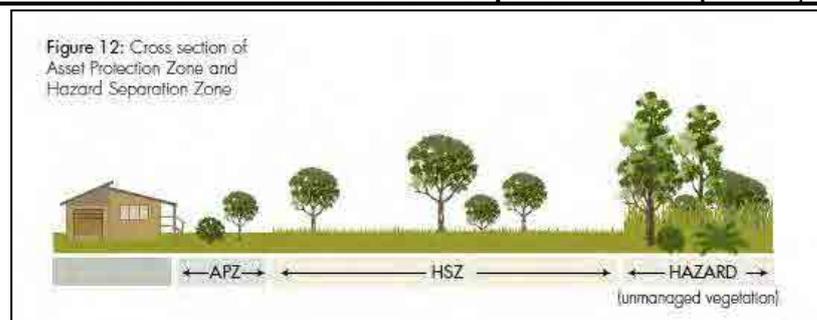
The aim of the Asset Protection Zone (APZ) is a low fuel area immediately surrounding a habitable building, and is designed to minimise the likelihood of flame contact with buildings (WAPC, 2015). APZ will minimise the risk of the building igniting, (thus protecting the occupants), and with the reduced fuel quantities, allow safer and more effective conditions for fire-fighters to contain wildfires. Roads, pathways, lawns, and other low hazard items should be placed within this zone to improve the effectiveness of the zone. The APZ are required in addition to HSZ (see Section 6.2.2).

Every building must be surrounded by a 20 metre wide APZ, this is deemed by WAPC (2015) as the minimum width to be constructed around all buildings as a “defendable zone”. Activity within the APZ (WAPC, 2015) for each individual dwelling must meet the following requirements:

- a) Width: 20 metres measured from any external wall of the building or building envelope;
- b) Location: within the boundaries of the lot on which the building is situated;
- c) Fine fuel load: reduced to and maintained at 2 tonnes per hectare;
- d) Trees (crowns) are a minimum of 10 metres apart
- e) Trees are low pruned at least to a height of 2 metres;
- f) No tall shrub or tree is located within 2 metres of a building;
- g) No tree crowns overhang the building;
- h) Fences and sheds within the APZ are constructed using non-combustible materials (e.g. colour bond iron, brick, limestone, metal post and wire); and
- i) Sheds within the APZ should not contain flammable materials.

An example of APZ from the “Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015) is shown in Figure 6.

Figure 6 – Asset Protection Zone and Hazard Separation Zone (WAPC, 2015)



(WAPC, 2015 a)

All residences within the proposed subdivision can achieve the required 20m APZ within their respective boundaries. Information on long term maintenance of APZ for the homeowner, as recommended by DFES is provided in Appendix F.

6.2.2. Hazard Separation (Acceptable Solution A2.2)

BAL is the process for measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact. The threat or risk of bushfire attack is assessed by an accredited BAL Assessor. BAL rating determinations are of 6 levels BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40, BAL-FZ. Building is generally not recommended in BAL-40 or BAL-FZ areas. The BAL rating is determined by the distance of the building to vegetation, slope and vegetation type adjacent to the dwelling. Refer to Figure 9 below.

Figure 9 - BAL Construction levels in context



(WAPC, 2015a)

Building design and construction to AS3959-2009 is a standard primarily concerned with improving the ability of buildings in designated bushfire prone areas to better withstand attack from bushfire thus giving a measure of protection to the building occupants (until the fire front passes) as well as to the building itself. The construction standards outlined in AS 3959-2009 provide reference to specific items of building and it is recommended that the future lot owner discuss these in detail with their builder or architect. Table 2 outlines some of the construction consideration to AS3959-2009 when building in bushfire prone areas. Construction standards are to be approved by the CoA prior to construction. Building to AS3959-2009 applies to buildings as defined in the Building Code of Australia (BCS).

Table 2 – AS3959-2009 Construction Requirement (Example)

Construction requirement AS3959-2009
Flooring systems
Supporting posts, columns, stumps, piers and
External Walls
Windows
External Doors
Vents and weep holes
Roof
Eaves
Fascia's
Gutters and downpipes
Veranda and decks
Service Pipes (water and gas)

The subdivision will comply to Acceptable Solution A2.2 by applying either a 100m Hazard Separation Zone (HSZ) (i.e. 100m setback) at the interface of the building and the bushfire hazard or a setback associated with BAL construction and AS3959-2009 as outlined in the BAL Contour Map outlined in Appendix E. No higher BAL allocation than BAL 12.5 needs to be applied to the dwellings.

Table 3 – Minimum Setback Distances and Construction Standards

BAL Rating	Vegetation Type	Distance to Vegetation	Construction
BAL 29	Woodland Type B	17-<25m	AS3959-2009 to apply
BAL 19	Woodland Type B	25-<35m	AS3959-2009 to apply
BAL 12.5	Woodland Type B	35-<100m	AS3959-2009 to apply
No BAL Rating Required	All Vegetation	>100 metres	No construction standards required

Vegetation is downslope and >0 to 5 Degrees (as per AS3959-2009).

Notes on BAL Assessment:

- **Sites affected by BAL will be subject to detailed feature survey and the mapping depicted in the BAL Mapping Appendix E is a guide, with accuracy to within 5m.**
- **If dwellings cannot achieve >100m from the adjacent vegetation then BAL Construction will apply as outlined in Table 3.**
- **BAL setback distances are measured from the edge of existing vegetation at time of feature survey and building construction approvals stages.**
- **Detailed assessment for BAL Construction as described in this document can be undertaken at construction stage by an accredited Bushfire Consultant with approval from the Shire of Chittering.**

A 100m HSZ from external Extreme and Moderate BHL can be achieved as shown on the SP Appendix B and the BAL Mapping Appendix E. The lots will require ongoing maintenance from the developer or will be subject to vegetation clearing by the new owners. If the lots remain unmaintained and continue to revegetate dwellings may require to be built to BAL and AS3959-2009 as per Table 3. This is indicated in the BAL Mapping Appendix E (see inset).

The developer will be responsible for the implementation of a notification on title pursuant to 70A of the *Transfer of Land Act 1893* with regard to the notification on title on lots the lots alerting the future owners of the endorsed Bushfire Management Plan

Assumptions made in BAL Contour Mapping:

- Remnant vegetation in internal areas will be maintained as low fuel by the developer.
- A 100m HSZ (setback) will apply to the whole of development and be maintained by the developer prior to sale of lots and until lots are relinquished to new owners.
- The large rural lot to the east will be maintained as rural and grazed pastures.
- The remnant vegetation areas external to the site to the north, south and west adjacent to the subject site will remain “as is”.

6.2.3. Recommendations arising from assessment to this Element

The recommendations/conclusions from assessment to Element 2: Siting and design; concludes that the subdivision:

- The Subdivision is deemed to be compliant with Element 2 by:
 - The application of a 20m APZ;
 - Clearing/maintenance of 100m HSZ (setback) for BAL Low; and

- If woodland Type B areas regenerate and 100m not achieved then building to BAL/AS3959-2009 as it applies to the dwelling;
- The developer will be responsible for the implementation of a notification on title pursuant to Section 70A of the Transfer of Land Act 1893 for all lots affected by an increase in construction standards consistent with a BAL rating/AS3959-2009 allocation to the lot, and alerting the prospective owner (s) of the lots and successors in title of the Bushfire Management Plan.
- It is recommended that the developer clear all the lots prior to sale to ensure the APZ and setbacks are demonstrated to the purchaser at time of sale. The APZ areas are to be as per the standards in Section 6.2.1 and these areas are regularly maintained by the developer until all land is relinquished to the new lot owner.
- Maintain 100m setback from dwellings and bushfire hazards at all times during staged construction and grasses maintained to <100mm at all times;
- The vegetation clearing required for the street verges, APZ and HSZ areas does allow for the retention of significant trees, these should be clearly marked for the developer prior to clearing operations on the site. Final placement of the dwellings on site (by new lot owners) may require further trees to be removed however this stage of tree removal should only be as per the standards of the APZ Section 6.2.1; and

Individual BAL assessments may be considered on the lots by the new owners when dwelling design/placement is known and can be undertaken at building approval stages with the engagement of an Accredited Level 1 BAL Assessor.

6.3. Element 3: Vehicle Access

Intent: To ensure that the vehicular access serving a subdivision/development is available during a bushfire event.

Acceptable Solutions applied.

The internal layout of the Subdivision's public roads and private access allows vehicles and other emergency vehicles to move through the subdivision at all times, meeting the Acceptable Solutions. Vehicle access technical standards as outlined in Table 4 are the minimum requirements from Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015a). Refer to Table 4 and Bushfire Management Plan Appendix G.

Table 4 – Vehicular Access Standards

Standard	Public Roads	Fire Service Access Ways	Emergency Access Ways
Minimum trafficable	6 metres	4 metres	6 metres
Horizontal clearance	6 metres	6 metres	6 metres
Vertical clearance	4 metres	4 metres	4 metres
Maximum grades	1 in 10	1 in 10	1 in 10
Minimum weight capacity	15 tonnes	15 tonnes	15 tonnes
Maximum crossfall	1 in 33	1 in 33	1 in 33
Curves minimum inner	8.5 metres	8.5 metres	8.5 metres
Cul de sacs	N/A	N/A	N/A
Battle Axes	Not more than 600m	N/A	N/A
Private Driveways	Standard as roads if house >50m from road, passing bays every 200m for 20m.	N/A	N/A
Signage	Not required	Required	Must be signposted
Gates	Not required	Min width 3.6	Min width 3.6
Design and construction	Approved by relevant local government	Approved by relevant local government	Approved by relevant local government
Turn around areas	Every 500 metres, within 50 metres of the house and at water	Every 500 metres, within 50 metres of the house.	Not required

(WAPC, 2015a)

6.3.1. Two Access Ways (A.3.1)

The SP design allows for two access points onto Tea Tree Road and an Emergency Access Way and Fire Service Access onto Brennan Road in the west and to southern firebreaks (in adjacent properties) to the south and meet the Acceptable Solution. Please refer to Bushfire Management Plan Appendix G.

6.3.2. Public roads (A.3.2)

All internal public roads shall be constructed to acceptable standards (Refer to Table 4 – Vehicle Access Standards) and shall be detailed in Civil Engineering Designs. The Subdivision design allows for two way traffic and safe egress from the subdivision via a road network with 30m internal road reserves and meets the Acceptable Solution. Please refer to Bushfire Management Plan Appendix G.

6.3.3. Cul de Sacs (A3.3)

Cul-de-sacs will not exceed 200m in length and meet the Acceptable Solution.

6.3.4. Battle Axes (A3.4)

Battle Axes shall not exceed 600m, standards for road/street construction are as per Table 4 – Vehicle Access Standards. All Battle Axes proposed meet this requirement and meet the Acceptable Solution.

6.3.5. Private Driveways (A3.5)

Constructed driveways are to meet the requirements of Table 4. All driveways will be <50m from road to dwelling and will not require turnaround areas or passing pays, therefore meeting the Acceptable Solution.

6.3.6. Emergency Access Ways (A3.6)

Emergency Access Ways (“Fire Access”) will be from the northern side of the subdivision to Tea Tree Road, from Brennan Road to the west and to southern firebreaks (in adjacent properties) to the south. If the subdivision is staged, the Emergency Access Ways will be required to link through to Brennan Road and to Tea Tree Road, this will need to be via a hardened surface as per Table 4 - Vehicular Access Standards. The linking Emergency Access Way to Brennan Road will provide a trafficable surface for emergency access linking Brennan Road and the subdivision internal roads, and meet the Acceptable Solution. Please refer to the Please refer to Bushfire Management Plan Appendix G.

6.3.7. Fire Service Access (A3.7)

Fire Service Access (FSA) is proposed from the northern side of the subdivision to Tea Tree Road, from Brennan Road to the west and to southern firebreaks (in adjacent properties) to the south. These FSA’s to enable fire appliance ease of access through the subdivision for fire fighting operations, please refer to the Bushfire Management Plan- Appendix G. The road reserve through the subdivision enables light unit fire appliance and heavy unit (truck appliances) access in an emergency.

The linking Fire Service Access to Brennan Road will provide a trafficable surface for fire appliance access through the POS corridor (Shire land) linking Brennan Road and the subdivision internal roads. Please refer to the Please refer to Bushfire Management Plan Appendix G.

The minimum running surface and standards of construction roads is as per Planning for Bushfire Protection Edition 2 (2010), please refer to Table 4. Fire Service Access routes for this subdivision will:

- Link the road network;
- Be adequately signposted (see following section);
- Allow for two-way traffic (as per Table 4);
- Have a hardened surface (as per Table 4 standards); and
- Have erosion control measures in place such as culverts, stormwater contours/diversions, and native vegetation remediation/stabilisation at gully crossings.

If the subdivision is staged, the Fire Service Access Ways will be required to link through to Brennan Road, this must be via a hardened surface as per Table 4 - Vehicular Access Standards.

6.3.8. Signage

“Fire Service Access Ways” are to be sign posted where they adjoin public roads. DFES recommend the following wording for signage as appropriate:

- “Fire Service Access – No Public Access”; and
- “Emergency Access Only”.

An example of clear street signage is shown over the page in Photo13.



Photo 13 – Example of street/road signage clearly indicating emergency access/egress within the subdivision.

6.3.9. Gates

The use of gates to restrict public traffic on “Emergency Access Ways” is acceptable provided it is wide enough to accommodate 3.4 Heavy Duty Fire Appliances. Gate standards are to be as follows:

- Minimum width 3.6 metres;
- Approved by the Shire of Chittering;
- Emergency Access must not be locked; and
- Bollards should be installed to restrict vehicle movement around the gates where appropriate.

6.3.10. Individual Fire breaks (A3.8)

Internal fire breaks are required by the Shire of Chittering, refer to the current Fire Break Order (annually updated) from the Shire website:

<http://www.chittering.wa.gov.au/chittering-fire-services/fire-breaks-and-important-dates-to-remember.aspx>

As at 2014/15, the Shire of Chittering Firebreak Order states the following firebreaks would apply to this subdivision:

- **All properties, including Rural Residential with land greater than equal or greater than 2 ha:** Must clear a fire break of all flammable materials three metres (3) metres wide, with a four (4) metre vertical clearance along the inside of the boundary to the property.
- **Land Greater than 120 ha:** Must have a firebreak in such a position which divides the land into areas not exceeding 120 ha. An indication of how this can be achieved on the Rural Lot is shown in the BMP Appendix G.

Individual fire breaks will apply to lots 1-47 (Rural small holdings 5.01 to 5.44ha), with firebreaks for the larger Rural Lot (proposed lot 48) along existing fire breaks as shown in the BMP Appendix G.

The fire breaks are to be maintained to the standard of the Shire of Chittering’s Town Planning Scheme No 6, Local Planning Policy No 21. This policy requires all firebreaks to be as stated above (3m wide with a 4m vertical clearance) for 4 wheel drive access. Where a Fire Access (Emergency Access Way) or road adjoins a property, an individual fire break is not required

Internal lot firebreaks should be designed to minimise soil erosion. For instance, firebreaks will generally avoid areas undergoing environmental remediation (Remnant Vegetation areas or Vegetative Corridors) and be installed around these areas. In areas of steep terrain, firebreaks can be created by spraying with chemicals, the path of a firebreak can be meandered to follow contours to reduce the risk of soil erosion from storm water.

6.4. Element 4 Water

Intent: To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

Acceptable Solution applied

Scheme water will not be provided to the subdivision. The Guidelines for Planning in Bushfire Prone Areas recommends rural small holdings to have the provision of a 50, 000L water tank (to a standard approved by the Shire of Chittering) every 25 residences and a hydrant installed. It is therefore required that a 100,000 L capacity should be applied at this subdivision (48 lots) at a central location. These structures will be located on public land and vested with the Shire of Chittering as subdivision clearance occurs.

The hydrant/water tank construction must meet the following standard specifications and have:

- Hardstand and turnaround area suitable for 3.4 Heavy Duty fire appliance;
- Fire water tanks to have level indicators installed;
- Valves and manifolds must be locked by the developer with a Shire Standard lock;
- AS approved fire hydrants;
- Must be capable of delivering 600 litres per minute via Engineers certification;
- Procedures to be put in place by the developer to ensure the tank is maintained at full capacity at all times;
- Be easily accessible with standard fire services hydrant and key; and
- Be identified by standard road and pole markings.

A recommended location for the tank and hardstand area is shown in the Bushfire Management Plan Appendix G. After the developer has completed all maintenance periods, it shall be the responsibility of the Shire of Chittering to maintain this facility.

As scheme water is not to be provided to individual houses, all buildings intended for residential use must include provision for the storage of water in tanks not less than 120,000 litres capacity, of which 10,000L is to be held in reserve for fire fighting purposes. All water tanks intended to reserve 10,000L for fire fighting purposes are required to install a 50mm male camlock fitting to the floor of the tank and the draw point for the residential purposes is to be 10,000L above the floor of the tank.

6.5. Other Bushfire Mitigation Procedures

6.5.1. Landscaping/Streetscaping Areas

Landscaping and Streetscaping areas subject to similar standards that apply to the APZ and the following minimum standards shall apply:

- Trees (crowns) a minimum of 10m apart (no continuous crowns);
- Trees should have no dead material within the plant's crown or on the bole;
- Fuel reduced to <2t/ha; and
- Shrubs should be no higher than 0.5 m.

6.5.2. Staged Development

If the development is staged it should incorporate the following:

- Reduction of bushfire fuels in HSZ and APZ for each stage of construction of the subdivision and during maintenance periods;
- Maintenance of 100m HSZ to APZ standards – note grasses to be slashed and maintained to <100mm at all times.
- Construction of 2-way Emergency Access Way from Tea Tree Road to Brennan Road;
- Installation of Water Tank on public land (minimum of 50,000L/25 residences); and

- Maintenance of fire protection measures in public areas (gates, access, landscaped areas etc) until the developer has relinquished construction/maintenance responsibility of public use areas to the Shire of Chittering.

6.5.3. Evaporative Air Conditioners

Evaporative air conditioning units can catch fire as a result of embers from bushfire getting into the unit. These embers can then spread quickly through the home causing destruction. It can be difficult for fire-fighters to put out a fire in the roof spaces of homes. Information on Evaporative air conditioners is supplied in Appendix F of this document.

It is also recommended that home owners:

- Ensure that suitable external ember screens are placed on roof top mounted evaporative air conditioners compliant with AS3959-2009 (current and endorsed standards) and that the screens are checked annually.

7. Shire of Chittering Fire Protection Plan

The Shire of Chittering has the assistance of the Chittering Fire Services which is made up of six Volunteer Bush Fire Brigades. It has a Chief Bush Fire Control Officer and two Deputies. Five Brigades are fire fighting units and one is an incident support Brigade. Each fire fighting unit has three appliances suited to its area. The Incident Support Brigade supports the Incident Management Team at all fires when required.

Training and induction courses are held regularly and land owners are encouraged to attend these. For more information refer to their website:

<http://www.chitteringfireservices.org.au/>

Local Bush Fire Control Officers are allocated throughout the Shire depending on region, the latest Fire Break Order should be consulted from the Shire's website for contact details:

www.chittering.wa.gov.au

7.1. Fire Fighting Facilities

The subject area is in the Upper Chittering Bushfire Brigade District. Response times can vary depending on commitments of volunteers, fire events current at time and priority of the fire services in the south west of Western Australia during summer periods. DFES recommend that homeowners take care to prepare their individual dwellings for fire season and take precautions against fire as per the **“Bushfire Preparedness – Prepare. Act. Survive.”**

It is generally acknowledged that during large wildfire events, local resources may not be able to respond to every dwelling due to strategic deployments of services, priorities within the area or state and/or present commitments of volunteers and resources.

The Chittering Fire Services has 3.4 and 2.4 heavy duty tankers (3000L and 2000L) and light tankers (fast attack 400L capacity). These are typical of Brigade units for fire fighting services within Western Australia.

The Chittering Fire Services' six bush fire brigades provide local fire services and have:

- 4 fire stations;
- Volunteer members;
- A communications and call out system;
- Protective clothing issue to volunteers; and
- DFES approved fire appliances.

7.2. Homeowner Protection

It is the responsibility of homeowners to protect their property from fire. DFES have readily available information online which can assist homeowners in their preparedness during fire season (October to May). The DFES website **“Bushfire Preparedness – Prepare. Act. Survive.”** should be accessed by all owners in bushfire prone areas. A hard copy of the A4 book “Prepare. Act. Survive” can be found at local Shire of Chittering Offices or DFES offices, or downloaded off the above web address:

<http://www.dfes.wa.gov.au>

7.3. Bushfire Plan

Residents should prepare their own individual fire plans, as they need to make a commitment to develop a bushfire survival plan detailing preparations and actions to take if a bushfire threatens. When developing a bushfire survival plan, the following should be considered:

- If you plan to leave for a safer place - where will you go and how will you get there? Your safer place could be with friends and family, and may not be far away. Know where you will go and never 'wait and see'. Relocating at the last minute can be deadly
- Does your household include elderly relatives, young children, people with disabilities or illness? When, where and how will they be relocated? Who will care for them?
- What will you do with your pets and livestock?
- Can your home be defended? Is it in a location that makes it difficult or dangerous to actively defend? (refer to DFES's Homeowners Bushfire Survival Manual - PDF)
- Will your home provide shelter if you have to or decide to stay?
- Are you capable of defending your home without the support of fire fighters?
- Do you have the skills, knowledge and capacity to check for and put out spot fires for up to ten hours after the fire front has passed?
- Do you have the right equipment and resources to actively defend? (e.g. sufficient independent water supply of at least 20,000 litres and a petrol, diesel or generator powered pump capable of pumping 400 litres per minute)
- Will you cope with the noise and stress of a bushfire if you decide to actively defend? Being in a bushfire may be the most traumatic experience of your life.

(from DFES website, 2013)

By compiling information as outlined above, the individual lot owner can be prepared for their response in a bushfire emergency. Home owners should not rely on emergency personnel to attend their home and thus it is stressed to **prepare an individual bushfire emergency plan** regarding their intentions and property. This Bushfire Management Plan is **not** an individual bushfire emergency plan.

As noted in Section 6.0, building to AS3959-2009 is a standard primarily concerned with improving the ability of buildings in designated bushfire prone areas to better withstand attack from bushfire thus giving a measure of protection to the building occupants (until the fire front passes) as well as to the building itself.

AS3959-2009 disclaimer: *It should be borne in mind that the measures contained within this Standard (AS3959-2009) cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather condition.*

(AS3959, 2009)

Information is also available on the ABC Radio website to guide homeowners in the event of a fire emergency, such information includes:

Planning for an Emergency Bushfire:

- Survival Kit
- Fire Emergency Services
- Before a Bushfire
- During a Bushfire
- After a Bushfire

Refer to the following links for more information on how to prepare a bushfire plan:

<http://www.abc.net.au/news/emergency/?ref=front-page-slider-v2--emergencies>

It is also recommended that homeowners in bushfire prone areas understand the DFES Bushfire Warning System. A brief outline is shown over the page, however further detail should be sought from DFES website (www.dfes.wa.gov.au) in a bushfire emergency.

Bushfire Warning System

During a bushfire, emergency services will provide as much information as possible through a variety of channels.

Community Alerts

DFES issues Community Alerts for bushfires that threaten lives and property.

The alert level changes to reflect the increasing risk to your life and the decreasing amount of time you have until the fire arrives. DFES issues the following bushfires warnings:

- **Advice**
A fire has started but there is no immediate danger, this is general information to keep you informed and up to date with developments.
- **Watch and Act**
A fire is approaching and conditions are changing, you need to leave or prepare to actively defend to protect you and your family.
- **Emergency Warning**
You are in danger and you need to take immediate action to survive as you will be impacted by fire. An emergency warning may be supported with a siren sound called the Standard Emergency Warning Signal (SEWS).
- **All Clear**
The danger has passed and the fire is under control, but you need to remain vigilant in case the situation changes. It may still not be safe to return home.

(www.dfes.wa.gov.au)



8. Summary

8.1. Overall Fire Threat

Marou Property Development Pty Ltd commissioned Bio Diverse Solutions (Bushfire Consultants) to undertake a fire hazard assessment and prepare a Bushfire Management Plan to guide all future fire management for the proposed subdivision development of Lots 1 and 2 Tea Tree Road, Bindoon. The subdivision proposal is for approximately 47 lots to be created as Rural small holdings zoning (5.01ha to 5.44ha) and large 1 Rural Lot.

The subject site is predominantly cleared paddock areas in the east with some internal remnant vegetation patches with Forest/Woodland vegetation. The majority of the site has have been disturbed from previous land activities (clearing, grazing, agricultural pursuits). In 2016 site reassessment (since 2012) assessed the western paddock areas to be not grazed for some time and regenerating Woodland Type B. Adjacent to the subject site to the south, north and west is Forest Type A, Woodland Type B and Scrub type D in private property areas (as classified by AS3959-2009)

The subdivision has been rated as having an **Extreme - Moderate** Bushfire Hazard Level as defined by WAPC Guidelines, Table 3. The subdivision was assessed against the bushfire protection criteria Acceptable Solutions for Element A1, A2, A3 and A4 found that upon construction, the subdivision will comply with the bushfire protection criteria Acceptable Solutions as per the newly released Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015),

A summary includes:

- Subdivision is deemed to be compliant with “Acceptable Solutions” for Element A1, see Section 6.1;
- Subdivision is deemed compliant with “Acceptable Solutions” for Element A2, see Section 6.2;
- Subdivision is deemed compliant with “Acceptable Solutions” for Vehicles (Element), see Section 6.3; and
- Whole of subdivision compliant with “Acceptable Solutions” for Water (Element), see Section 6.4.

This BMP report provides details of the fire management strategies proposed to be implemented across the site as it is subdivided and developed to ensure adequate protection of life, property and biodiversity assets. To ensure the mitigation measures are implemented responsibilities are outlined in the following sections for the Future Lot Owner, Developer and SoC.

8.2. Future Lot Owners Responsibility

It is recommended the Future Property Owners shall be responsible for the following:

- To take measures to protect their own assets on their property, home owners should not rely on emergency personnel to attend their home and thus it is stressed to **prepare an individual bushfire emergency plan** regarding their intentions and property. This Bushfire Management Plan is **not** an individual bushfire emergency plan;
- Implement this document, Bushfire Management Plan of 1 and 2 Tea Tree Road Bindoon as it applies to their individual property;
- Ensure that APZ's are maintained to a minimum of 20 metres around all buildings (see Appendix F);
- Ensure that 100m setbacks (HSZ's) are maintained from the Woodland (internal) vegetation (bushfire) risks (see Appendix F);
- Ensure that their property is built to BAL/AS3959-2009 Building Standards if 100m setback cannot be achieved within their property from Woodland Type B;
- Provision for the storage of water in tanks not less than 120,000 litres capacity, of which 10,000L is to be held in reserve for fire fighting purposes;

- Ensuring that suitable external ember screens are placed on roof top mounted evaporative air conditioners compliant with AS3959-2009 (current and endorsed standards) and that the screens are checked annually; and
- Each property owner is to be made aware of:
 - Fire Management Plan,
 - A hard copy of the A4 book “Prepare. Act. Survive”,
 - Fire Control Information supplied by the Shire of Chittering; and
- It is the responsibility of the individual property owner to maintain in good order and condition APZ, HSZ and driveway standards. Future modifications other than requirements as set out in this Bushfire Management Plan can only be done with written agreement from the Shire of Chittering.

8.3. Developers Responsibility

Prior to development being given final approval by the Shire of Chittering, the Developer shall be required to carry out works that include the following but in respect to individual stages of development. Subsequent to the issue of final approval, the Developer shall have no further responsibilities to the provision of fire fighting facilities and bushfire management on individual lots that pass from their ownership.

It is recommended that the Property Developer shall be responsible for the following:

- Implement this document, Bushfire Management Plan of Lots 1 and 2 Tea Tree Road Bindoon as it applies to their development;
- Comply with standards as outlined by the Shire of Chittering and WAPC conditions of subdivision;
- Ensure that potential property owners are aware of this Bushfire Management Plan;
- Comply with minimum subdivision construction standards as outlined by this Bushfire Management Plan;
- Maintain fire protection measures in public areas (gates, access, landscaped areas etc) until the Developer has relinquished construction/maintenance responsibility of public use areas to the Shire of Chittering;
- Install a 100,000 L capacity water tank for fire fighting purposes located at a central location of the subdivision;
- Construct Access to the following standards as outlined in Table (4).

Table 4 – Vehicular Access Standards

Standard	Public Roads	Fire Service Access Ways	Emergency Access Ways
Minimum trafficable	6 metres	4 metres	6 metres
Horizontal clearance	6 metres	6 metres	6 metres
Vertical clearance	4 metres	4 metres	4 metres
Maximum grades	1 in 10	1 in 10	1 in 10
Minimum weight capacity	15 tonnes	15 tonnes	15 tonnes
Maximum crossfall	1 in 33	1 in 33	1 in 33
Curves minimum inner	8.5 metres	8.5 metres	8.5 metres
Cul de sacs	N/A	N/A	N/A
Battle Axes	Not more than 600m	N/A	N/A
Private Driveways	Standard as roads if house >50m from road, passing bays every 200m for 20m.	N/A	N/A
Signage	Not required	Required	Must be signposted
Gates	Not required	Min width 3.6	Min width 3.6
Design and construction	Approved by relevant local government	Approved by relevant local government	Approved by relevant local government

Turn around areas	Every 500 metres, within 50 metres of the house and at water tanks	Every 500 metres, within 50 metres of the house.	Not required
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(WAPC, 2015a)

- Install Signage and Gates of Fire Service Access (if required);
- Install signage for Emergency Access Ways (if required);
- Implement a notification on title under Section 70A of the *Transfer of Land Act 1983* notifying future lot owners about the BMP;
- Provide each prospective owner with:
 - Fire Management Plan,
 - A hard copy of the A4 book “*Prepare. Act. Survive*”; and
 - Fire Control Information supplied by the Shire of Chittering (Yearly advice Brochure updated annually).

8.4. Shire of Chittering Responsibility

At approval and endorsement of this Bushfire Management Plan, the Shire of Chittering has statutory control and responsibility to ensure that aspects of the Plan and community fire safety are maintained.

It is recommended the Shire of Chittering be responsible for the following:

- Provide advice on standards and methods to achieve community fire protection to owners/occupiers of land.
- Ensure individual Property Owners maintain in good order and condition Emergency Access/Fire Access Ways building protection zones, hazard reduction zone and driveway standards.
- Maintain district Fire Fighting Facilities.
- Undertake Prescribed Burning (if required) and fuel reduction strategies to ensure a maximum of 8T/ha ground fuels on any internal public remnant vegetation (i.e. Vegetative corridor areas) in accordance with the *Bushfire Act 1954*.
- Ongoing management of any public areas will be the responsibility of the Shire of Chittering after the Developer has relinquished construction/maintenance responsibility.
- Maintain condition and working order of district water supplies and equipment for fire fighting purposes.

9. Checklist for compliance to and Guidelines for Planning in bushfire Prone Areas and State Planning Policy 3.7

9.1. Checklist to Compliance to Guidelines for Planning in Bushfire Prone Areas

The following checklist has been developed by Bio Diverse Solutions in response to the bushfire protection criteria as outlined in the recently released Guidelines for Planning in Bushfire prone Areas.

Checklist for proposal compliance and justification to Guidelines for Planning in Bushfire Prone Areas (2015))			
BDS Project Name	BMP Lot 1 and 2 Tea Tree Road Chittering		
BDS Job Number	WHEL014		
Date	13/6/2016	WAPC#	n/a
Client name	Marou Property Development Pty Ltd	Condition #	n/a
Bushfire Prone Area	Yes	Mapping	Yes See App A
Planning proposal	Rural Subdivision	Lots created	48
1. Bushfire Protection Criteria Acceptable Solutions as defined by Guidelines for Planning for Bushfire Prone Areas (WAPC 2015).			
Element	Compliant to Acceptable Solution– Yes/No	Justification	
Element 1 – Location	Yes	Site will be classified as Extreme and Moderate bushfire hazard upon completion. Buildings built to BAL-Low and AS3959-2009, no higher building than BAL 12.5 required on (large sized lots) rural small holding lots. Subdivision deemed to meet Acceptable Solution.	
Element 2 - Siting and design of development	Yes Stages Stag	A2.1: APZ can be achieved within the lot boundaries due to large lots created Subdivision deemed to meet Acceptable Solution A2.2 Setbacks can be achieved and building no higher than BAL 12.5. Setbacks to BAL located within the lot boundary. Building to BAL –Low can occur on all lots. Subdivision deemed to meet Acceptable Solution	
Element 3 - Vehicular access	Yes	A3.1: Two access routes south to north and to west to Brennan Road A3.2 Public roads to meet minimum grades A3.3 Cul-de-sacs meet minimum grades A3.4 Battle axes meet minimum grades A3.5 Private Driveways meet minimum grades A3.6 EAW proposed and can meet minimum requirements. A3.7 FSA along public road network and EAW's. A3.8 Firebreaks/low fuel areas compliant to SoC requirements Meets Acceptable Solution.	
Element 4 – Water	Yes	Reticulated scheme water proposed. Meets Acceptable Solution.	
Bushfire Hazard Assessment required	Yes	See Section 5 and Appendix D of BMP.	
BAL Contour required	Yes	See Section 6 and Appendix E of BMP.	
BMP required	Yes	This BMP document assessed the proposal in detail to the bushfire protection criteria.	

9.2. Checklist to Compliance to SPP3.7 Policy Measures

The following checklist has been developed by Bio Diverse Solutions in response to the Policy measures as outlined in the recently released State Planning Policy 3.7

2. Policy measures SPP3.7		
Policy Measure	Applicable – Yes/No	Justification
6.1 - Higher order strategic planning documents in bushfire prone areas	No	Not applicable – not a high order planning document
6.2 – Strategic planning proposals, subdivision and development applications:	Yes	a) Subdivision proposal within a designated bushfire prone area, BAL and AS3959-2009 to apply where <100m of bushfire prone vegetation. BHL Extreme and Moderate adjacent to site, internal Moderate and Low BHL at completion of construction. No higher BAL construction than BAL Low or BAL 12.5 required. Large lots proposed.
6.3 - Information to accompany strategic planning proposals:	Yes	a) Results of BHL documented in BMP and prepared by an accredited Level 1 BAL Assessor and Experienced Level 2/3 Bushfire Planning Practitioner. b) BAL Contour Map documented in BMP and prepared by an accredited Level 1 BAL Assessor and Experienced Level 2/3 Bushfire Planning Practitioner. c) Assessment to guidelines indicated can meet all Elements assessed against Acceptable Solutions updated BMP would be required to document any changes for future planning stages.
6.4 - Information to accompany subdivision application	Yes	a) BAL Contour map provided and prepared by an Accredited Level 1 BAL Assessor and Experienced Level 2/3 Bushfire Planning Practitioner b) Bushfire hazard issues identified arising from BAL Contour Map buildings. Subdivision can be built to no higher allocation than BAL 12.5. c) Assessment to guidelines indicated can meet all Elements assessed against Acceptable Solutions. Update of BMP required to document any changes for future stages
6.5 Information to accompany Development applications	No	Not applicable – not a Development Application
6.6 Vulnerable or high-risk land uses	No	Not applicable – not a Vulnerable or high-risk land use.
6.7 Strategic Planning proposals, subdivision or development applications in areas where an extreme BHL and/or BAL-40 or BAL –FZ applies	No	No.
6.8 Advice of State/relevant authorities for emergency services sought	No	
6.9 Advice of State/relevant agencies/authorities	No	Flora and Fauna survey completed in 2012, vegetation cleared and degraded condition.

for environmental protection to be sought		
6.10 Bushfire conditions may be imposed	Yes	Building to BAL if dwelling situated within 100m of Bushfire Prone Vegetation.
6.11 Precautionary principle	No	Not applied

9.3. Recommendations/conclusions based on above checklists

A summary of the recommendations within this report is supplied below. This also forms the “upfront” and “ongoing” tasks which need to be completed for this project.

- Implementation of responsibilities of the developer (Section 8.3) will be undertaken by the developer/client via formal endorsement/release of this BMP plan. Agreeance to the responsibilities as outlined in Section 8.3 of this BMP is accepted by the developer/client by the provision of this document to approving agencies.
- Implementation of the responsibilities of the developer (Section 8.3) will not occur by the developer until a formal written approval/endorsement is given from the approving agency regarding the BMP.
- In the event the property passes ownership to a subsequent developer/owner the implementation of the endorsed/approved BMP (Section 8.3) should be conditioned by WAPC as a matter of the WAPC subdivision conditional process.
- The developer will be responsible for the implementation of a notification on title pursuant to Section 70A of the Transfer of Land Act 1893 for all lots affected by an increase in construction standards consistent with a BAL rating/AS3959-2009 allocation to the lot, and alerting owner (s) of the lots and successors in title of the Bushfire Management Plan.
- The BAL Contour Plan (Appendix E) is prepared at a point in time and it is recognised by Bio Diverse Solutions that the landscape may change post subdivision construction and over time. It is therefore recommended that a review of the BAL Contour Plan is undertaken post construction stages and prior to subdivision clearance stages; and/or the map is over 3 years from date of production and, if required, an updated BAL Contour Plan is provided to the CoA prior to conditional clearance of the bushfire management issues.
- Individual BAL assessments may be required on the lots by the new owners and can be considered at building approval stages with the engagement of an Accredited Level 1 BAL assessor.

Based on the above recommendations, Bio Diverse Solutions recommend the proposed subdivision can occur as documented in this BMP Plan. The BMP plan does not give recommendations in regards to detailed environmental (flora, fauna, soil etc) plans, town planning, engineering – civil, structural or building and feature survey requirements, these considerations would need to be addressed through other suitably qualified practitioners.

10. References

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Appendices

Appendix A – Location

Appendix B – Structure Plan

Appendix C - Vegetation Classes Map

Appendix D –Bushfire Hazard Level Mapping

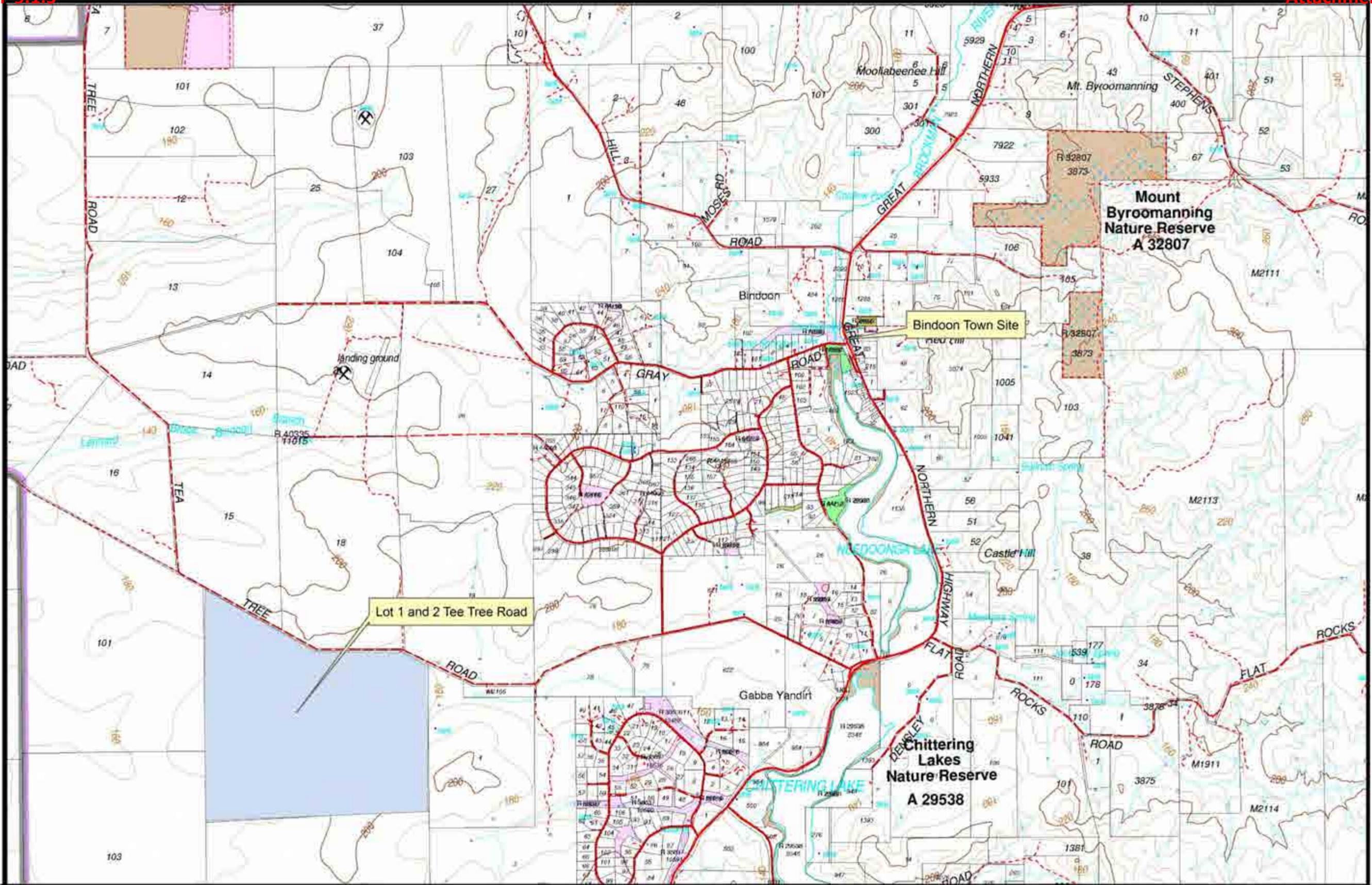
Appendix E – BAL Contour Plan

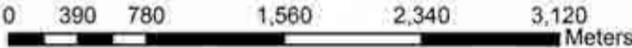
Appendix F – DFES Information for the homeowner

Appendix G – Bushfire Management Plan

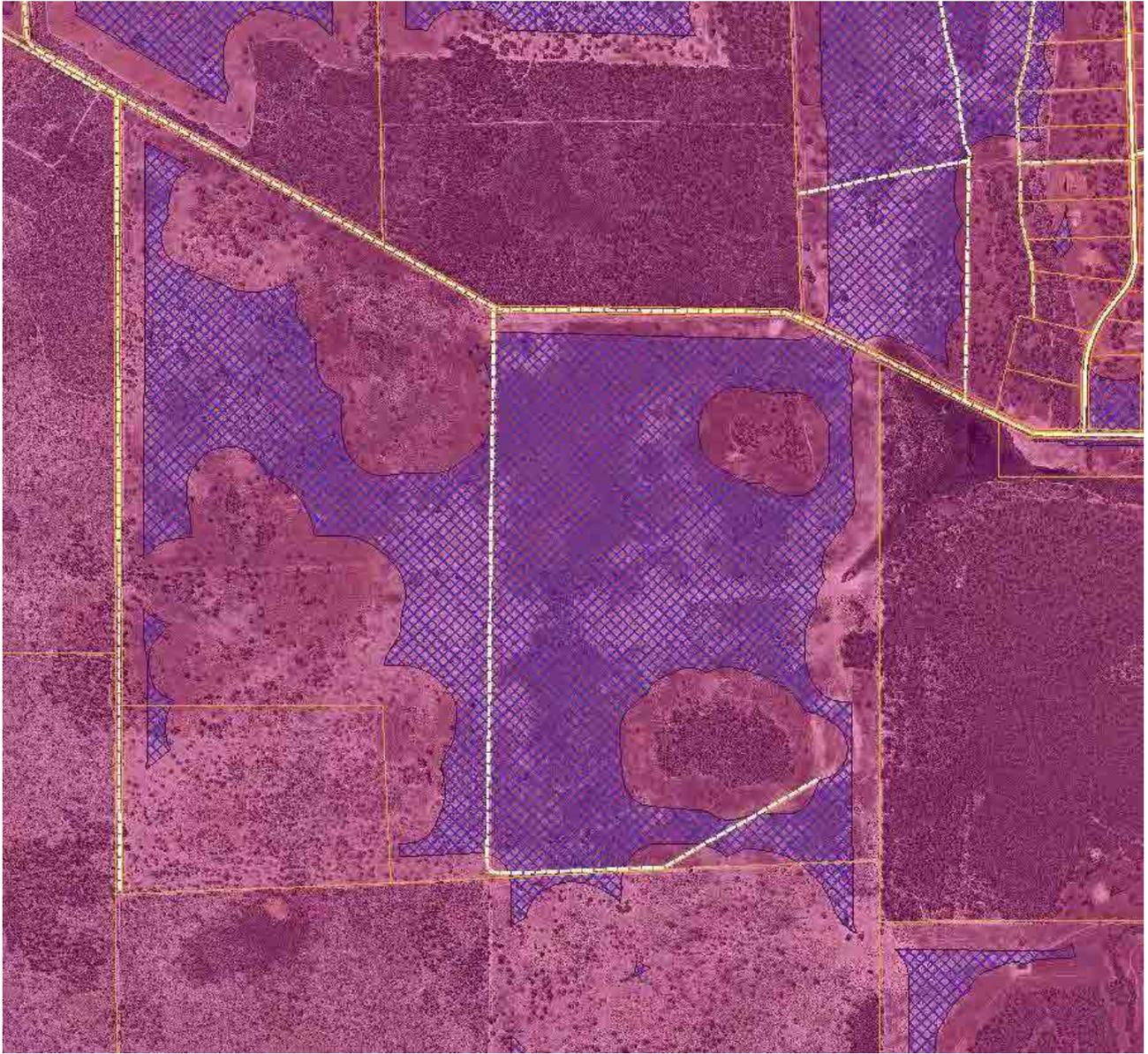
Appendix A

Location Mapping



Legend  Subject area	Scale 1:40000 @ A3  	 BIO DIVERSE SOLUTIONS 65 Peppermint Drive Albany, WA 6330 Australia Tel: 08 9841 3936 Fax: 08 9841 3936 Mob: 0447 555 516	CLIENT Lot 1 and 2 Tee Tree Road Bindoon WA		
			Location Mapping		
			STATUS FINAL	FILE WHEL014	DATE 13/06/2016

OBRM BUSHFIRE PRONE MAPPING 7/12/15 & 20/5/2016



<https://maps.slip.wa.gov.au/landgate/bushfireprone/>

(SLIP 2016)

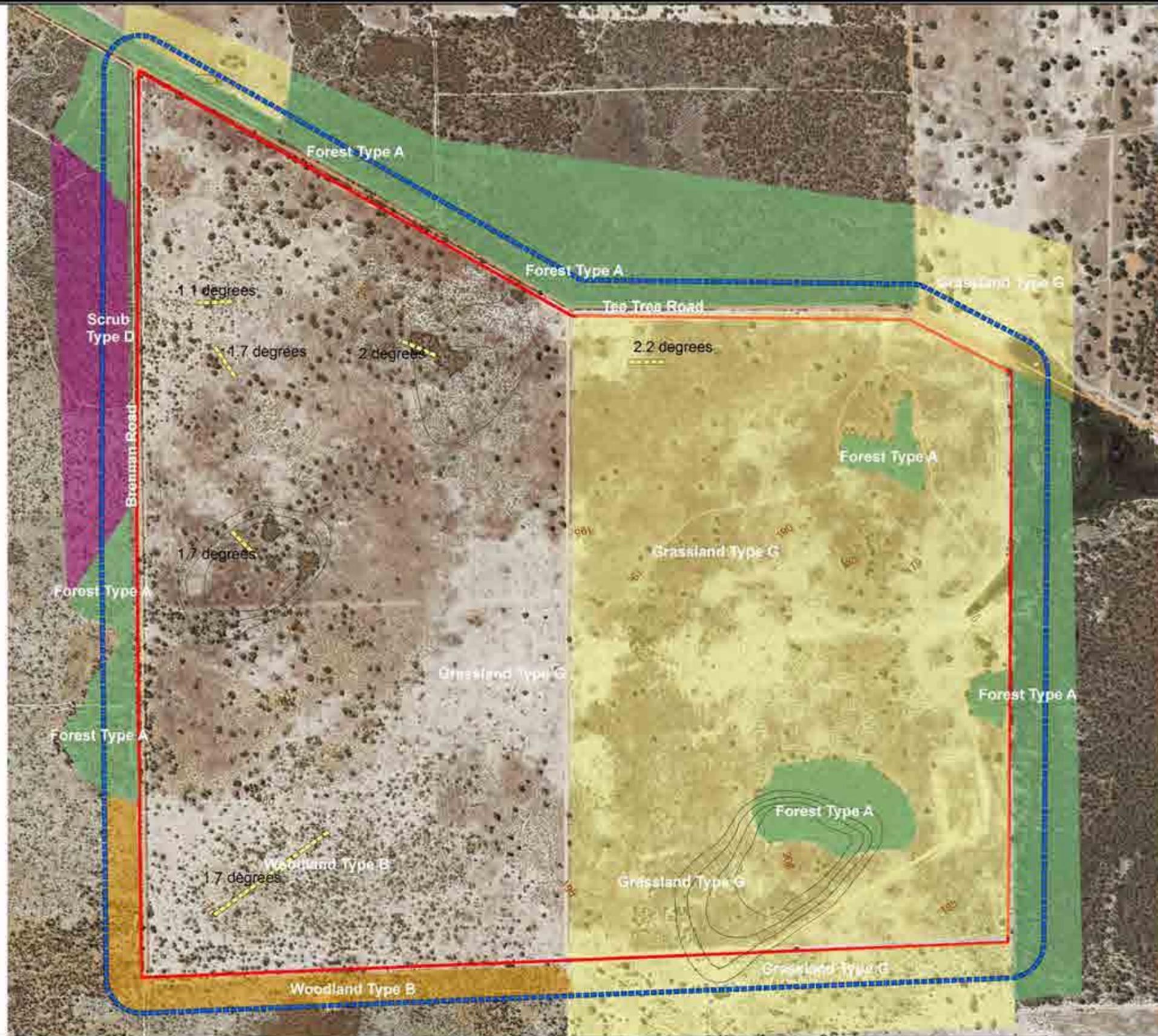
Appendix B

Structure Plan



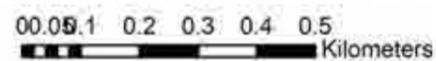
Appendix C

Vegetation Classes Map



Legend

- - - - - 100m Assessment Boundary
- - - - - Slope degrees
- Scrub Type D
- Forest Type A
- Woodland Type B
- Grassland Type G
- Subject area



Scale
1:12000 @ A3



55 Peppermint Drive
Albany, WA 6330
Australia
Tel: 08 9841 3936
Fax: 08 9841 3936
Mob: 0447 555 516

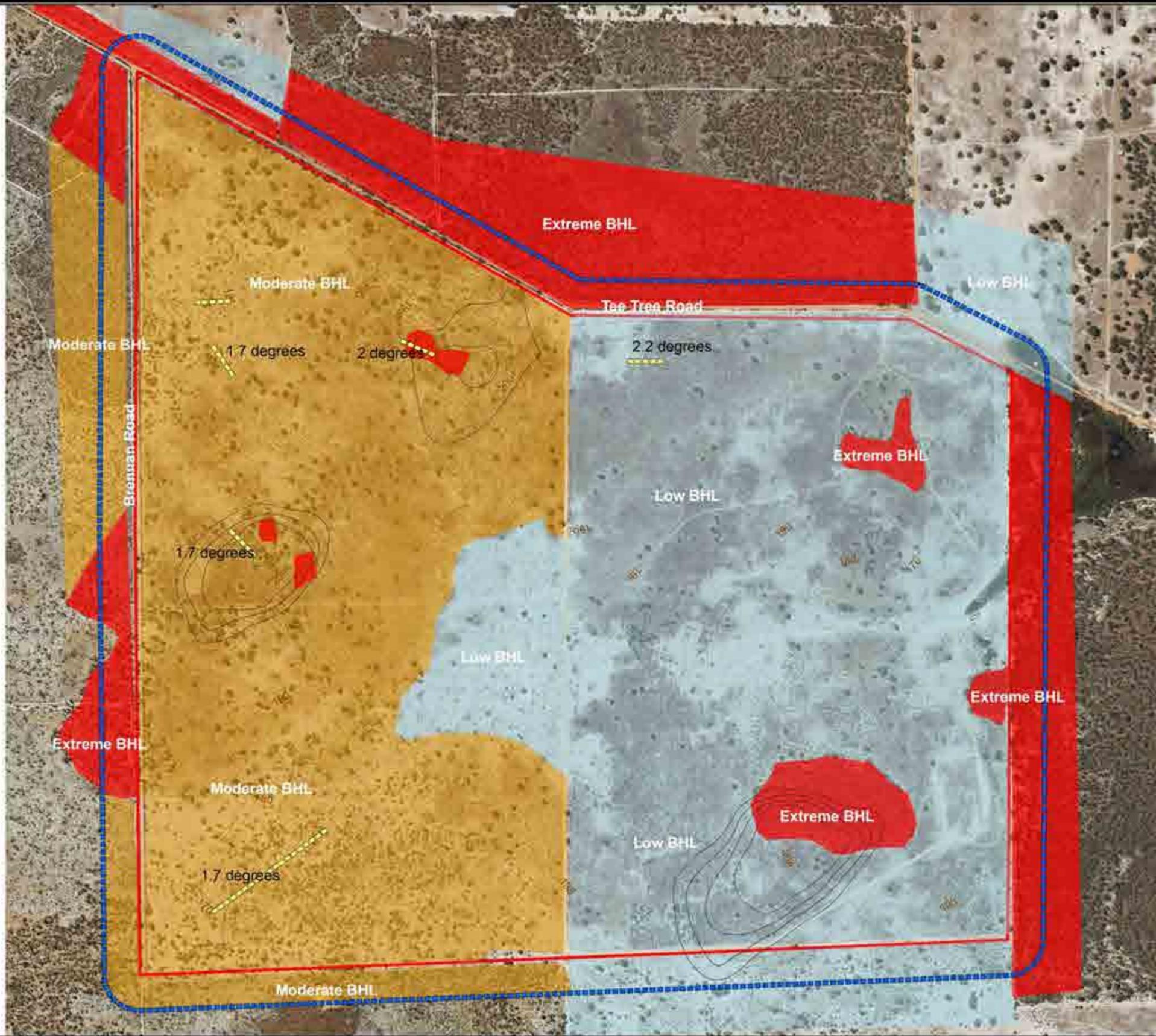
CLIENT Lot 1 and 2 Tee Tree Road
Bindoon WA

Vegetation Classes Map

STATUS	FILE	DATE
FINAL	WHEL014	13/06/2016

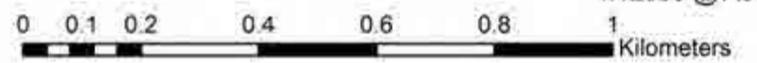
Appendix D

Bushfire Hazard Level (BHL) Mapping



Legend

- - - - - 100m Assessment Boundary
- - - - - Moderate BHL
- - - - - Slope degrees
- - - - - Low BHL
- - - - - Extreme BHL
- - - - - Subject area



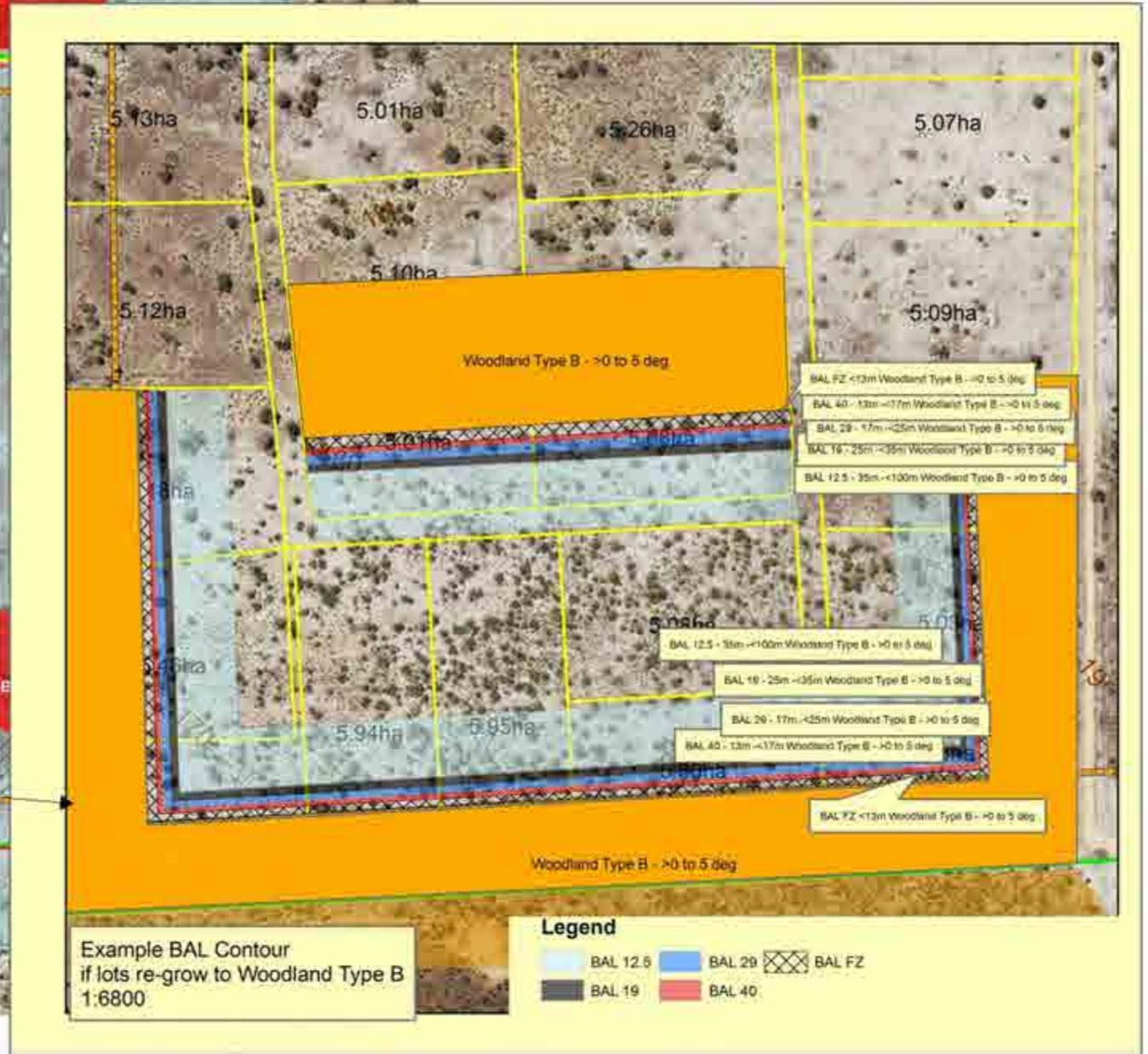
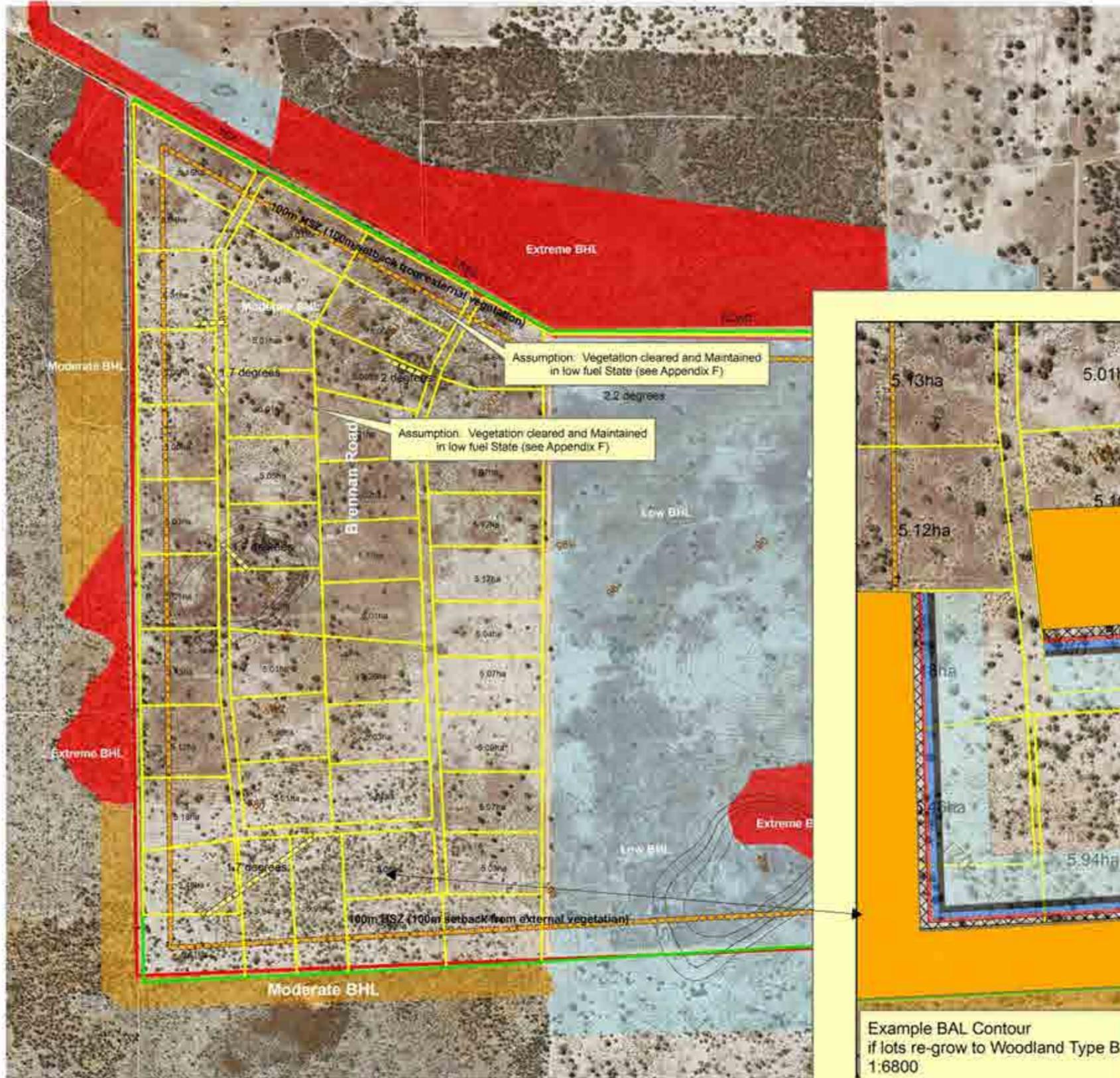
BIO DIVERSE SOLUTIONS

55 Peppermint Drive
Albany, WA 6330
Australia
Tel: 08 9841 3936
Fax: 08 9841 3936
Mob: 0447 555 516

CLIENT Lot 1 and 2 Tee Tree Road Bindoon WA		
Bushfire Hazard Level		
STATUS FINAL	FILE WHEL014	DATE 13/04/2015

Appendix E

BAL Contour Plan



Example BAL Contour if lots re-grow to Woodland Type B 1:6800

Legend

	100 HSZ		Moderate BHL
	Slope degrees		Low BHL
	Extreme BHL		Subject area



Scale 1:12000 @ A3



55 Peppermint Drive
Albany, WA 6330
Australia
Tel: 08 9841 3936
Fax: 08 9841 3936
Mob: 0447 555 516

CLIENT Lot 1 and 2 Tee Tree Road Bindoon WA		
BAL Contour Plan		
STATUS	FILE	DATE
FINAL	WHEL014	13/04/2015

Appendix F

DFES information for the homeowner

BUSHFIRE

Building Protection Zones

FACTSHEET

02

ARE YOU
BUSHFIRE
READY?www.dfes.wa.gov.auPREPARING YOUR HOME AND
PROPERTY FOR A BUSHFIRE

You should prepare your home to survive the passage of a bushfire, even if your plan is to leave. A well prepared and constructed house is more likely to survive a bushfire than an unprepared one. Firefighters cannot defend every property and are unlikely to defend a poorly prepared property; remember their lives are at risk too.



DID YOU KNOW?

Firebreaks have a number of purposes.

They are used to stop the spread of a bushfire and are also used by firefighters to gain access around all areas of your property and as a place from which to fight a fire.

Remember that firebreaks must be wide enough and have enough vertical clearance to let a firefighting truck pass.

Maintain your firebreaks to ensure your property can be defended during a fire.

- Create a minimum 20 metre building protection zone** around your home and other buildings. This area needs to be cleared of all rubbish, long dry grass, bark and material that may catch fire.
- Prune lower branches** (up to two metres off the ground) to stop a ground fire spreading into the canopy of the trees.
- Clear vegetation** around your property to create a fire break, particularly the overhanging branches. Make sure you meet your local government's firebreak requirements.
- Cut grass** to less than 10 centimetres high and prune shrubs to remove dead material.

For more information visit www.dfes.wa.gov.au or contact DFES Community Engagement 9395 9816.



Government of Western Australia
Department of Fire & Emergency Services



PREPARE ACT SURVIVE



Information Note

September 2014

What is a Building Protection Zone?

Key Points

Fuel loads influence bushfire intensity.

The lower the fire's intensity the less impact on the building.

Creating a minimum 20 metre reduced fuel load area (building protection zone) will increase the protection of the building.

• Ember protection is important to protect the building.

• Constructing or retrofitting your home to meet the Australian Standard 3959—*Construction of buildings in bushfire-prone areas*, and addressing bushfire risks in accordance with the *Planning for Bushfire Risk Management Guidelines* will ensure your house has the best bushfire protection.

Definitions

• **Scrub crown** is the green, leaf material on the scrub plants.

• **Surface fire** is the fire burning the leaves and scrub on the top of the ground.

• **Mineral earth firebreak** is a fire break without vegetation.

• **Ember attack** is where the bark and fine vegetation material is set alight, becomes airborne and is carried forward of the fire.

Managing and reducing fuel loads

Managing and reducing fuel loads for a minimum of 20 metres around a building will increase its likely survival from a bushfire.

Known as the Building Protection Zone (BPZ), the aim of this area is to ensure that there will be no direct flame contact on the building from a bushfire. By utilising fuel management options it will also be possible to reduce the potential radiant heat impact on the building.



Above: Well prepared Building Protection Zone with reduced fuel.

If there is little or nothing to burn then the fire's impact will be reduced. This can be achieved by:

- Maintaining a minimum 2 metre gap between trees and the building. Make sure that no trees overhang the house.
- Ensuring tree crowns are a minimum of 10 metres apart.
- Ensuring there is a gap between shrubs and buildings of three times their mature height.
- Ensuring shrubs aren't planted in clumps.
- Keeping the grass short and prune the scrub so that it is not dense, nor does it have fine, dead aerated material in the crown of the scrub.
- Raking up leaf litter and twigs under trees and remove trailing bark.
- Pruning lower branches (up to 2 metres off the ground) to stop a surface fire spreading to the canopy of the trees.
- Creating a mineral earth firebreak.
- Having your paths adjacent to the building and have your driveway placed so that it maximises the protection to the house.

Version 6, September 2014

For more information contact the Environmental Protection Branch on 9395 9300 • email: environment@dfes.wa.gov.au or visit www.dfes.wa.gov.au

- Storing firewood away from the building.
- Ensuring fences and sheds are constructed using non-combustible materials, but preferably not located in the BPZ.
- Keeping your gutters free of leaves and other combustible material.
- Ensuring gas bottles are secured and positioned so that they will vent away from the building, if subject to flame contact or radiant heat.

Ember attack

In a bushfire, most homes that are damaged or destroyed are from ember attack. These burning embers get into gaps within the building, such as into the roof cavity, and ignite the material within the cavity. It can take a number of hours before the burning becomes apparent and by that time the building may not be able to be saved.



Above: Reduced fuel in the Building Protection Zone contributed to the survival of this home in a bushfire.

Right: Home destroyed by bushfire, note the tree branches overhanging the house.

It is recommended that all homes that may be affected by embers be made ember proof. If a bushfire occurs in the general area, then the roof cavity and other crevices should be inspected to ensure that no embers have caused a fire. Be aware that there are electricity cables in the roof area and the introduction of water will be a safety issue.



 For more information contact the Environmental Protection Branch on 9395 9300, email: environment@dfes.wa.gov.au or visit www.dfes.wa.gov.au

BUSHFIRE

Evaporative Air Conditioners

FACTSHEET
08ARE YOU
BUSHFIRE
READY?

areyouready.wa.gov.au

DID YOU KNOW?

Your evaporative air conditioning unit can catch fire as a result of embers from bushfires, or even small back yard fires, getting into your unit. If a fire starts in your air conditioner, it can spread quickly throughout your home.

If there is smoke nearby
you should:

- Run the air conditioner to wet the filter pads.
- When smoke is over your home or ash starts to drop around your house, switch the air conditioner off.
- If possible, continue to run water over the filter with the fan turned off.
- If the water can't be run on its own, or if there is a power failure at the time, wet the air conditioner filter pads using a garden hose.
- Keep checking your air conditioner and the area around your home for spot fires from embers until the danger has passed.

It can be difficult for firefighters to put out a fire caused by embers getting into the roof space of your home. Knowing what to do to keep your evaporative air conditioner safe from fire can help save your property.

For more information on evaporative air conditioners see DFES Information Note on Ember Protection Screens.

DID YOU KNOW?

If you live within 500 metres of bushland and have a roof mounted evaporative air conditioning unit, your home may be at increased risk of ember attack.



If your home does catch fire, leave your home and call 000 immediately

WHAT IS EMBER ATTACK?

Embers are pieces of burning bark, leaves or twigs that are carried by the wind around the main fire creating spot fires.

For more information visit www.dfes.wa.gov.au or contact DFES Community Engagement 9395 9816



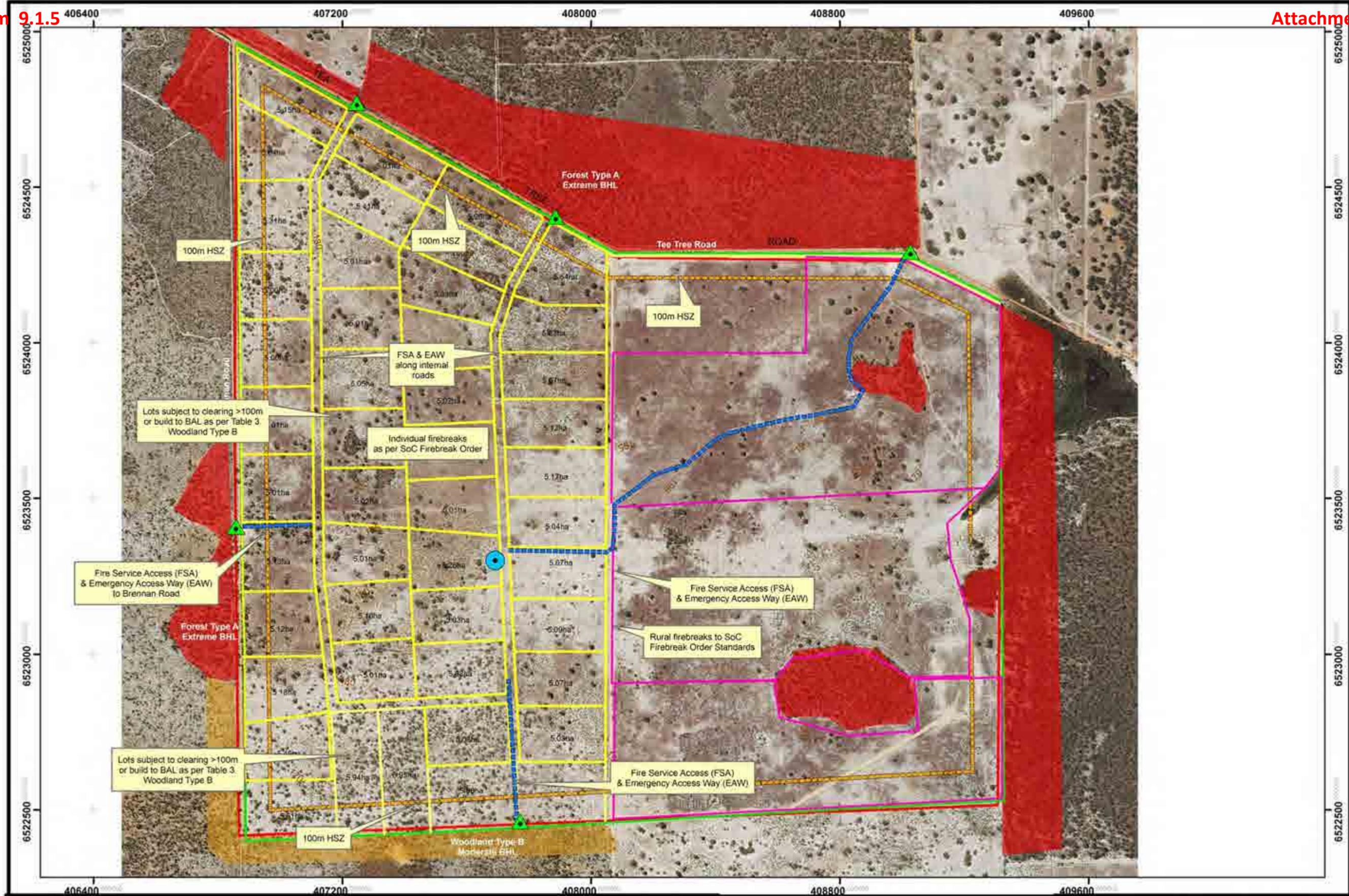
Government of Western Australia
Department of Fire & Emergency Services



PREPARE ACT SURVIVE

Appendix G

Bushfire Management Plan



Legend Access points Water tank Emergency & Fire Service Access Outline Development Plan Rural Firebreaks 100 HSZ Woodland Type B - Moderate Risks Subject area		 Scale 1:11500 @ A3 	 BIO DIVERSE SOLUTIONS 55 Peppermint Drive Albany, WA 6330 Australia Tel: 08 9841 3936 Fax: 08 9841 3936 Mob: 0447 555 516	CLIENT Marou Property Group Pty Ltd Lot 1 and 2 Tee Tree Road Bindoon WA Bushfire Management Plan STATUS: FINAL FILE: WHEL014 DATE: 13/6/2016
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APPENDIX 6

Land Capability for On-site Effluent Disposal (October, 2015)

LOTS 1 AND 2 TEA TREE ROAD, BINDOON

**LAND CAPABILITY FOR
ON-SITE EFFLUENT DISPOSAL**

Prepared for

Marou Property Developments Pty Ltd

c/- Whelans

PO Box 99

MT HAWTHORN WA 6915

Draft Report No. J15017

14 October 2015

BAYLEY ENVIRONMENTAL SERVICES

30 Thomas Street

SOUTH FREMANTLE WA 6162

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	1
2.0 ENVIRONMENTAL CHARACTERISTICS	2
2.1 Topography and Landforms	2
2.2 Geology and Soils	2
2.2.1 Overview	2
2.2.2 Soil Permeability	2
2.2.3 Phosphorus Retention Index	2
2.3 Hydrology	3
2.3.1 Surface Drainage	3
2.3.2 Groundwater	3
2.3.3 Water Quality	4
3.0 LAND CAPABILITY ASSESSMENT	4
4.0 CONCLUSION	5

LIST OF TABLES

Table	Title	Page
2.1	Phosphorus Retention Index	3
2.2	Depth to Groundwater	3

LIST OF FIGURES

Figure	Title
1	Environmental Features
2	Oblique Aerial View

LIST OF APPENDICES

Appendix	Title
A	Soil Logs
B	Water Analysis Results

1.0 INTRODUCTION

Marou Property Developments Pty Ltd plans to subdivide Lots 1 and 2 Tea Tree Rd, Bindoon (the subject land) into 47 five hectare rural smallholding lots and one balance lot of about 186ha. All lots will employ on-site effluent disposal.

Bayley Environmental Services was commissioned in August 2015 to investigate and report on the capability of the subject land to accommodate on-site effluent disposal. The investigations took place in September-October 2015 and included:

- drilling of nine boreholes across the site, focussing on areas of likely groundwater accumulation and/or drainage;
- installation of bores in three boreholes where groundwater was encountered;
- collection of soil samples from the boreholes and analysis for phosphorus retention index (PRI);
- measurement of depth to groundwater in the bores;
- collection and analysis of water samples from the bores;
- review of environmental information including aerial photography, topography, geology, soils, groundwater and previous reporting on the site by Landform Research (2000).

The conclusion from these investigations is that the subject land has a very high capability for on-site effluent disposal by conventional or alternative systems. Specifically:

- The site has low slopes (less than 10%; mostly less than 5%).
- The soils are deep, sandy and permeable with no confining layers such as clay or rock in the shallow profile.
- The water table is more than 6m deep over all but the eastern extremity of the site.
- All proposed lots have a large separation (>500m) to surface water bodies.

Details of the investigations and findings are presented below.

2.0 ENVIRONMENTAL CHARACTERISTICS

2.1 Topography and Landforms

The subject land is located on an elevated, undulating plateau at elevations for 160m AHD to 208m AHD. From high ground in the centre, west and south-east, the land falls away in broad valleys to the north-west, south-west, north-east and east. Figure 1 shows topographic contours of the site. Figure 2 shows an oblique aerial view.

The slope varies from about 10% in the steepest eastern valley to less than 1% in the centre of the site, with the slope averaging about 4% over the site.

2.2 Geology and Soils

2.2.1 Overview

The subject land is located on the Dandaragan Plateau just west of the Darling Fault. The soils are predominantly sandy, with deep yellow and yellow-brown sands, earthy sands and gravelly sands on the slopes and leached grey sands in the valleys. Ferricrete cemented sandstone rock occurs on a few ridge tops.

Landform Research Pty Ltd (2000) described and mapped the soils in detail based on 47 shallow test pits across the subject site. Figure 1 shows the Landform Research soil mapping.

Drilling of nine boreholes across the site by Bayley Environmental Services in 2015 (Figure 1) found generally sandy soils with grey and grey-brown sands to about 1m over yellow and yellow-brown sands and earthy and clayey sands. Appendix A presents the soil logs from the drilling.

2.2.2 Soil Permeability

The sandy soils have a high permeability, with no evidence of clay being found in the boreholes at less than 3m deep.

Landorm Research (2000) mapped ferricrete on some ridge tops and beneath the sandy soils of the valley slopes, but drilling in these areas in 2015 found no evidence of this beyond minor gravel to at least 6m depth.

2.2.3 Phosphorus Retention Index

Soil samples from 1m depth in the boreholes were analysed for phosphorus retention index (PRI). This depth was generally at about the interface between the grey and grey-

brown surface soils and the yellow earthy subsoils, so the results would underestimate the PRI of the subsoils.

The analysis found low PRI across the site. Table 2.1 summarises the PRI results.

Table 2.1 Phosphorus Retention Index

Site Figure 1)	BB1	BB2	BB3	BB4	BB5	BB6	BB7	BB8	BB9
PRI @ 1m	0.5	0.6	0.9	0.3	0.3	0.4	0.5	1.4	0.9

2.3 Hydrology

2.3.1 Surface Drainage

The subject land lies across a drainage divide between Chandala Brook to the west and the Brockman River to the east, both tributaries of the Swan-Avon system.

Given the deep sandy soils and low slopes of the subject land, there is no defined surface drainage. Surface runoff would be limited to short-lived overland flow during and immediately after extreme rainfall.

Surface flow begins at the eastern boundary of the site, where a small drainage line rises and flows into the Brockman River via Lake Chittering. A soak dam has been constructed just inside the eastern boundary at the beginning of this drainage line.

2.3.2 Groundwater

Groundwater is present beneath the site and is expected to flow east and west from the central high ground in line with the prevailing topography. The groundwater intersects the ground surface in the soak at the eastern boundary and in another soak just outside the boundary at the north-east corner.

Over most of the site, the groundwater is at least 6m below the surface. The depth to groundwater is likely to exceed 30m in the higher parts of the site. Table 2.2 shows the depths to groundwater found by drilling and bore measurements in September 2015.

Table 2.2 Depth to Groundwater

Site Figure 1)	BB1	BB2	BB3	BB4	BB5	BB6	BB7	BB8	BB9
Depth to Water (mbgl)	>9	>6	>9	>6	1.16	4.10	>6	>6	1.09

2.3.3 Water Quality

Analysis of samples collected from the bores and the soak dam in September 2015 shows that the groundwater quality is high, with low salinity, near-neutral pH and low nutrient levels. Appendix B presents the full results of the water analysis.

3.0 LAND CAPABILITY ASSESSMENT

Land capability for on-site effluent disposal depends on a number of factors, some of which are mandated by the Health Department's *Country Sewerage Policy* (2002):

- slope (maximum 20%);
- depth to groundwater (minimum 0.5m);
- soil profile (minimum 1.2m of free-draining soil free of rocks, clay and other confining layers);
- soil permeability (sufficient to permit infiltration but not so great as to permit unrestricted flow);
- soil purification ability (able to effectively remove bacteria, nutrients etc. from effluent by soil filtration);
- separation from surface water bodies (30-100m, depending on soil and system type);
- flooding risk (not susceptible to inundation more than once every ten years); and
- development density (maximum 10 lots equivalent per hectare in unsewered towns).

The subject land meets all of these criteria, as detailed below.

Slope

The slope of the subject land is all less than 10% and mostly less than 5%.

Groundwater Depth

The shallowest groundwater was measured at 1.09m near the eastern boundary. Over most of the site the depth to groundwater is greater than 6m.

Soil Profile

The site has deep sandy soils with no significant confining layers. Although Landform Research (2000) found ferricrete gravel and rock on ridge tops, there are no building envelopes proposed in these areas and in any case the ferricrete (cemented sandstone) would likely be permeable and/or readily excavated.

Soil Permeability

The sandy soils would be readily permeable but not excessively so.

Soil Purification Ability

The deep earthy sand subsoils would ensure very effective removal of contaminants before the effluent reaches the water table. Although the PRI at 1m depth is low, the change in soil colour at most sites below this depth indicates that the subsoil PRI would be higher. Added to this, the large depth to groundwater will ensure effective uptake of phosphorus from effluent.

The exception to this is the eastern side of the subject land, where leached white sands and shallower groundwater (less than 2m) would require alternative treatment systems. However, the development plan shows no building envelopes within this zone.

Separation from Water Bodies

The nearest surface water bodies are the soak dam near the eastern boundary and the wetland just outside the north-eastern corner of the site. The nearest building envelopes are more than 500m from these water bodies.

Flooding/Inundation Risk

There is no risk of inundation anywhere on the subject land.

Development Density

The Country Sewerage Policy limits unsewered development in Bindoon to ten residences (or equivalent) per hectare. The total of 48 lots proposed on the subject land is equivalent to less than one residence per hectare.

4.0 CONCLUSION

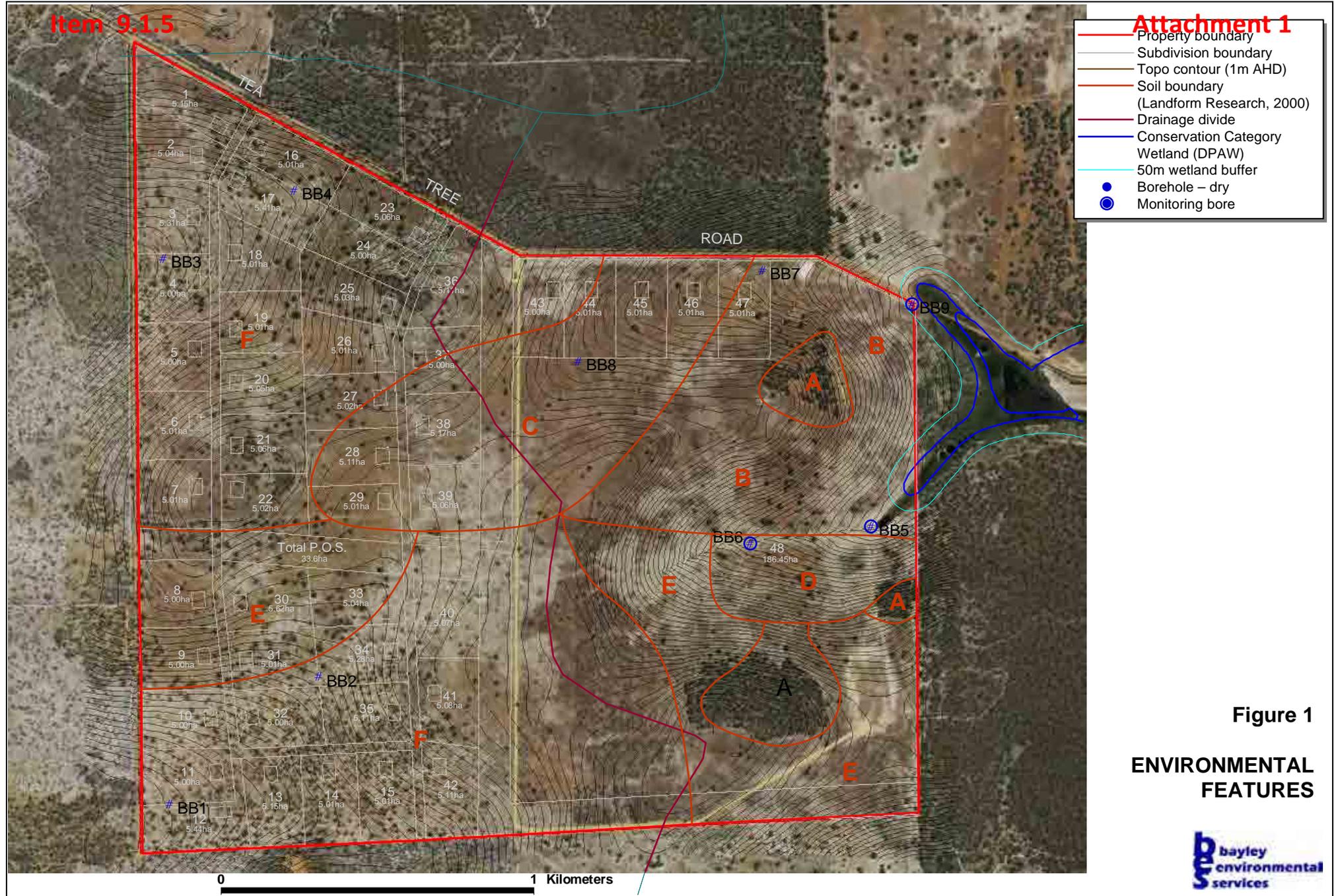
This investigation has concluded that the subject land has very high capability to support on-site effluent disposal using conventional or alternative treatment systems for the development as proposed.

-

Figures

Item 9.1.5

Attachment 1



- Property boundary
- Subdivision boundary
- Topo contour (1m AHD)
- Soil boundary
- (Landform Research, 2000)
- Drainage divide
- Conservation Category
- Wetland (DPAW)
- 50m wetland buffer
- Borehole – dry
- ⊙ Monitoring bore

Figure 1

**ENVIRONMENTAL
FEATURES**



0 200 metres
Vertical exaggeration: 3x

Figure 2
OBLIQUE AERIAL VIEW

Appendix A

Soil Logs

SOIL PROFILE LOG

PROJECT NUMBER:	J15017
SITE ID:	BB1
EASTING:	406974
NORTHING:	6522556
METHOD:	Auger rig
TOTAL DEPTH (mbgl):	9m
REFUSAL (Y/N):	N
DATE:	7/09/2015
DEPTH TO WATER (mbgl)	>9m

SOIL PROFILE		SAMPLE DATA	
DEPTH (m)	SOIL DESCRIPTION	SAMPLE ID	INTERVAL (m)
0 - 0.5	Dark grey sand		
1 - 3.5	Pale brown-grey sand, paler and finer with depth		
4 - 4.5	Grey-brown sand with occasional gravel to 10mm		
5	Yellow-brown sand with occasional gravel to 10mm		
5.5	Brown-yellow sand with occasional gravel to 10mm		
6 - 7	Brown-yellow earthy sand with occasional gravel to 15mm		
7.5 - 9	Brown-yellow coarse sandy clay with occasional white clay lumps		



SOIL PROFILE LOG

PROJECT NUMBER:	J15017
SITE ID:	BB2
EASTING:	407441
NORTHING:	6522958
METHOD:	Auger rig
TOTAL DEPTH (mbgl):	6m
REFUSAL (Y/N):	N
DATE:	7/09/2015
DEPTH TO WATER (mbgl)	>6m

SOIL PROFILE		SAMPLE DATA	
DEPTH (m)	SOIL DESCRIPTION	SAMPLE ID	INTERVAL (m)
0 - 0.5	Grey sand		
1	Pale grey sand		
1.5	Very pale grey sand		
2 - 2.5	Cream sand		
3 - 3.5	Pale yellow-brown sand with occasional gravel to 15mm		
4	Yellow-brown sand with occasional gravel to 15mm		
4.5	Coarse yellow earthy sand with common gravel to 15mm		
5 - 6	Orange coarse clayey gritty sand		



SOIL PROFILE LOG

PROJECT NUMBER:	J15017
SITE ID:	BB3
EASTING:	406954
NORTHING:	6524278
METHOD:	Auger rig
TOTAL DEPTH (mbgl):	9m
REFUSAL (Y/N):	N
DATE:	7/09/2015
DEPTH TO WATER (mbgl)	>9m

SOIL PROFILE		SAMPLE DATA	
DEPTH (m)	SOIL DESCRIPTION	SAMPLE ID	INTERVAL (m)
0 - 0.5	Brown-grey sand		
1	Yellow-brown sand		
1.5 - 2	Yellow sand		
2.5 - 3	Yellow sand with occasional gravel to 10mm		
3.5	Yellow sand with occasional gravel to 20mm		
4	Brown-yellow coarse sand with gravel to 25mm		
4.5 - 6	Orange-brown-yellow earthy sand with gravel to 25mm		
6.5 - 7	Red gritty clayey sand		
7.5 - 9	Red gritty clayey sand, more clay		



SOIL PROFILE LOG

PROJECT NUMBER:	J15017
SITE ID:	BB4
EASTING:	407365
NORTHING:	6524494
METHOD:	Auger rig
TOTAL DEPTH (mbgl):	6m
REFUSAL (Y/N):	N
DATE:	7/09/2015
DEPTH TO WATER (mbgl)	>6m

SOIL PROFILE		SAMPLE DATA	
DEPTH (m)	SOIL DESCRIPTION	SAMPLE ID	INTERVAL (m)
0 - 0.5	Grey sand		
1	Very pale brown-grey sand, coarse		
1.5 - 2	Very pale grey sand, finer		
2.5 - 3	Pale yellow-brown sand with occasional gravel to 15mm		
3.5 - 5.5	Yellow-brown gravelly sand wo 20mm		
6	Red-brown earthy sand with gravel to 20mm		



SOIL PROFILE LOG

PROJECT NUMBER:	J15017
SITE ID:	BB5
EASTING:	409178
NORTHING:	6523433
METHOD:	Auger rig
TOTAL DEPTH (mbgl):	4.5m
REFUSAL (Y/N):	N
DATE:	7/09/2015
DEPTH TO WATER (mbgl)	~1.25m

SOIL PROFILE		SAMPLE DATA	
DEPTH (m)	SOIL DESCRIPTION	SAMPLE ID	INTERVAL (m)
0 - 2	Brown-grey sand, medium coarse, wet from ~1.25m		
2.5 - 3	Grey-brown sand, medium coarse		
3.5 - 4.5	Pale grey sand, medium coarse	Cased to 4.5m	



SOIL PROFILE LOG

PROJECT NUMBER:	J15017
SITE ID:	BB7
EASTING:	408836
NORTHING:	6524241
METHOD:	Auger rig
TOTAL DEPTH (mbgl):	6m
REFUSAL (Y/N):	N
DATE:	7/09/2015
DEPTH TO WATER (mbgl)	>6m

SOIL PROFILE		SAMPLE DATA	
DEPTH (m)	SOIL DESCRIPTION	SAMPLE ID	INTERVAL (m)
0 - 0.5	Grey sand		
1 - 1.5	Yellow-brown sand		
2 - 6	Orange earthy sand, moist		



SOIL PROFILE LOG

PROJECT NUMBER:	J15017
SITE ID:	BB8
EASTING:	408258
NORTHING:	6523954
METHOD:	Auger rig
TOTAL DEPTH (mbgl):	6m
REFUSAL (Y/N):	N
DATE:	7/09/2015
DEPTH TO WATER (mbgl)	>6m

SOIL PROFILE		SAMPLE DATA	
DEPTH (m)	SOIL DESCRIPTION	SAMPLE ID	INTERVAL (m)
0 - 0.5	Yellow-brown sand		
1 - 1.5	Yellow sand		
2 - 6	Orange earthy sand, moist		



SOIL PROFILE LOG

PROJECT NUMBER:	J15017
SITE ID:	BB9
EASTING:	409306
NORTHING:	6524134
METHOD:	Auger rig
TOTAL DEPTH (mbgl):	4.5m
REFUSAL (Y/N):	N
DATE:	7/09/2015
DEPTH TO WATER (mbgl)	~1.5m

SOIL PROFILE		SAMPLE DATA	
DEPTH (m)	SOIL DESCRIPTION	SAMPLE ID	INTERVAL (m)
0 - 0.5	Grey sand		
1 - 2	Pale grey sand, medium coarse, wet from ~1.5m		
2.5	Brown sand		
3 - 4	Grey-brown sand		
4.5	Dark brown earthy sand	Cased to 4.5m	



Appendix B

Water Analysis Results

LABORATORY REPORT

Bayley Environmental Services

ARL Job No: 15-7050

Revision: 00

Date: 9 October 2015

Metals in Water Sample No: Sample Description:	LOR	UNITS	15-7050-1 BB5	15-7050-2 BB6	15-7050-3 BB9	15-7050-4 Dam
Aluminium - Dissolved	0.1	mg/L	<0.1	<0.1	<0.1	<0.1
Arsenic III	0.001	mg/L	<0.001	<0.001	<0.001	<0.001
Arsenic V	0.001	mg/L	<0.001	<0.001	<0.001	<0.001
Calcium - Dissolved	0.1	mg/L	1.3	1.1	1.7	1.4
Cadmium - Dissolved	0.002	mg/L	<0.002	<0.002	<0.002	<0.002
Chromium III	0.01	mg/L	<0.01	<0.01	<0.01	<0.01
Copper - Dissolved	0.01	mg/L	<0.01	<0.01	<0.01	<0.01
Iron - Dissolved	0.01	mg/L	<0.01	<0.01	<0.01	<0.01
Mercury - Dissolved	0.0002	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Potassium - Dissolved	0.1	mg/L	1.2	0.8	1.2	2.6
Magnesium - Dissolved	0.1	mg/L	2.6	3.1	6.5	6.4
Sodium - Dissolved	0.1	mg/L	35	31	89	78
Nickel - Dissolved	0.01	mg/L	<0.01	<0.01	<0.01	<0.01
Lead - Dissolved	0.01	mg/L	<0.01	<0.01	<0.01	<0.01
Zinc - Dissolved	0.01	mg/L	<0.01	<0.01	<0.01	<0.01
Total Nitrogen in Water Sample No: Sample Description:	LOR	UNITS	15-7050-1 BB5	15-7050-2 BB6	15-7050-3 BB9	15-7050-4 Dam
Total Nitrogen	0.2	mg/L	5.9	3.8	4.1	4.2
TKN	0.2	mg/L	<0.2	<0.2	<0.2	<0.2
Total Phosphorus in Water Sample No: Sample Description:	LOR	UNITS	15-7050-1 BB5	15-7050-2 BB6	15-7050-3 BB9	15-7050-4 Dam
Total Phosphorus	0.01	mg/L	0.05	0.02	0.09	0.03
Ions by Discrete Analyser Sample No: Sample Description:	LOR	UNITS	15-7050-1 BB5	15-7050-2 BB6	15-7050-3 BB9	15-7050-4 Dam
Chloride	5	mg/L	55	21	120	100
Sulphate	1	mg/L	11	8	4	15
Filterable Reactive Phosphorus	0.01	mg/L	0.01	<0.01	0.01	<0.01
NO _x -N	0.01	mg/L	5.9	3.8	4.1	4.2
Physical Parameters Sample No: Sample Description:	LOR	UNITS	15-7050-1 BB5	15-7050-2 BB6	15-7050-3 BB9	15-7050-4 Dam
Acidity	5	mgCaCO ₃ /L	32	88	32	20
Alkalinity	5	mgCaCO ₃ /L	<5	<5	<5	8
Chromium (VI)	0.002	mg/L	<0.002	<0.002	<0.002	<0.002
Conductivity	0.01	mS/cm	0.15	0.12	0.43	0.37
Total Suspended Solids	5	mg/L	51	8	250	<5
pH	0.1	pH units	6.4	6.2	5.2	5.6
Misc. Inorganics in Water Sample No: Sample Description:	LOR	UNITS	15-7050-1 BB5	15-7050-2 BB6	15-7050-3 BB9	15-7050-4 Dam
Hardness	5	mgCaCO ₃ /L	14	16	31	30

Agency Submissions			
Submitter	Comment	Proponent Response	Shire Officer Response
Main Roads WA	<p>In reference to your correspondence of the 6 April 2017 with attachments, Main Roads WA (MRWA) has determined from the information provided that the proposed amendment is supported subject to compliance with MRWA control of access requirements for the future Great Northern Highway corridor, specifically Bindoon Bypass.</p> <p>MRWA can confirm that the officially endorsed corridor for the bypass of Bindoon passes through the eastern portion of Lot 1 Teatree Road. Lot 2 Teatree Road will not be impacted by the acquisition of land for the construction of the Bindoon Bypass.</p> <p>The owners of this property have been informed of the endorsed corridors and have been provided with the indicative road reserve boundary (copy attached). The owners have also been liaising with MRWA in good faith to assist in identifying a suitable local access road location to pass through their property to allow access to the property to the south, which will be severed once land acquisition for the bypass is completed. It is expected that land acquisition will commence in the second half of 2017 and construction of the bypass could commence in mid 2019 subject to construction funding.</p>	<p>Advice noted. The Landowner will continue to liaise with the MRWA in relation to the Bypass and acquisition of land for access purposes.</p>	
Chittering Landcare	<p>The Ellen Brockman Integrated Catchment Group in collaboration with the Chittering Landcare Group have reviewed the documentation relating to the above proposed scheme amendment 56 to create Rural Small Holdings at 4 to 5 hectare lots.</p> <p>We have no objection to Rural Small Holdings being developed on the site as outlined in the report as long as these properties are no smaller than 4 to 5 hectares in size. However, we do wish to make the following comments.</p> <p>The owner of the property does have a licenced bore but the allocation on application to the Department of Water was less than requested at the time following submissions outlining the fragility of the supply. It was stated to the Department of Water that any excessive pumping of groundwater in this small sub catchment has a detrimental effect on the water supplied to the Conservation Category Wetland and Spoonbill Reserve Lake.</p> <p>Mr Dom Cummins, DOW, has been approached by the catchment group on several occasions to outline that any further allocations of water to pump groundwater substantially reduces the water flow to the wetland and Spoonbill Lake.</p> <p>Previously, DOW has had to warn landholders illegally accessing the water to desist immediately. A good example of the effect of pumping the ground water followed the use of groundwater (from a licenced bore) by Parkwood estate during February one year for road building. This substantially lowered the water in Spoonbill to a dangerously low level. When pumping stopped the water level rose again.</p> <p>The Spoonbill Reserve Lake is a Shire of Chittering asset that is not only for recreation and conservation but is the emergency water supply during the</p>	<p>Advice noted. The following response is provided</p> <ul style="list-style-type: none"> • There is no intention of any future subdivision of the land creating any lots smaller than 5ha. • As stated in the Scheme Amendment report document there will be a requirement for all future landowners to construct and maintain adequate rain catchment facilities to adequately water for each lot. • The existing licence for bore water will only be used by the existing landowner and all future landowners of the 'Small Rural Landholdings' will need to apply for separate bore licences, the control of which will regulate the limited groundwater use in the catchment. 	

	<p>fire season for fire fighting purposes. Thus the statement in the report under 2.3, Opportunities, the statement “abundant accessible groundwater” gives the false impression that water is an infinite supply. Landholders would be able to access groundwater for household use, watering of livestock and irrigating 0.4Ha of home orchard and garden only. Anything more than this would require a licence. Any application for a water licence would be opposed by the Catchment Group once advertised to protect the integrity of the conservation category wetland, Spoonbill Lake and subsequently, Lake Chittering.</p> <p>It is unknown what the effect of this allowable access to groundwater would have on the natural assets but household water supply can also be supplemented with rainwater captured in tanks.</p>		
<p>Department of Water</p>	<p>The Department of Water (DoW) has considered the proposed amendment and would like to recommend the following condition:</p> <p>District Water Management Strategy</p> <p>The Department of Water (DoW) considers the proposed amendment should be support by a District Water Management Strategy (DWMS). The DWMS should be consistent with the <i>Better Urban Water Management</i> document (WAPC, 2008) and the policy measures outlined in <i>State Planning Policy 2.9</i>.</p>	<p>Advice Noted. This information can be supplied as part of the documentation compiled to support the structure plan associated with the development of the landholding</p>	
<p>Department of Parks and Wildlife</p>	<p>The Department of Parks and Wildlife does not object to the proposal, however does provide the following advice:</p> <p>Parks and Wildlife is aware that the subject area contains potential breeding, roosting and feeding habitat for black cockatoos, which are protected under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act). The Structure Plan and Bushfire Management Plan documents indicate there may be significant trees cleared as part of this proposal, however a survey of habitat trees is required to determine the level of impact proposed.</p> <p>If it is likely that the proposed development may result in one or more of the following;</p> <ul style="list-style-type: none"> - clearing of any known nesting tree, - clearing of any part or degradation of breeding habitat, - clearing of more than 1 hectare of quality foraging habitat, or - clearing or degradation (including pruning the top canopy) of a known roosting site, <p>then the proposal should be referred to the Commonwealth for assessment under the EPBC Act as it is likely to significantly impact upon a matter of national environmental significance.</p> <p>The “<i>EPBC Act Referral guidelines for three threatened black cockatoo species: Carnaby’s cockatoo, Baudin’s cockatoo and Forest red-tailed black cockatoo</i>” (DSEWPaC 2012) provides further information on this requirement.</p>	<p>Advice noted. Studies pertaining to the breeding, roosting and feeding habitat of black cockatoos can be supplied as part of the documentation compiled to support the structure plan associated with the development of the landholding.</p> <p>It is also noted that the strategy for clearing land can be altered to allow for limited clearing to occur at the time the exact location of proposed internal roads and building envelopes are established.</p> <p>Consideration can also be given to increasing the BAL rating to individual residences when construction occurs in accordance with the Bushfire Management Plan relevant to the approved structure plan</p>	

	<p>The Bushfire Management Plan recommends that the developer/landowner clear the lots of native vegetation prior to sale. This action will impact on the threatened black cockatoo species using this area. It is recommended that the lots be cleared only once the location of houses are known, allowing the hazard separation zone and building protection zone to be measured accurately which will reduce the clearing required. An increase in building construction standards to AS3959-2009 BAL19 or BAL29 will also allow for a decrease in the amount of vegetation clearing required around the buildings.</p>		
Public Submissions			

*Note: Comments are as per original submission received by the Shire. Submission comments have not been edited unless for the purposes of confidentiality where necessary.

FORM N 1

FORM APPROVED
NO. B2594

WESTERN AUSTRALIA
TRANSFER OF LAND ACT 1893 AS AMENDED

NOTIFICATION UNDER SECTION 70A

DESCRIPTION OF LAND (Note 1)

EXTENT

VOLUME

FOLIO

Lot 650 on Deposited Plan 411463	Whole		
Lot 651 on Deposited Plan 411463	Whole		

REGISTERED PROPRIETOR (Note 2)

HM2 ENTERPRISES PTY LTD (ACN 096 422 249) formerly of Care of Beattie & Associates Suite 12 398 Great Eastern Highway Ascot but now of 65 Fewster Street MUCHEA WA 6501

LOCAL GOVERNMENT / PUBLIC AUTHORITY (Note 3)

SHIRE OF CHITTERING

FACTOR AFFECTING USE OR ENJOYMENT OF LAND (Note 4)

(See page 2)

Dated this _____ day of _____ Year 2017

LOCAL GOVERNMENT / PUBLIC AUTHORITY ATTESTATION (Note 5)

REGISTERED PROPRIETOR/S SIGN HERE (Note 6)

For Execution see Page 3

For Execution see Page 3

FACTORS AFFECTING USE OR ENJOYMENT OF THE LAND (Note 4)

Registered proprietors and prospective purchasers of the land described above or any part thereof are notified that the use of the land is subject to conditions of Western Australian Planning Commission subdivision approval No. 154174 dated 13 February 2017 which affect the use of the land in the following manner:

- (a) A mains potable water supply is not available to the lot/s.
- (b) A reticulated sewerage service is not available to the lot/s. A suitable on-site effluent disposal system to be specification of the Department of Health and local government is required. Additional building requirements may apply to development on the land.
- (c) The land is within 300 metres of the Dampier to Bunbury Natural Gas Pipeline. Additional planning and building requirements may apply to development on this land.

Further information may be obtained from the offices of the local government.

NOTIFICATION UNDER SECTION 70A

EXECUTED by HM2 ENTERPRISES
PTY LTD (ACN 096 422 249) pursuant to
section 127 of the Corporations Act:

[Redacted Signature]

Signature of Sole Director & Sole Secretary

[Redacted Name]

Full Name of Sole Director & Sole Secretary

THE COMMON SEAL of the SHIRE OF)
CHITTERING was hereunto affixed in the)
presence of:)

SHIRE PRESIDENT

(PRINT FULL NAME)

CHIEF EXECUTIVE OFFICER

(PRINT FULL NAME)

INSTRUCTIONS

1. If insufficient space in any section, Additional Sheet, Form B1, should be used with appropriate headings. The boxed sections should only contain the words "see page ..."
2. Additional Sheets shall be numbered consecutively and bound to this document by staples along the left margin prior to execution by the parties.
3. No alteration should be made by erasure. The words rejected should be scored through and those substituted typed or written above them, the alteration being initialled by the persons signing this document and their witnesses.

NOTES

1. **DESCRIPTION OF LAND**
 Lot and Diagram/Plan/Strata/Survey-Strata Plan number or Location name and number to be stated.
 Extent - Whole, part or balance of the land comprised in the Certificate of Title to be stated.
 The Volume and Folio number, to be stated.
2. **REGISTERED PROPRIETOR**
 State full name and address of the Registered Proprietors as shown on the Certificate of Title and the address / addresses to which future Notices can be sent.
3. **LOCAL GOVERNMENT / PUBLIC AUTHORITY**
 State the name of the Local Government or the Public Authority preparing and lodging this notification.
4. **FACTOR AFFECTING THE USE AND ENJOYMENT OF LAND**
 Describe the factor affecting the use or enjoyment of land.
5. **ATTESTATION OF LOCAL GOVERNMENT / PUBLIC AUTHORITY**
 To be attested in the manner prescribed by the Local Government Act or as prescribed by the Act constituting the Public Authority.
6. **REGISTERED PROPRIETOR'S EXECUTION**
 A separate attestation is required for every person signing this document. Each signature should be separately witnessed by an Adult Person. The address and occupation of the witness must be stated.

OFFICE USE ONLY

NOTIFICATION

LODGED BY	McLeods
ADDRESS	220 - 222 Stirling Highway CLAREMONT WA 6010
PHONE No.	9383 3133
FAX No.	9383 4935
REFERENCE No.	FG:CHIT:41130 s.70A Notification
ISSUING BOX No.	346K

PREPARED BY	McLeods
ADDRESS	220 - 222 Stirling Highway CLAREMONT WA 6010
PHONE No.	9383 3133
FAX No.	9383 4935

INSTRUCT IF ANY DOCUMENTS ARE TO ISSUE TO OTHER THAN LODGING PARTY.

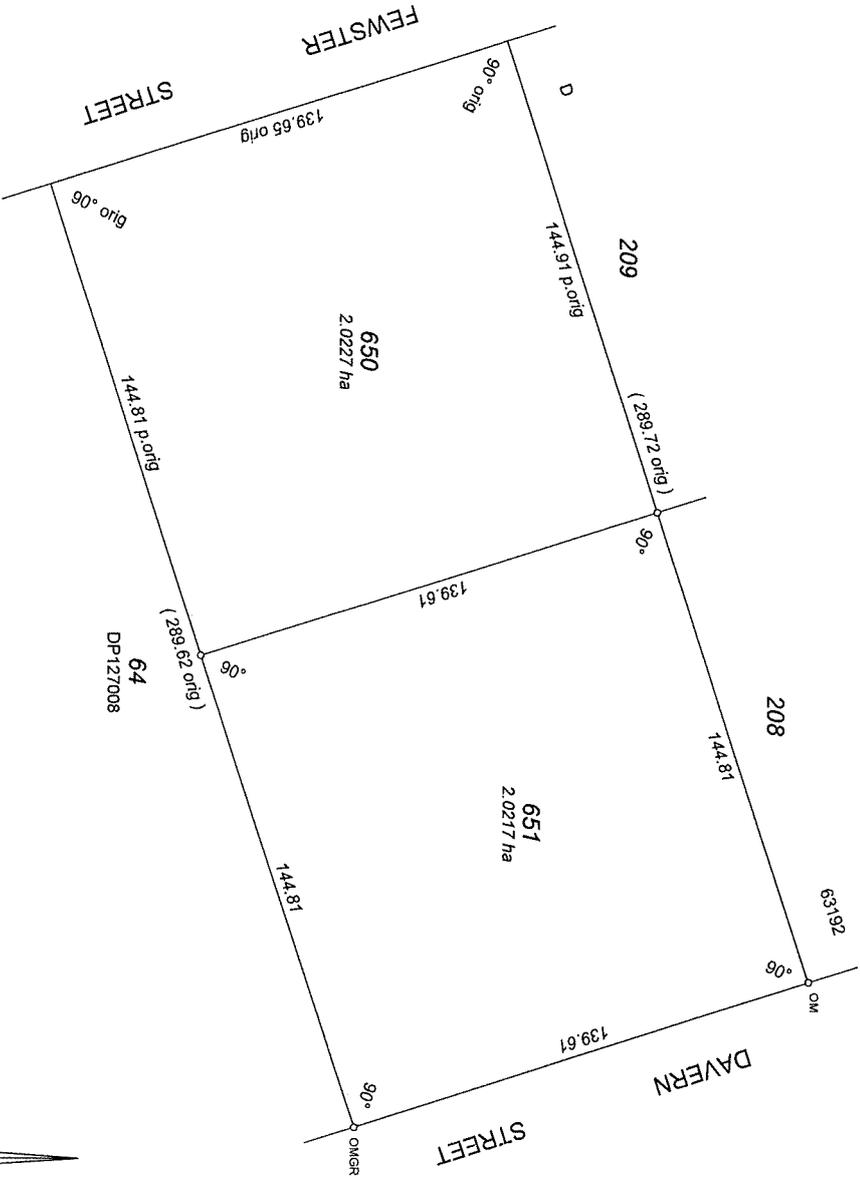
TITLES, LEASES, DECLARATIONS ETC. LODGED HEREWITH

1.	_____	Received Items
2.	_____	Nos.
3.	_____	
4.	_____	
5.	_____	
6.	_____	Receiving Clerk

Lodged pursuant to the provisions of the TRANSFER OF LAND ACT 1893 as amended on the day and time shown above and particulars entered in the Register.

EXAMINED

LIMITED IN DEPTH TO 60.96 METRES

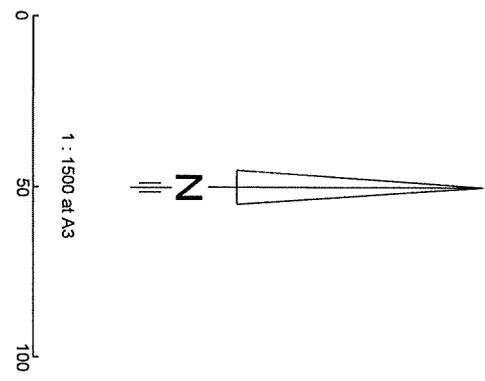


TOTAL SURVEY SOLUTIONS
 LICENSED SURVEYORS
 10 GARROW COURT
 KINGSLEY, W.A. 6026.
 MOBILE: 0411 588277
 EMAIL: tss@tspg.com.au

INTERESTS AND NOTIFICATIONS

SUBJECT	PURPOSE	STATUTORY REFERENCE	ORIGIN	LAND BURDENED	BENEFIT TO	COMMENTS
	NOTIFICATION	SEC 148 OF THE P & D ACT	DOC	LOTS 650 & 651		BUSHFIRE PRONE AREA (WAPC)
	NOTIFICATION	SEC 70A OF THE TLA	DOC	LOTS 650 & 651		LOCATION TO DBNGP (SHIRE OF CHITTERING)
	NOTIFICATION	SEC 70A OF THE TLA	DOC	LOTS 650 & 651		NO MAINS POTABLE WATER SUPPLY (SHIRE OF CHITTERING)
	NOTIFICATION	SEC 70A OF THE TLA	DOC	LOTS 650 & 651		NO RETICULATED SEWERAGE SERVICE (SHIRE OF CHITTERING)

VERSION	AMENDMENT	AUTHORISED BY	DATE
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TYPE	FREEHOLD	SSA #	968/NO
PURPOSE	SUBDIVISION		
PLAN OF	LOTS 650 AND 651		
FORMER TENURE	LOT 65 ON DP127008 C/T 2767 - 978		
LOCAL AUTHORITY	SHIRE OF CHITTERING		
LOCALITY	MUCHEA		
D.O.L. FILE			
FIELD RECORD	140117		
SURVEYOR'S CERTIFICATE - Reg 54			
1. LEONARDO MANNELLA			
I hereby certify that this plan is accurate and is a correct representation of the -			
(a) survey and / or field measurements			
(b) field records ("delete if inapplicable")			
undertaken for the purposes of this plan and that it complies with the relevant written law(s) in relation to which it is lodged.			
Licensed Surveyor	Date		
LODGED			
DATE	FEE PAID	ASSESS. No.	
I.S.C.	EXAMINED	DATE	
WESTERN AUSTRALIAN PLANNING COMMISSION			
FILE	154174		
DELEGATED UNDER SEC 16 OF THE P & D ACT 2005	DATE		
SUBJECT TO	IN ORDER FOR DEALINGS		
FOR INSPECTOR OF PLANS & SURVEYS	APPROVED	DATE	
INSPECTOR OF PLANS & SURVEYS	DATE		
(S. 18 Licensed Surveyors Act 1939)			
DEPOSITED PLAN			
411463			
SHEET	1	OF	1
VERSION	1		