



Noonamah Ridge Estate

Significant Development Proposal & Notice of Intent - Sections 4574, 3476, 3477, Redcliffe Road Hundred of Strangways, Lloyd Creek

Client:
Intrapac Projects

Date:
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Executive Summary

Elton Consulting has been engaged by Intrapac Projects to prepare an application addressing the proposed creation of a new rural community in Noonamah. The application comprises two applications for simultaneous processing:

- » A **Significant Development Proposal**, lodged with the Minister for Lands, Planning and the Environment under Section 50A of the *Planning Act*.
- » A **Notice of Intent** lodged with the Northern Territory Environment Protection Authority.

Project Vision

The vision for the proposed residential subdivision is to provide a high quality residential estate, providing a range of lot sizes and typologies, with an emphasis on retaining rural character and amenity. The estate will be serviced by a local town centre encouraging cohesion and social amenity, including the provision of land for a new primary school, retail facilities, a community centre and land for new volunteer fire brigades. The development will aim to connect to the surrounding rural area, providing the opportunity to create a strong sense of community.

Development Components & Yield

The proposed development will:

- » Provide approximately **3,500** new residential allotments
- » Provide a range of lot types and density encouraging diversity in residential options within the rural area
- » Provide a local town centre structure around a town square and open space, providing a range of retail, commercial and social opportunities
- » Provide an interconnected open space system, incorporating significant environmental features and providing for ecological corridors.

Site Description

Location

The proposed Noonamah Ridge Residential Estate is located in the rural hinterland of the greater Darwin region, approximately 36km south east of Darwin CBD, 37km from Darwin International airport, and 23km south east of Palmerston CBD. The Humpy Doo Local town Centre is located roughly 7km to the north west of the site, while the Noonamah tavern and service station are located 6km directly to the West on Stuart Highway.

Legal Description

The development proposal comprises three land parcels, outlined below.

Registered Description	Section 4574, Hundred of Strangways	Section 3476, Hundred of Strangways	Section 3477, Hundred of Strangways
Address	655 Redcliffe Road, Lloyd Creek	905 Redcliffe Road, Lloyd Creek	1225 Redcliffe Road, Lloyd Creek
Size	616.5ha	1,031ha	1,033ha
Current Zoning	Rural Living	Multiple Zoning • Rural Living • Utilities • Main Road	Multiple Zoning • Rural • Rural Living • Utilities • Main Road
Local Government Area	Litchfield		
Current ownership	Koolpinyah Station Pty. Ltd.		

Source: NT Atlas and Spatial Directory

Merits

A development of this scale will have significant benefits to the greater Darwin region, through the provision of

- » Much needed residential opportunities,
- » A range of lot typologies in a rural setting providing alternatives to a rural lifestyle that does not currently exist
- » The creation of a new local town centre within the rural area accommodating retail and commercial land uses, a new regional school and a variety of recreation activities
- » The creation of a regional open space network providing opportunities for the retention of ecological corridors and natural drainage systems, as well as for the creation of active and passive recreation.

The application is considered to be a Significant Development on the basis that it:

- » Requires a development permit prior to development
- » Will provide a development that will be significant to the future development of the Darwin Region through:
 - > The provision of a new local town centre
 - > The provision of over 3500 residential opportunities incorporating a range in lot sizes, character and typologies
 - > Provide employment opportunities
 - > Provide new recreation, social and community facilities including the site for a new school

- » The development will also affect the development of the Greater Darwin Regional Land Use Strategy, and direction of strategic planning for the future growth of the Top End
- » Will affect the natural environment, as determined by the Planning Act, within the framework of the allowing the land capability to inform the physical development of the site.

The provisional environmental assessment has further shown that the site comprises a broad diversity in land types, with generally a high level of land capability.

The design process is intended to be environmentally responsive, allowing the land capability to dictate the lot density and road layout.

The application is consequently submitted for the Minister's favourable response.

PART A: PROJECT BACKGROUND

1 Introduction

This section outlines:

- » The purpose of this report
- » The significant development application
- » The Notice of Intent
- » Background to the project proponent
- » The project team

1.1 Purpose of this Report

Elton Consulting has been engaged by Intrapac Projects to prepare an application addressing the proposed creation of a new rural community in Noonamah. The application comprises two applications for simultaneous processing:

- » A **Significant Development Proposal**, lodged with the Minister for Lands, Planning and the Environment under Section 50A of the *Planning Act*.
- » A **Notice of Intent** lodged with the Northern Territory Environment Protection Authority.

1.2 Significant Development Proposal

The proposal comprises a 2,600ha property with the potential to deliver in excess of 3500 residential opportunities, along with supporting community infrastructure and the creation of a new local town centre.

A development of this scale will have significant benefits to the greater Darwin region, through the provision of

- » Much needed residential opportunities,
- » A range of lot typologies in a rural setting providing alternatives to a rural lifestyle that does not currently exist
- » The creation of a new local town centre within the rural area accommodating retail and commercial land uses, a new regional school and a variety of recreation activities
- » The creation of a regional open space network providing opportunities for the retention of ecological corridors and natural drainage systems, as well as for the creation of active and passive recreation.

The requirements for a development to be considered a Significant Development Proposal under the Northern Territory Planning Act are outlined on overleaf.

"50A Significant Development Proposal

- (1) A proposed development of land is a ***significant development proposal*** in relation to the land if the development, as proposed:
 - (a) requires a development permit; and
 - (b) may be significant to future land use and development in the Territory.
- (2) A proposed development of land is taken to be significant to future land use and development in the Territory if any of the following circumstances apply:
 - (a) the carrying out of the development, or subsequent use of the land, may have a significant impact on any of the strategic planning mentioned in section 2A(2)(a) or (b);
 - (b) the carrying out of the development, or subsequent use of the land, may have a significant impact on the natural environment or existing amenity of:
 - (i) that land or adjoining land; or
 - (ii) other areas of land;
 - (c) another circumstance prescribed by regulation.
- (3) Without limiting subsection (2)(c), a regulation may prescribe a circumstance by reference to:
 - (a) the type of development proposed; or
 - (b) the extent of the possible impacts of the development, as proposed, on the natural environment or existing amenity of land."

With the above considered, the application is considered to:

- » Require a development permit prior to development
- » To provide a development that will be significant to the future development of the Darwin Region through:
 - > The provision of a new local town centre
 - > The provision of over 3500 residential opportunities incorporating a range in lot sizes, character and typologies
 - > Provide employment opportunities
 - > Provide new recreation, social and community facilities including the site for a new school
- » The development will also affect the development of the Greater Darwin Regional Land Use Strategy, and direction of strategic planning for the future growth of the Top End
- » Will affect the natural environment, as determined by the Planning Act, within the framework of the allowing the land capability to inform the physical development of the site.

As such, the proposed Noonamah Ridge Estate can clearly be classified as a **Significant Development** under Section 50A of the Planning Act.

1.2.1 Objectives of the Significant Development Proposal

The objectives of this **significant development proposal** are twofold:

- » To provide the Minister for Lands, Planning and the Environment (the Minister) as well as the Northern Territory Planning Commission with early advice of the strategic development intent, in order to inform strategic planning currently being undertaken at a regional level.
- » To obtain preliminary advice and support from the Minister and the NT Planning Commission on the development approach, and procedural requirements to inform the detailed Rezoning and Subdivision Applications, specifically to support the proposed planning pathway that will allow for an incremental approach to specialist environmental studies based on the varied land capabilities across the site.
- » Demonstrate that the development will respond to the varied land capability of the site, and early development of portions of the site comprising unconstrained land.

1.3 Notice of Intent

The simultaneous lodgement of the **Notice of Intent** will allow the Northern Territory Environment Protection Authority to consider the environmental implications of the development in the context of a well-developed and robust strategic concept for the site.

The evaluation of the Environment Protection Authority and consequent recommendation to the Minister for Lands, Planning and the Environment, will allow the Minister to make a holistic decision on the planning and environmental components of the proposed development.

1.3.1 Objectives of the Notice of Intent

The objectives of the Notice of Intent are to:

- » Form an understanding of the extent of the site, and the fact that certain areas will require less environmental assessment than others
- » Obtain guidance on the specific further environmental actions that will be required, depending on land capability, and the flora and fauna unique to each development stage
- » Support the environmental assessment of each stage at subdivision application level, rather than rezoning – given the large size of the site, and varied character throughout.

1.4 The Project Proponent

The intended developer of Noonamah Ridge Estate is Intrapac Projects, an established and experienced property development company.

Formed in 1984 by Executive Chairman David Payes, Intrapac has built up a track record of nearly 30 years of creating high quality residential developments, with a focus on establishment of communities with a high level of amenity and strong civic cohesion.

Intrapac takes pride on taking a best practice approach to urban planning and environmentally sustainable design, in the recognition that their projects are differentiated through an appreciable display of quality.

Intrapac is a privately owned Australian company with the financial backing of a consortium of private investors, both companies and individuals. Partnerships with several of these core investors span more than 20 years, including the Smorgon family's Escor Group, which owns a 30 per cent

stake in Intrapac. This strong financial backing means Intrapac has the resources to commence and complete projects.

Intrapac Projects has been recognised for business success and excellence in property development by the property development industry's peak planning body, the Urban Development Institute of Australia's (UDIA) Excellence Awards:

- » 2008: The Quay
- » 2002: Lorikeet Ridge
- » 1997: Oaktree Rise
- » 1996: Churchill Park

Intrapac has a pipeline of land development projects, residential and industrial, throughout Eastern Australia. Current projects include:

- » Somerfield, Keysborough (VIC) – 1800 lot, masterplanned residential land estate
- » Meadow Springs, Truganina (VIC) – 160 residential lots
- » Pumicestone Park, Caboolture (QLD) – 130 residential lots
- » East Lansdale (WA) – 64 residential lots

Future projects include land holdings in Werribee (VIC), Bangholme (VIC), Park Ridge (QLD) and Ballina (NSW), amongst others.

Intrapac has achieved great success by adopting a hands-on approach to development. Intrapac's in-house team includes planners, financial analysts and acquisition managers. Intrapac also use a team of highly skilled consultants across Australia, some of whom have worked with Intrapac for more than 20 years.

Intrapac's approach to resourcing, along with this extensive network of consultants, means that Intrapac can handpick the team most suited to each of its projects. This agile approach contributes to the delivery of the best possible result every time. It also enables Intrapac to call on specialist skills when required and manage costs effectively, working with a range of consultants and experts in the fields of engineering, landscape architecture, environmental, geotechnical and heritage consulting, planning and traffic analysis.

1.5 The Project Team

The project team for Noonamah Ridge Estate comprises of the following consulting services:

1.5.1 Elton Consulting

Elton Consulting is a multi-disciplinary consultancy established in 1989, with offices in Darwin, Sydney and Canberra. We specialise in town planning projects, with a focus on customising our project approach to suit our client's needs. Elton Consulting provides professional and independent services to government, community and private sector clients, including statutory and strategic planning, social planning, sustainability, bid strategy development, policy, research, consultation, communications and community relations.

Elton Consulting's Northern Territory office was established in 2005 and our team of specialist planners have considerable experience in the Northern Territory urban, regional and remote planning and development context. Elton Consulting bring to projects our knowledge of the planning system and extensive experience in small, medium and large-scale projects.

Elton Consulting's town planning experience is broad and includes development of substantial strategic planning policies working alongside the Territory and Local Governments to deliver sustainable, integrated and viable planning policy, as well as working with public and private sector clients on rezoning and planning scheme amendments, development applications, planning proposals and other projects that will shape development in the future.

1.5.2 EcOz Environmental Services

EcOz Environmental Services is a fully locally owned and well-respected environmental consulting business providing services to industry, communities and government in northern, western and central Australia. The company has successfully operated across Northern Australia since it was established in Alice Springs in 1990.

EcOz provides a broad range of environmental services to a diverse range of local, national and international clients. Our speciality is to provide a complete environmental service to our clients.

EcOz works closely with our clients to provide rigorous and practical solutions to environmental problems whilst maintaining integrity in environmental practice.

Core areas of expertise:

- » Land Development and Subdivisions
- » Environmental and Social Impact Assessments and Approvals
- » Environmental Management, Planning, Systems, Monitoring and Auditing
- » Ecological, Flora and Fauna Baseline Studies; (Terrestrial and Aquatic)
- » Hydrogeology, Hydrology and Water Balances
- » Geochemistry, Acid Rock Drainage and Mine site Contamination
- » Community Consultation (including Indigenous stakeholders)
- » Community Benefit Programs and Environmental and other Offsets
- » Natural Resources, Soil and Land Management Investigations and Assessments

1.5.3 Byrne Design

Byrne Design was responsible for preliminary engineering assessment, and delivery of the infrastructure strategy and concept layout.

Byrne Design are Civil Engineering Consultants with a reputation for quality design and documentation. We focus on providing cost effective client focused engineering solutions along with exceptional service and response, keeping our clients informed from start to finish. Byrne Design has extensive experience in a broad range of Civil Works including:

- » Major and Minor Road works
- » Car parks
- » Local Area Traffic Management
- » Urban and Rural Subdivisions
- » Stormwater Drainage
- » Water and Sewerage infrastructure
- » Playing Fields / Ovals

- » Earthworks
- » Civil Works for Building Projects
- » Design and Construct Projects

1.5.4 **Fyfe Earth Partners**

Fyfe is a well-established land, resource and infrastructure development consultancy specialising in comprehensive engineering, planning and surveying services for land development, energy, mining and oil and gas industries across Australia.

Fyfe were responsible for the survey of the site, and aerial imagery.

2 The Study Area

This section outlines:

- » The site location, and regional context
- » The legal description and extent of the various land parcels

2.1 Site Locality

The proposed Noonamah Ridge Residential Estate is located in the rural hinterland of the greater Darwin region, approximately 36km south east of Darwin CBD, 37km from Darwin International airport, and 23km south east of Palmerston CBD. The Humpy Doo Local town Centre is located roughly 7km to the north west of the site, while the Noonamah tavern and service station are located 6km directly to the West on Stuart Highway. The location is illustrated by Figure 1, on overleaf.

Figure 1 Regional Context Plan

Source: Google Maps

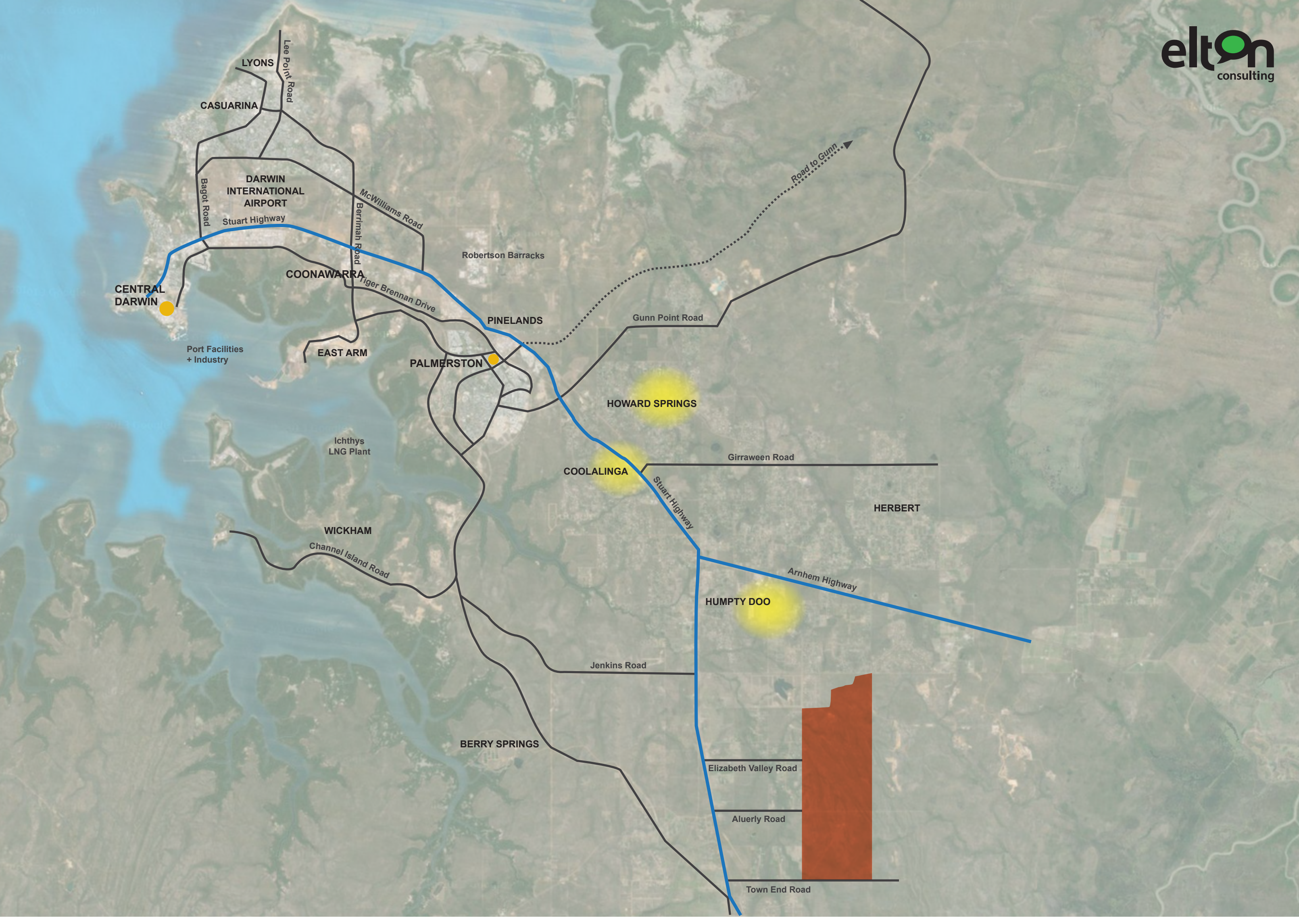
2.2 Site Details

The development proposal comprises three land parcels, outlined in Table 1, below.

Table 1 Site Details

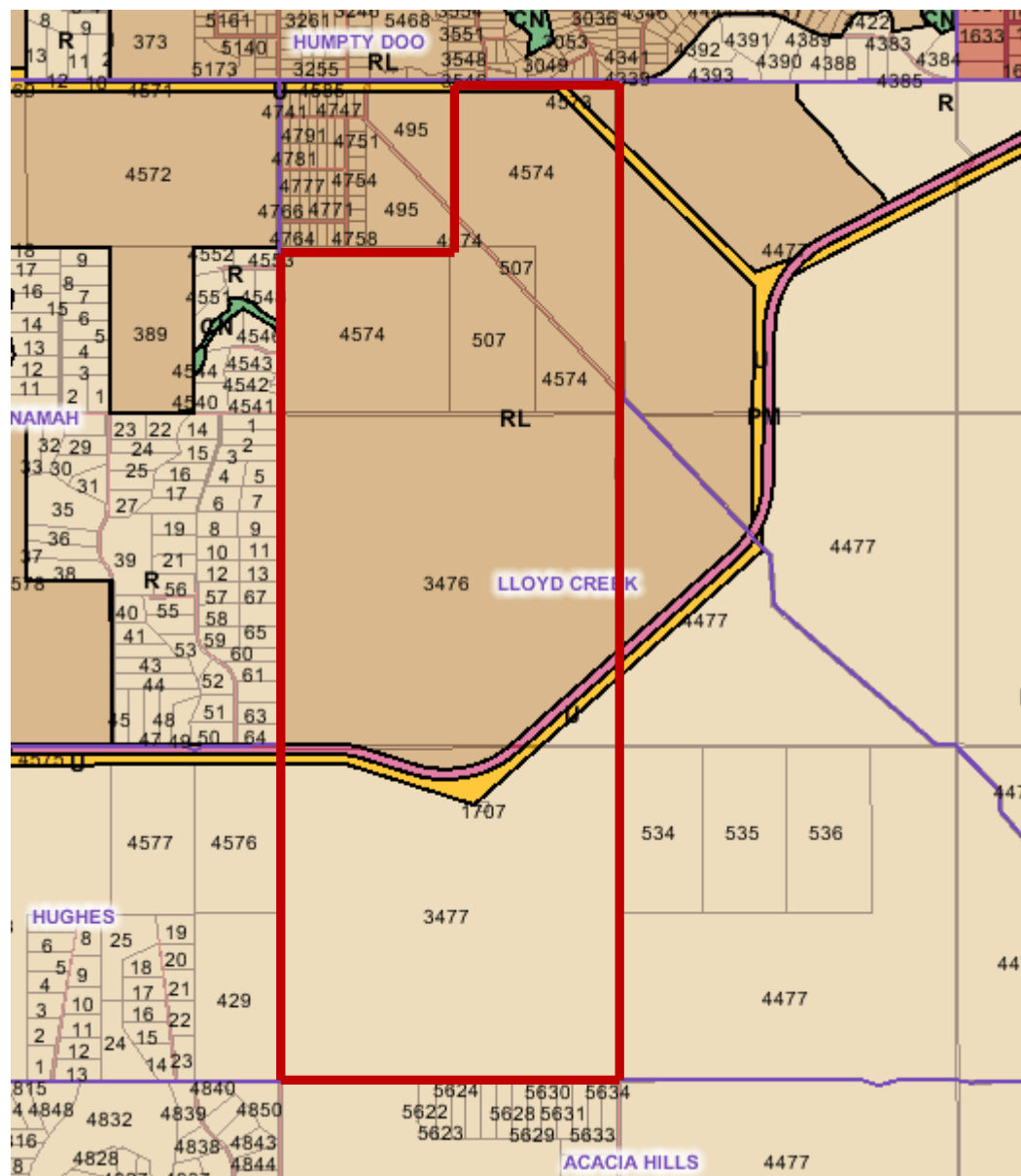
Registered Description	Section 4574, Hundred of Strangways	Section 3476, Hundred of Strangways	Section 3477, Hundred of Strangways
Address	655 Redcliffe Road, Lloyd Creek	905 Redcliffe Road, Lloyd Creek	1225 Redcliffe Road, Lloyd Creek
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Current Zoning	Rural Living	Multiple Zoning • Rural Living • Utilities • Main Road	Multiple Zoning • Rural • Rural Living • Utilities • Main Road
Local Government Area	Litchfield		
Current ownership	Koolpinyah Station Pty. Ltd.		

Source: NT Atlas and Spatial Directory



The zoning of the proposed development is outlined in Figure 2.

Figure 2 Current Zoning



NT Atlas and Spatial Directory

2.3 Market Demand

While the current Government, informed by the Northern Territory Planning Commission, is still developing the strategic plan for the Greater Darwin Region, there is substantial past work to provide direction for growth in the rural area of Darwin. Most notably, the idea of creating local village centres was first put forward in the 1980's, and is referenced in the CLP Discussion Paper released in 2012 which notes the establishment of a series of village centres at Humpty Doo, Berry Springs, Virginia and Howard Springs. The Litchfield Planning Concepts and Land Use Objectives recognises the need to maintain a rural atmosphere and accordingly lot sizes larger than 2ha is viewed as aspirational, anecdotal and market driven evidence exists to support the demand for smaller lots and diversity in housing choice in the rural area.

Further, as land within the current City of Palmerston reaches capacity, and land release in the eastern suburbs nears completion, the NT Government is looking towards the next chapter of Darwin's growth. The NT Government acknowledges the need for housing and employment both to house the current and future population. For years, Weddell has been the one area that the NT Government committed to with limited consideration of alternative options in other areas. While Weddell appears to be the logical extension of Palmerston, it is affected by a number of issues including high costs of infrastructure, flooding, midges, community services and amenity.

Due to these reasons, it is understood that the NT Government has not committed to Weddell at this time, but is rather working through a strategic process to consider other areas, and more importantly relying on the private sector to deliver housing.

The current proposal for Noonamah Ridge Estate responds to this, providing a real alternative to Weddell on land privately owned, highly suited to residential development with viable options to provide service infrastructure and with a high level of amenity.

PART B: THE DEVELOPMENT PROPOSAL

3 Development Outline

This section outlines:

- » The vision for the proposed development, and project yield
- » The unique opportunity represented by this site
- » The design philosophy that will inform the master planning of the residential estate
- » The various development components that will form part of the residential estate
- » The proposed rezoning and development process

3.1 Vision

The vision for the proposed residential subdivision is to:



Provide a high quality residential estate, providing a range of lot sizes and typologies, with an emphasis on retaining rural character and amenity. The estate will be serviced by a local town centre encouraging cohesion and social amenity, including the provision of land for a new primary school, retail facilities, a community centre and land for new volunteer fire brigades. The development will aim to connect to the surrounding rural area, providing the opportunity to create a strong sense of community.

3.1.1 Development Yield

It is envisaged that the development will yield in excess of **3,500 new residential opportunities** across the approximately 2,600ha of site area. The development will incorporate constrained land into larger lots and the open space network, as informed by land capability.

3.2 The Opportunity

The proposed development represents a substantial opportunity to deliver much needed residential expansion of the Greater Darwin Region through a coherent master planned approach.

The site is unique when compared to other sites investigated for residential expansion, including the Crown owned Weddell site, in that it is:

- » Held in private ownership in its entirety
- » Is a large property with the potential to make a substantial contribution to residential supply and social infrastructure in the region
- » Is well located with respect to road and transport infrastructure, with existing connections to Stuart Highway, and other local distributors
- » Contains two of the highest sites in the area, allowing for the placement of regional infrastructure including a new regional water reservoir facility at an optimal location
- » Comprises a gently undulating terrain, with natural fall to accommodate gravity fed water and sewer infrastructure

- » Comprises largely unconstrained land, with limited soil types prone to waterlogging or inundation, as compared to other sites in the region
- » Comprises significant natural features to enhance the amenity of a residential development
- » Is at a high elevation capturing prevailing breezes, on slopes that allow for design that will be climate responsive
- » Is not affected by biting insects
- » Is located in close proximity to an untapped natural water supply
- » Is well located with respect to the broader region, employment opportunities, and existing social and physical infrastructure

In short, the site is a logical starting point for the establishment of a new town in the rural Hinterland.

3.3 Design Philosophy

The design philosophy has been directly informed and framed by:

- » The desire to **maintain a rural character**, and provide alternative lot sizes and types within a rural setting
- » The existing **land capability** across the site, and the opportunities the variety of environmental features present in the creation of a high quality rural community.

These two primary points will be achieved by implementing the following:



Lot size and density will be determined by land capability

- » Smaller lot sizes will be placed on land with higher land capability, and better draining soils
- » Smaller lot sizes will be well located in relation to the local town centre, social and community facilities
- » Larger lots will be placed on areas of constrained land, including areas with greater slope and poorly draining soils – in accordance with the current provisions of the NT Planning Scheme.



Lot sizes and typologies will be interspersed

- » The intention is that lot sizes will be integrated with each other, rather than segregated into distinct areas of local density.
- » The design will accommodate a mix of lot sizes interspersed with each other to create a diverse built form, and strengthen the rural character of the development
- » This may mean 800m² adjacent to 2000m² lots, and further interspersed with lots of 4000m², 8ha, 2ha, and so forth. This will be determined by land capability, particularly in cases where poorly drained and well-drained soils are found in close proximity to each other.



Roads will follow the natural landscape

- » Roads will be designed to follow the natural topography, following ridge lines to avoid unnecessary cut and fill, as well as erosion
- » Creek crossings will be minimised to ensure limited impact on existing stormwater flow and runoff
- » Roads will meander creating interest in the environment, encouraging slow vehicle speeds, and allow for a sense of discovery unparalleled in the existing rural environment
- » The layout will involve a blend of rural and urban subdivision standards, to the satisfaction of Litchfield Council, aimed at retaining a rural character.



Natural features will be celebrated and enhanced

- » Natural features, such as creeks, billabongs and areas of poorly drained soils will be incorporated into an integrated open space network, preserving ecological corridors and providing amenity for residents
- » Certain areas will be enhanced to incorporate active recreation spaces such as ovals attached to the school, areas to picnic, and areas for social gatherings and community events
- » An extensive network of pedestrian paths and cycle tracks will be developed through the open space system, allowing the broader community to enjoy the unique natural environment
- » The open space system will be designed to maintain natural stormwater flow, and manage additional stormwater generated through the development of the site.



A local town centre will be the soul of the community

- » A local town centre will be located to take advantage of existing road connections, and accessibility to the surrounding residential area
- » The local town centre will comprise outwardly focused buildings, interacting with a high quality local town square, the open space network and will incorporate a natural feature such as a creek or natural wetland to create amenity for residents
- » The local town centre will be master planned to ensure a rural ambience through high quality architecture, an appropriate mix of uses and interesting landscaping
- » Community facilities, including a possible school will interact with active and passive open space, as well as well-designed retail spaces, creating an environment where residents come together, interact and undertake community activities



The estate will integrate with the surrounding community

- » The site will be accessible by public transport, as well as the existing good road connections to the Stuart Highway, as well as other local distributors
- » Road layout will focus on a good distribution of traffic, allowing for new residents to easily access the Stuart Highway, and onward destination

- » Road layout will also integrate surrounding rural areas into the development, allowing existing residents to utilise the new local town centre, public spaces and enjoy the sense of community
- » Public transport will be expanded into the development, along with a potential new park and ride facility



The development will be an environmentally sensitive and healthy environment

- » Cycle paths will be provided in road reserves and open space, along with an expansive network of pedestrian paths to encourage a healthy lifestyle
- » A range of recreation facilities, including new ovals and opportunities for the establishment of sports clubs will be provided in well thought-out locations
- » The layout will respond to the natural environment, with restrictions on pesticides and other nutrients that have the potential to disrupt natural eco-systems
- » The site will not be “strip-cleared” during construction. Vegetation will only be removed where required for the construction of roads, and installation of services. Individual owners will therefore have the opportunity to retain existing vegetation when constructing new dwellings and establishing gardens.

3.4 Development Components

3.4.1 Local Town Centre & Community Facilities

A local town centre will be established to serve both the residents of the proposed Noonamah Ridge Estate, as well as the broader community within the wider rural area. The Town centre will provide the heart and soul of the development with a clear architectural vernacular reinforced through a master plan approach. The size of the local town centre will be determined through sound market analysis, and informed by the Greater Darwin Regional Land Use Strategy’s proposed hierarchy of activity centres.

Opportunities for retail and commercial space, including the creation of coffee shops and restaurants to serve as a gathering place for locals, to stimulate a sense of community and social cohesion.

The town centre will be structured around a community square, connected to the open space network and recreation spaces. It will provide for al fresco dining in a well treed and shaded space, with a high aesthetic quality and amenity.

Land will be set aside to provide for a new primary school, as the community grows, with ovals and sporting facilities incorporated into the open space network. Provision will also be made for a fire service site, and other community facilities such as day care and a venue for use by local community groups, societies and clubs.

3.4.2 Residential Allotments

A range of residential allotments will be provided, designed to fit in with the basic residential zones in the Northern Territory Planning scheme. These will include lots that range from 800m², up to 8ha as determined by land capability. These lot types could include:

- » Single Dwelling Residential

- » Multiple Dwelling Residential
- » Rural Residential
- » Rural Living
- » Rural

It is not envisaged that Medium Density Residential zones or High Density Residential zones would be provided.

This will provide the opportunity for residents to live within a rural character development, with a diversity in lot sizes that provides for greater choice in lifestyle and affordability. It will also allow existing residents to move onto a property suited to their stage in life, without needing to leave the rural area and their support networks entirely. For example, this could be first homebuyers, or existing residents downsizing to a smaller property as family needs dictate.

3.4.3 Open Space Network & Environmental Features

An integrated open space network will be provided across the site allowing for the incorporation of existing natural features, stormwater flow and ecological corridors into the development. Certain areas will be retained in their natural state, while others will form part of active and passive recreation facilities.

Areas will be created for the enjoyment of residents of the broader Darwin Region, incorporating swimming holes, picnic areas, walking trails and cycle trails. This will add to the broader integration of the residential estate into the existing rural area.

3.5 Site-planning Requirements

3.5.1 Building Envelopes

Central to the success of the development will be site-planning requirements to be placed on certain lots, currently envisaged to be those between 800m² and 3999m². These site-planning requirements will provide a pre-defined building envelope for individual houses, allowing the developer to masterplan the position of houses on various properties. This will allow buildings to be staggered and positioned in a manner to retain the existing rural character with space around buildings, and privacy for private recreation areas. Particularly this will be used to create space between dwellings on smaller lots that abut those on larger lots.

3.5.2 Site Clearing

Individual properties will not be strip-cleared during the construction of the roads and installation of services. Individual owners will be encouraged through the building envelope controls to retain as much native vegetation as is practically possible, specifically mature trees and natural rocky outcrops.

The intention is to minimise impact on the natural topography and to assist in erosion and sediment control.

3.5.3 Architectural Design Guidelines

Architectural design guidelines to support sales contracts will be developed to ensure a cohesive character, with a strong focus on retaining the rural character, and being climate responsive.

The architectural guidelines will include orientation of private open space in relation to neighbours, acoustic provisions and screening of water tanks, air conditioners and solar panels.

Landscaping requirements will be provided to include the use of indigenous plants, and the extent of landscaping required on completion of dwellings to ensure the rural character is regained as fast as possible.

It is the intention of the developer to create an on-site nursery at which to store rescued plant species, which can be reintroduced into individual gardens, as well as open space, road verges and nature strips.

4 Proposed Rezoning & Development Process

This section outlines:

- » The proposed planning processes following assessment of the Significant Development Proposal and the Notice of Intent
- » The intended timing of lodgement of the application

4.1 Proposed Planning Process

To facilitate the logical and expedited delivery of housing land in the Darwin Region, we proposed the following process on completion of assessment of the **Significant Development Proposal** and **Notice of Intent**.

4.1.1 Planning Scheme Amendments

The land is currently located in Zone RL (Rural Living) and Zone R (Rural) which only allows for large residential lots under the Northern Territory Planning Scheme. The planning scheme amendments detailed below will enable the creation of residential lots with a variety of sizes to meet market demand, and provide prospective purchases with an alternative not currently provided in a rural setting. The smaller lots will also help alleviate the existing housing shortage, and assist in addressing housing affordability.

Following assessment of the simultaneous Significant Development Proposal and Notice of Intent, we are proposing to lodge an application for **Planning Scheme Amendment** to:

- » Amend the Darwin Region Land Use Framework, if required
- » Introduce an **Area Plan** across the site, including key development principles
- » Introduce a **Specific Use Zone** to provide certainty on development parameters, subdivision layout and detailed environmental assessments

The purpose of the rezoning to SU (Specific Use Zone) is to allow facilitate the creation of a mix of residential development with ancillary activities such as open space, a community centre, a school and other community facilities. The specific use zone will incorporate the environmental assessment requirements recommended by the Environment Protection Authority in response to the Notice of Intent, as they relate to various land types and sections of the site. The assumption is that the same level of environment assessment will not be required across the whole site, and that this can be controlled through the Specific Use Zone, and implement on a stage-by-stage basis.

A draft indicative Area Plan has been prepared in support of the Significant Development Proposal, demonstrating the desired form of development that will arise as a result of the proposal. The draft indicative master plan will be refined during the process up until the submission of a sequence of subdivision development applications, so that comments from the

community and government may be incorporated into the final design. The draft indicative Area Plan is available in Appendix A.

- » Introduce a concept masterplan linked to the Specific Use Zone, to a finer detail than the area plan, to provide guidance to assessing subdivision plans, and to outline key development components.

4.1.2 Subdivision Applications

Subdivision application will be undertaken on a staged basis across the site, with the size of each stage, and number of proposed allotments directly informed by market demand and feasibility assessments.

It is envisaged that the stage 1 subdivision application will be lodged simultaneous to the rezoning application, in accordance with the recent amendments to the Planning Act.

The subdivision applications will take into account the specific use zone, and directed by land capability. The advice received from the Environment Protection Authority in response to the Notice of Intent will determine the specialist studies required in each instance.

4.1.3 Normalisation of Lot Zoning

Following approval of subdivision application, and consequent construction of the physical infrastructure, we propose undertake a process of normalising the individual lot zonings from the Specific Use Zone to the relevant zone under the Northern Territory Planning Scheme.

This is to ensure that the development falls within the Northern Territory Planning Scheme itself, ensuring less complexity in the ongoing land use management of the development in the future.

4.2 Timing

The project proposal provides a real alternative to the delivery of a new town in the Greater Darwin Region given that the City of Weddell is not currently in the development pipeline. Given current market pressures, and the need to deliver Greenfield land, Intrapac Projects intends actively pursuing and expedited planning process.

At this stage, it is the intention to lodge the Planning Scheme Amendment, including the rezoning application, by late **March 2014**, pending the outcome of the simultaneous Significant Development Proposal and the Notice of Intent. We will work with the Minister for Lands, Planning and the Environment, the NT Planning Commission and the NT EPA to assist in any way possible with the assessment of this proposal.

4.2.1 Ministerial Delegation to the Department of Lands, Planning & the Environment

To assist with the expedited processing of the Planning Scheme Amendment, it is requested that as a component of the Significant Development Proposal assessment, the Minister for Lands, Planning and the Environment grant delegation to the Department of Lands, Planning and the Environment to place the Planning Scheme Amendment on Public Exhibition, without first referring the matter back to the Minister under Section 13(2) of the Planning Act.

PART C: TECHNICAL DISCUSSION

5 Assessment against Relevant Legislation and Strategies

5.1 Commonwealth Legislation

5.1.1 Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act is the Australian Government's principal piece of environmental legislation. It provides protection for matters of National Environmental Significance and regulates certain activities concerning wildlife trade, heritage and areas owned or controlled by the Commonwealth Government.

The EPBC Act can be 'triggered' by certain activities outlined by the Act. The general rule is that actions that are likely to have a significant impact on a matter protected under Part 3 of the Act must be referred to the Minister for a decision on whether an environmental impact assessment is required.

The matters protected under Part 3 of the EPBC Act can be divided into two categories:

- » Matters of National Environmental Significance; and
- » Proposals involving the Commonwealth.

Matters of National Environmental Significance include:

- » The world heritage values of declared World Heritage properties;
- » The heritage values of National Heritage places;
- » The ecological character of declared Ramsar wetlands;
- » Threatened species and ecological communities listed under the EPBC Act (except 'extinct' and 'conservation dependent' species, and 'vulnerable' ecological communities);
- » Migratory species listed under the EPBC Act;
- » Nuclear actions that are likely to have a significant impact on the environment; and
- » The Commonwealth marine environment (3-200 nautical miles off shore).

Proposals involving the Commonwealth include actions that are:

- » Carried out on Commonwealth land that are likely to have a significant impact on the environment anywhere;
- » Taken outside Commonwealth land that are likely to have a significant impact on the environment on Commonwealth land;
- » Undertaken by the Commonwealth or a Commonwealth agency anywhere in the world that are likely to have a significant impact on the environment anywhere; and
- » Likely to have a significant impact on the Commonwealth heritage values of a place listed on the Commonwealth Heritage List.

Assessment and justification against the proposed Significant Development Proposal – EPBC Act

Assessment under the EPBC Act has been undertaken by EcOz Consulting, and the outcome will be forwarded to the Minister for Lands, Planning and the Environment and the NT Planning commission as soon as this is available.

5.1.2 Heritage Conservation Act 1991

The Northern Territory contains a rich and diverse range of Aboriginal cultural heritage places, many of which are highly significant to contemporary Aboriginal culture.

The Heritage Conservation Act 1991 seeks to conserve these places by providing a system for the identification, assessment, recording, conservation and protection of places and objects of prehistoric, protohistoric, historic, social, aesthetic or scientific value, including geological structures, fossils, archaeological sites, ruins, buildings, gardens, landscapes, coastlines and plant and animal communities or ecosystems of the Northern Territory.

Under the terms of the Heritage Conservation Act 1991:

‘Archaeological object’ means a relic pertaining to the past occupation by Aboriginal or Macassan people of any part of Australia which is now in the Northern Territory, being:

- i. An artefact or thing of any material given shape to by man;
- ii. A natural portable object of any material sacred according to Aboriginal tradition;
- iii. Human or animal skeleton remains; or
- iv. Such objects, or objects of a class of objects, as are prescribed; but does not include an artefact made for the purposes of sale or an object, or objects of a class of objects, excluded by the Regulations from the ambit of this definition.

‘Archaeological place’ means a place pertaining to the past occupation by Aboriginal or Macassan people that has been modified by the activity of such people and in or on which the evidence of such activity exists, and includes such places, or place of a class of places, as are prescribed, but does not include a place, or a place of a class of places, excluded by the Regulations from the ambit of this definition.

Assessment and justification against the proposed Significant Development Proposal – Heritage Conservation Act 1991

There are no declared places or objects listed in the Northern Territory Heritage Register located on the subject land.

5.2 Territory legislation

5.2.1 Northern Territory Planning Act

Amending the Northern Territory Planning Scheme

This application proposes an amendment to the Northern Territory Planning Scheme in accordance with Clauses 11 and 13 of the Northern Territory Planning Act, as detailed below:

11 Amendment of planning scheme generally

- (1) The Minister may amend a planning scheme in accordance with this Part.
- (2) To avoid doubt, the repeal and substitution of a planning scheme in its entirety is an amendment of the planning scheme.
- (3) The Minister may declare in writing that, in the Minister's opinion, a class of amendments of a planning scheme is not so significant as to require exhibition.

13 Request for amendment of planning scheme

- (1) A person or body may, in writing, request the Minister to amend a planning scheme as proposed in the request.
- (2) After considering the request, the Minister may:
 - (a) if the Minister is satisfied the proposed amendment is within a declared class of amendments or is not so significant as to require exhibition:
 - (i) decide to amend the planning scheme without taking any further action under Division 3, 4 or 5;
 - (ii) amend the planning scheme as proposed;
 - (iii) give notice of the amendment in accordance with section 28; and
 - (iv) provide reasons for the amendment in accordance with section 29;
 - (b) decide to continue consideration of the proposed amendment by placing it on exhibition; or
 - (c) As soon as practicable after making the decision, the Minister must give written notice of the decision to the person or body who requested the proposed amendment.
- (4) If the Minister decides to refuse to amend the planning scheme as proposed, the notice of the decision must include the reasons for the refusal.

Exhibition of the proposed Northern Territory Planning Scheme amendment

It is requested that the proposal be exhibited for a period of 28 days, in accordance with Clause 15(1) of the Northern Territory Planning Scheme. Given that extensive consultation with a broad sector of the community, business representatives and government agencies has been undertaken prior to lodgement of the proposed planning scheme amendment, a longer period of exhibition is not considered necessary.

15 Period of exhibition of proposal

- (1) Subject to subsection (2), the period of exhibition for a proposal is 28 days starting on the day the notice of the proposal is first published in a newspaper under section 17.
- (2) The Minister may determine a longer period of exhibition for a particular proposal or class of proposals.

5.2.2 Assessment and justification against the proposed rezoning – Northern Territory Planning Act

In accordance with Clause 13(1) of the Northern Territory Planning Act, this application comprises a request to the Minister to provide strategic direction in anticipation of a proposed amendment to

the Northern Territory Planning Scheme, supporting the proposed rezoning of the subject land from Zone R (Rural) and RL (Rural Living) to a Specific Use Zone.

5.2.3 Assessment Against Additional Northern Territory Policies

Following completion of the Significant Development Application, the subsequent Planning Scheme Amendment application will be assessed against:

- » The Draft Greater Darwin Regional Land Use Strategy
- » The Northern Territory Planning Scheme
- » The Territory 2030 Strategic Plan
- » The Northern Territory Climate Change Policy, 2009
- » The Draft Darwin Harbour Regional Management Strategic Framework 2009 – 2013
- » The Draft Darwin Harbour Regional Management Strategic Framework 2009 – 2013.
- » The Litchfield Planning Concepts and Objectives

5.3 Summary & Implications

It is clear from the discussion of current policy and legislation that:

- » Due consideration has been given to the relevant Commonwealth and Territory Legislation
- » The development of the Planning Scheme Amendment Application which will follow the Significant Development Proposal, will take due consideration of relevant legislation and policies
- » There are not legislative or policy provision that are deemed to impede the proposed development, outside of standard administrative arrangements.

6 Social & Economic Investigations

A broad investigation has been undertaken to assess the current social and economic character of the Noonamah Area, as well as a comparison with the character of Palmerston and the broader Litchfield administrative area.

6.1 Demographic Analysis

A demographic analysis has been undertaken utilising data available from the Australian Bureau of Statistics 2011 Census of the population residing within the project site. To ensure a sound analysis of the existing population, data has been retrieved for the state suburb of Noonamah, the Local Government Area (LGA) of Litchfield and the LGA of Palmerston to provide an effective benchmark for comparison. A number of key characteristics have been identified. These are outlined in Table 2 below:

Table 2 Demographic Makeup of Noonamah Region

Indicator	Noonamah	%	Litchfield	%	Palmerston	%
Population	528	-	18996	-	27700	-
Age groups (%)						
0-4	42	8.0	1189	6.3	2842	10.3
5 -11	57	10.8	1961	10.3	3322	12.0
12-17	36	6.8	1716	9.0	2470	8.9
18 - 24	41	7.8	1966	10.3	3130	11.3
25-54	239	45.3	8580	45.2	12997	46.9
55 - 64	83	15.7	2321	12.2	1872	6.8
65 and over	30	5.7	1263	6.6	1067	3.9
Family structure (%)						
Couples with children	52	47.7	2166	47.8	3479	49.7
Couples without children	37	33.9	1740	38.4	2164	30.9
Single parent families	20	18.3	579	12.8	1264	18.1
Other family	0	0	49	1.1	93	1.3
Household type (total)						
Family household	104	78.8	4346	77.9	6821	77.4
Lone person	25	18.9	1046	18.7	1545	17.5
Group household	3	2.3	187	3.4	449	5.1
Average household size (no. people)	2.8	-	2.8	-	2.9	-
Cultural diversity (%)						

Indicator	Noonamah	%	Litchfield	%	Palmerston	%
Aboriginal or TSI heritage	55	10.4	1357	7.1	3082	11.1
Born overseas	48	9.1	2329	12.3	4210	15.2
Ancestry (top 3)	-	Australian (30) English (17.9) Scottish (7.1)	-	Australian (31.2) English (25.5) Irish (7.2)	-	Australian (31.5) English (24.9) Irish (6.7%)
Speaks language other than English at home	14	10.9	482	8.6	1120	13.8
Income (\$)						
Median household income	1465	-	1767	-	1814	-
Household income less than \$600	18	13.7	682	12.2	923	10.5
Employment (people who are in the labour force)						
Employed full-time	157	67.7	7001	68.6	10439	70.6
Employed part-time	47	20.3	2012	19.7	2616	17.7
Unemployed (%)	11	4.7	344	3.4	546	3.7
Education level (people over the age of 15 years)						
University qualification	15	3.6	2454	16.4	3720	18.3
Certificate qualification (tafe etc.)	62	15	3766	25.1	5133	25.3
Housing types (%)						
House	109	84.5	4797	86	6802	77.1
Semi-detached house	0	0	216	3.9	948	10.8
Apartment	0	0	90	1.6	1012	11.5
Other	20	15.5	463	8.3	45	0.5
Housing tenure (%)						
Fully owned	33	25.4	1584	28.4	737	8.4
Being purchased	59	45.4	2794	50.1	3718	42.2
Rented	25	19.2	1015	18.2	4138	46.9
Other / not stated	4	3.1	48	0.9	27	0.3

The information contained in the above table is explored more fully below.

Age

- » A smaller proportion (17.6%) of the population within Noonamah is aged between 5-17 years compared with Litchfield (19.3%) and Palmerston (20.9%).

- » A smaller proportion (7.8%) of the population within Noonamah is aged 18-24 years compared with Litchfield (10.3%) and Palmerston (11.3%).
- » A large proportion (15.7%) of the population within Noonamah is aged 55-64 years compared with Litchfield (12.2%) and Palmerston (6.8%).

Family Structure

- » Noonamah exhibits a similar proportion (47.7%) of households comprising couples with children to Litchfield (47.8%) and Palmerston (49.7%).
- » The proportion of households within Noonamah comprised of couples without children is slightly lower (33.9%) than Litchfield (38.4%), and slightly higher than Palmerston (30.9%).
- » Noonamah exhibits a higher proportion (18.3%) of households comprising single parent families than Litchfield (12.8%); however, the figure is comparable with Palmerston (18.1%).

Household Type

- » The proportion of family (78.8%), lone person (18.9%) and group households (2.3%) in Noonamah is comparable to Litchfield (77.9%, 18.7% and 3.4% respectively) and Palmerston (77.4%, 17.5% and 5.1% respectively).

Cultural Diversity

- » Noonamah illustrates a slightly higher proportion (10.4%) of people with aboriginal or Torres Strait Islander (TSI) heritage compared with Litchfield (7.1%), however the figure is comparable with Palmerston (11.1%).
- » Noonamah (9.1%), Litchfield (12.3%) and Palmerston (15.2%) all exhibit a small proportion of the population who were born outside of Australia. Notwithstanding this fact, all areas exhibit an identifiable level cultural diversity through analysis of ancestry. Noonamah exhibited high proportions of people with English ancestry (17.9%) and Scottish ancestry (7.1%). Palmerston similarly exhibited a high proportion (25.5%) of the population with English ancestry, while the second most common ancestry was that of Irish descent (7.2%).

Income

- » Noonamah exhibits a relatively low (\$1465) median household income compared with Litchfield (\$1767) and Palmerston (\$1814). Correlating with this trend, Noonamah exhibits a slightly higher proportion (13.7%) of households earning less than \$600 a week compared with Litchfield (12.2%) and Palmerston (10.5%).

Employment

- » Labour force characteristics within Noonamah are relatively similar to that of Litchfield and Palmerston. There are no major differences between the proportion of the population in each area who work full time, part time or who are unemployed.

Education

- » An analysis of educational attainment for the study area suggests that the population has relatively low levels of post school education. Noonamah exhibited low levels of people aged 15 years and over with a university education (3.6%) compared with Litchfield (16.4%) and Palmerston. Similarly, Noonamah also exhibited low levels (15%) of people aged 15 years and over with a certificate qualification compared with Litchfield (25.1%) and Palmerston (25.3%).

Housing types and tenure

- » Noonamah illustrates very high levels (84.5%) of separate houses compared with Palmerston (77.1%), however the proportion is comparable to Litchfield (86%). Correlating with this trend, Noonamah has no semi-detached houses (0%), which although similar to Litchfield (3.9%), is

significantly lower than Palmerston (10.8%). This trend is similar when considering the presence of apartments within the study area. Noonamah has no apartments (0%), and although comparable with Litchfield (1.6%), this figure is significantly lower than Palmerston (11.5%). These figures reinforce the existing rural and low-density and rural character of the area in which the project area is located.

- » Noonamah exhibits a comparable proportion (25.4%) of households which are fully owned compared to Litchfield, however the proportion is much higher than that of Palmerston (8.4%).
- » Although a slight differentiation, Noonamah generally exhibits similar proportions (45.4%) of households being purchased compared with Litchfield (50.1%) and Palmerston (42.2%).
- » Noonamah exhibits a similar proportion (19.2%) of households that are being rented to Litchfield (18.2%); however, the proportion is significantly lower than that of Palmerston (46.9%). This may indicate a high proportion in Palmerston rather than an abnormally low proportion in Noonamah.

6.1.1 Existing Social Facilities

The broader Noonamah area is serviced by limited social and community infrastructure, particularly limited opportunities for schooling and day care.

While some community facilities and community halls are provided, these are considered to be lacking even in servicing the needs of existing residents.

Existing social infrastructure is outlined in the plan on overleaf.

The proposed development of Noonamah Ridge Estate provides the opportunity to supplement these facilities through the provision of:

- » The site for a future school
- » Community halls and meeting places
- » Additional opportunity for recreation
- » Additional infrastructure for fire fighting

Figure 3 Existing Social Infrastructure in the Broader Noonamah Region

Noonamah Community Facilities

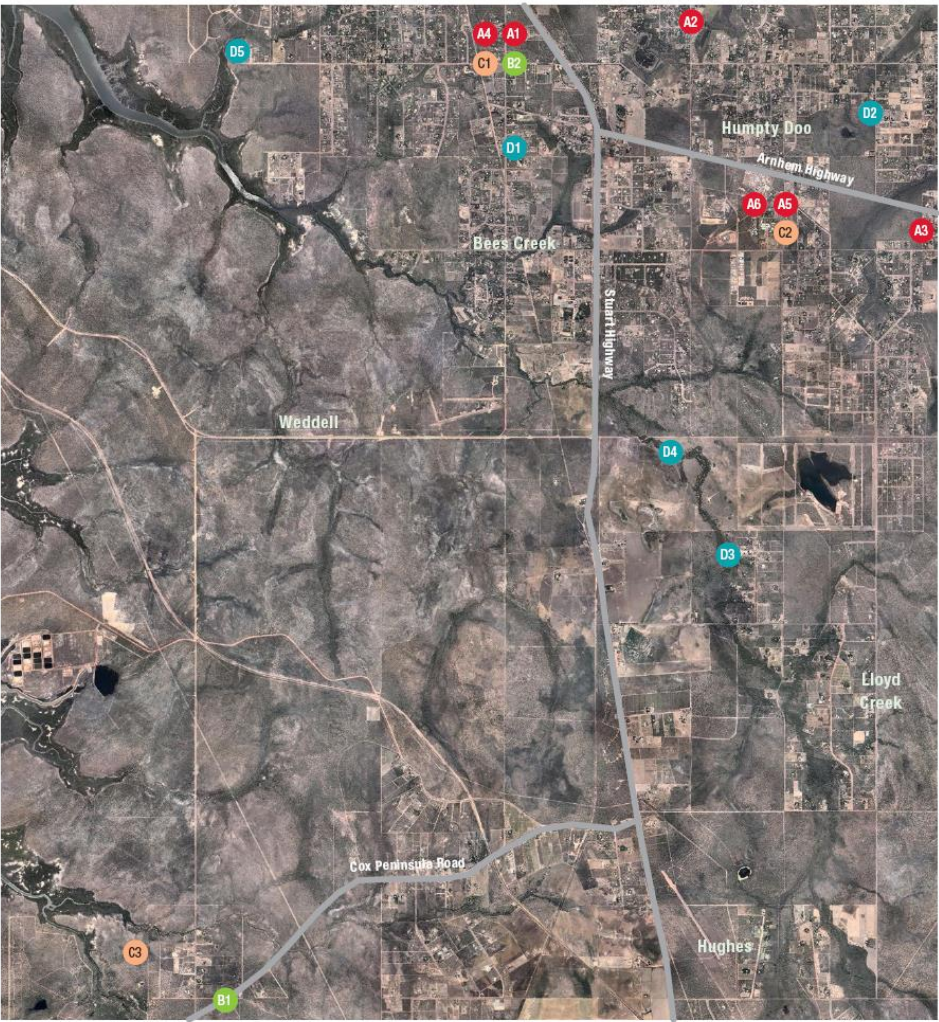
- SCHOOLS**

 - A1 Bees Creek Primary School (Transition to year 6)
 - A2 Girraween Primary School (Transition to year 6)
 - A3 Maparu Christian School (Pre-school to year 10)
 - A4 Sattler Christian College (Transition to year 9)
 - A5 Taminin High School (Year 7 to year 10)
 - A6 St Francis of Assisi School (Transition to year 6)
- CHILD CARE AND PRE-SCHOOL FACILITIES**

 - B1 Berry Springs Pre-School
 - B2 Goodstart Early Learning
- COMMUNITY FACILITIES**

 - C1 Freds Pass Sport and Recreation Reserve
 - C2 Humpty Doo Village Green
 - C3 Berry Springs Recreation Reserve
- EMERGENCY SERVICES**

 - D1 Bees Creek Volunteer Fire Station
 - D2 Koolpinyah Volunteer Fire Station
 - D3 Elizabeth Valley Volunteer Bush Fire Brigade
 - D4 Livingston Volunteer Bush Fire Brigade
 - D5 Virginia Volunteer Fire Station



6.2 Housing Diversity

A key element in developing a socially sustainable community is ensuring the provision of housing that meets the needs of a diverse range of households. The draft indicative master plan proposes a variety of housing on the site that provides different housing types and affordability. This responds to the social and economic analysis discussed under Section 6.1.

6.2.1 Proposed lot sizes and densities

The proposed development will incorporate a full range of lot sizes and density, as ordinarily provided for within the NT Planning Scheme. This will include lots that range from 800m² to 8ha. Lot density will be determined by land capability.

6.2.2 Proposed minimum setbacks and building envelope requirements

To maintain the rural character of the area, individual properties will be accompanied by building envelope and setback plans. Particularly in the case of smaller lots this will assist in maintaining the rural character of the proposed subdivisions.

6.2.3 Design guidelines

Once the site is rezoned, and as part of the development application process, extensive design guidelines will be finalised and implemented for development occurring within the site. These guidelines will form part of the mandatory design and construction covenants that must be complied with for development within the new residential community. The following provide some of the principles to be addressed in greater detail by the design guidelines:

- » Being sympathetic and complementary to surrounding existing Rural Living allotments;
- » Creating a pleasing streetscape environment;
- » Designing for cross ventilation, orienting habitable living rooms and outdoor living spaces appropriately in terms of solar accessibility;
- » Selecting and locating native species for landscaping on individual sites;
- » Minimising appearance of on-site parking;
- » Ensuring privacy on individual lots through carefully designing outdoor spaces;
- » Supporting a sustainable community through efficient utility investments and housing design; and
- » Promoting high quality architecture that reflects and takes advantage of the region's unique climate.

6.3 Summary & Implications of the Social & Economic Analysis

The above social and economic analysis demonstrates that:

- » The broad population in the Noonamah and Litchfield region reflects the population trends in Palmerston, with a growing population and combination of young families and ageing population
- » This trend will continue to place pressures on the need for improved schooling and the provision of social infrastructure, including provision for housing typologies suited to the ageing population
- » As the current young families matures there will be the need for a lifecycle of housing, with the ability for home-leavers to enter the residential market within their community
- » Similarly, the ageing population will require residential opportunities within the community that allows for downsizing, without the need to relocate in entirety

The above, along with the housing analysis and diversity discussed under section 6.2 will contribute to:

- » Creating improved access to a range of housing types in the Noonamah region
- » Provide an affordable alternative to entering the market in the rural area
- » Provide an alternative to living in the rural area, for those in search of the rural lifestyle but without the resources to maintain a large rural property
- » Allow residents to move through a range of housing types, depending on stage of life.

7 Infrastructure Capacity Investigations

An assessment of the access and transportation issues was undertaken to inform the future development of the site.

7.1 Traffic Assessment

7.1.1 Site context

The Noonamah Development is located within the Lichfield Council Municipality. The main access to the site is from the west via Stuart Hwy and from the north via Arnhem Hwy. The area around the development is mainly rural subdivisions with large lots and wide roads with minimum traffic.

7.1.2 Existing road network

Redcliffe Rd is a two-way two-lane sealed functioning as a collector road, which runs along the east boundary of the property from north to south and connects to the Arnhem Hwy to the north.

Goode Rd is a two-way two-lane sealed road from Redcliffe Rd to the east with no connection to the west.

Elizabeth Valley Rd is two-way two-lane sealed functioning as a collector road running in the east-west direction from the Stuart Hwy to the eastern boundary of the development. The connection with the Stuart Hwy is a channelised intersection.

Alverly Rd is an unsealed track that passes through the development in the east-west direction. Outside the development it is a sealed road from Redcliffe Rd to the Stuart Hwy, there is currently no formalised access from Alverly Rd to the Stuart Hwy.

Townend Rd is a two-way two-lane sealed road running in the east west direction at the southern end of the development with access to the Stuart Hwy via a T intersection.

7.1.3 Future external works

The future road network for roads in the vicinity of the development site can be determined from the following two strategic plans:

- » The Greater Darwin Plan and its associated Litchfield Concept Plan; and
- » The Noonamah Area Plan (Preliminary Draft for Discussion) contained within the Rural Local town Development Discussion Paper

Alverly Rd reserve is a 100m wide corridor that crosses the site connecting Stuart Hwy with Arnhem Hwy. Along the reserve there is also a 100m utility corridor, which is expected to accommodate gas, power and water infrastructure. Both reserves have been combined into a 200m wide corridor. As traffic increases in the area and in the long term Alverly Rd is expected to become a heavy vehicle arterial road between the two highways.

Goode Rd reserve is a 60 meter road reserve, which is identified as a possible road network connector between Stuart Highway and Arnhem Highway in the future.

The layout of the development and its connections with the existing road network is consistent with the road networks shown in the Greater Darwin Plan and Noonamah Area Plan. The Traffic Assessment concludes that the external road system will be suitable, safe and appropriate to cater for traffic to and from the new residential estate and that there will not be any unsatisfactory road capacity or traffic related implications due to the new development.

7.1.4 Anticipated internal road network

Vehicular traffic on site will be supported by a new internal road network arranged to maximise travel interconnectivity within the site and to provide safe access to the existing and proposed Arterial and Collector roads. Internal roads will be constructed to give the area rural attractiveness incorporating swales, silt traps and other drainage features; localised areas with small lots will require different road treatment with the incorporation of kerbs and asphalt pavement. Proposed example cross sections are provided in Appendix A: Drawing Set (drawings 1315-SK03&04).

One of the key objectives on the project is to provide an environment to discourage speeding on the roads and keep the operating speed between 60 and 80 Kph depending on the road classification; this will be achieved by limiting the length of straight roads, narrowing cross sections, staggering intersections and the incorporation of traffic calming features.

Impact on existing road network

Based on the provision of 3,500 dwellings, the development is expected to generate approximately 23,700 trips per day, 1,860 trips in the morning peak hour and 2,400 trips in the afternoon peak hour. 88% of journey to work trips are expected to be by car and 2.5% by public transport (i.e. bus). This is based on the latest census data for the Litchfield and Greater Darwin areas. A preliminary assessment of forecast trips is provided in Appendix B: Expected Traffic Generation. Not all of this traffic will be external to the development site. The extent of external traffic cannot be determined until the nature, location and size of internal attractors and generators such as shops and schools has been determined.

7.1.5 Public transport

Bus route 440 currently has two stops along Elizabeth Valley Rd and one stop on Redcliffe Rd. New road works will take into account the presence of buses along this section and accessibility to areas inside the development.

A key principle of the development is sustainability, and will be designed to support the expansion and integration of public transport throughout the development. Consideration will also be given for the creation of a park-and ride facility, similar to the one at the intersection of Girraween Road and Stuart Highway.

7.1.6 Walking and cycling

The development will focus on the creation of an environment that encourages both cycling and walking to local amenities and facilities, including the proposed school, but in addition that cycling paths will be provided for recreation purposes. These will be placed within public roadways, and the extensive network of open space.

7.1.7 Access and transport summary

In summary, the proposed rezoning will:

- » Provide multiple access points to the site allowing for effective integration of the site into the broader area,
- » Be designed to allow for effective distribution of traffic into the overarching surrounding road network
- » Support the provision of public transport in the rural area
- » Support an active and healthy lifestyle through a focus on pedestrian movement and the provision of cycle paths.

7.2 Engineering and Infrastructure Assessment

An assessment of the engineering and infrastructure issues related to the site was undertaken to inform the future development of the site.

7.2.1 Infrastructure

Detailed investigations relating to the provision of infrastructure to the subject site will be undertaken prior to lodgement of future subdivision applications. Notwithstanding, preliminary investigations have been undertaken to confirm that the future development can be serviced; details of service authority consultation can be found in Appendix C. Outcomes of the preliminary investigations are summarised below.

Water supply

Power and Water Corporation (PWC) have carried out a preliminary assessment of water supply requirements for the future development of the subject site.

Power and Water Corporation (PWC) are responsible for approving the water infrastructure works required to service the development.

Existing conditions.

There is no water infrastructure within the property boundaries. Residential allotments in the vicinity of the site are serviced with individual bore holes.

There are one DN1050MSCL and one DN300/DN375MSCL pipes running along the Stuart Hwy five km west of the development, these pipes have almost reached their capacity.

Future plans

A new Water Treatment Plant one kilometre west of Stuart Hwy off Alverly Road is planned by PWC to treat water from Manton Dam. The plans also include a proposed elevated water tank within the boundaries of the proposed development

It is understood that Power and Water Corporation are planning to build a water tank at the intersection between Stuart Hwy and Alverly Rd to service Weddell.

Depending on time of construction of these water tanks and progress at the Noonamah development it may be possible for these water tanks to service some part of the development, with further investigation required to service the balance of the site.

Proposed works

As in most large development projects the release of land in Noonamah Ridges will be staged over an estimated 20 years. The development process will be impacted by severely limited existing infrastructure in the vicinity of the site, resulting in high initial development costs.

It is envisaged that the first stages of the development could include the release of allotments that are not serviced with the ultimate water supply solution. Instead, these lots could be provided with water from a proposed bore field as a temporary solution.

Two alternatives are proposed for the servicing of the development. They are summarised below.

Option 1 (Town Water Supply)

» Option 1A

- > Ultimate servicing via existing mains and existing booster pump station (both located on Stuart Hwy). Rising mains to be DN450 (mild steel), and to either run down Elizabeth Valley Rd, or Alvery Rd. Proposal is to relocate pump station to the intersection of either Stuart Hwy/Elizabeth Valley Rd or Stuart Hwy/Alverly Rd. Relocating the existing booster pump will save length of mains required, and ultimately reduce costs. There is a risk with this option, that there could be insufficient head to service lots in higher ground.
- > Water will be pumped to one or more ground level tanks from existing mains. Three possible locations have been suggested, and are summarized below in Table 3
- > Finally, an elevated tank may need to be constructed at a later stage to service lots on higher ground. To reduce costs, alternatively, the elevated tank could be eliminated and the outstanding lots could be serviced via onsite storage or boreholes. The higher level ground could be used for recreation instead so that the water demand is minimal.

» Option 1B

- > Same as Option 1A, except preceded by initial temporary servicing of first 300 lots by connecting to existing mains off Stuart Hwy. PVC rising main and smaller size ground level water tank can be used to reduce cost subject to the approval of PWC.
- > Both options 1A and 1B require the upgrading of existing pump station.

Option 2 (Bore water)

- » Several larger boreholes could be drilled and the then water pumped to a ground level tank and then reticulated to homes. At some stage, an elevated water tank may need to be employed for the same reasons as in Option 1 above.
- » When PWC upgrades the existing head works/infrastructure and existing mains, reticulated town water could then be supplied to the development. However, this is dependent on timing of the upgrade and completion of the development.
- » Individual bore holes could be drilled for properties over 2Ha, and for lots over 4000m² where reticulated sewer is provided.
- » This option is dependent on sufficient groundwater. Preliminary data shows a high yield, high quality aquifer with no other existing boreholes east of the development.

As mentioned above, external water tanks and future upgrading works by PWC and others may also provide part of the ultimate solution for either option employed depending on availability, timing and existing infrastructure. Intrapac will work with the Government to identify an appropriate and integrated solution to service delivery in the area.

An estimate of the costs of the upgrading works, tank installation, rising main and internal reticulation is provided in Appendix C: Preliminary Engineering Assessment. Note that the costs are

subject to change based on contractors, suppliers, inflation, geological conditions, lot layout, chosen servicing option (i.e. number, type and location of tanks, booster upgrade chosen etc.)

Location of ground water tanks

Three locations for the ground water tank(s) have been considered, these are summarised in Table 1 below with advantages and disadvantages of each. It may be worthwhile employing two ground level water tanks in order to maintain more uniform pressure. This however is subject to cost and approval. The tank is required to achieve agreed storage volumes and pressure parameters across the whole site with initial calculations showing it will require the capacity to store 15 ML of water. PWC Supplement to WSA require two Ultimate Peak Day Storage but will most probably accept one day storage only. Appendix A: Drawing Set (drawing numbers 1315-SK06 & SK07) shows ground level water tank proposed location option 2.

Table 3 Ground level water tank location options

	Location 1	Location 2	Location 3
Location	Highest point close to the northern edge of Lot 3477	80 contour at the eastern edge of Lot 3476	Second highest points within northern edge of Lot 3476.at 78 contour level
Level	80-81m	80m	78m
Advantages	Located centrally between eastern and southern parts of the subdivision If pump station is relocated to Alverly Rd, DN450 rising main length could be reduced	Centrally between northern and southern parts of the subdivision	Closer to the high density development If pump station is relocated to Elizabeth Valley Rd Intersection, DN450 rising main can be reduced by approximately 1km
Disadvantages	Only possible if PWC permit the relocation of the existing booster pump station to Alvery Rd May not be economical if Lot 4574 is developed as the initial stage. Longer distribution main has to be built from Lot 3477 to Lot 4574 at the initial stage.	Total length of the proposed DN450 would be longer.	Filling would be recommended in order to increase from 78m.

Sewer

Existing conditions.

There is no sewer infrastructure within the property boundaries. Residential allotments in the vicinity of the site are serviced with septic tanks.

Future external works

Reticulated municipal sewer services are not proposed for the area in the foreseeable future. Intrapac will work with Government to determine a mutually acceptable temporary and long term solution to the provision of reticulated sewerage.

Proposed works

Option 1 KEWT treatment systems

The proposed treatment plants are KEWT systems, supplied and maintained by GBG Wastewater Management and similar to those used at the Coolalinga Shopping Centre. These systems have been approved by PWC and are a community scale onsite treatment solution, which allows the risks of treating and disposing of wastewater to remain in the low to medium risk category for public and environmental health. KEWT systems can be managed and operated under the direct oversight of the regulating authorities PWC and NT Health.

If KEWT treatment systems are to be used to service the development, it is suggested three separate systems is used throughout the development in combination with a gravity fed pipe reticulation. There are a number of advantages of installing three separate systems;

- » The size can vary in order to best cater for topographic catchments or construction schedule
- » The investment in the system can be staged along with the progress of the development to reduce the initial capital outlay required, and minimise the land lost.

Additionally a small treatment plant will be required to treat the school and the small business centre. Wastewater from schools is typically 3 to 4 times higher in nitrogen than domestic wastewater and has very low flows per student. Consequently, these flows should be treated separately.

Each system will comprise a number of tank and channel assemblies with a central tertiary treatment facility and a recycled water storage that can service the recycling needs in the associated catchment. Central to the GBG approach to wastewater treatment is the implementation of a SCADA system that will allow access and control from any computer with an internet connection. These systems will be placed on a cloud server and operators can then work with the systems as single or multiple systems from a central point via a VPN pipeline. Access can also be provided for other stakeholders, as specialised software is not needed for viewing and control. Inadvertent or malicious control actions are controlled by password protection. GBG already has local representatives in the area who will be engaged to be the "eyes and ears on the ground".

Where possible the beneficial reuse of treated water is encouraged in a bid to improve the sustainability of any treatment system. With this aim, the project proposes that five hectares of amenities facilities of certain categories of public open space within the development are irrigated with recycled water, no third pipe system is proposed for public use. Excess treated water could also be used for cropping systems. Lucerne, dry forage and bamboo are some potential crop options. A hybrid of amenity and crop irrigation could be used throughout the development depending on what is most suitable in each location. See Appendix A: Drawing Set (drawings 1315-SK06 & SK07) for possible locations for the treatment plants.

The following issues are yet to be fully considered or determined and will impact the design. Firstly, site topography should be considered prior to further design to allow for gravity flow to the sewer where possible and the presence of rock in the area will be an important factor during trenching. Secondly, there are three areas identified where natural ephemeral wetland areas are present, these areas will also not be used for construction. In addition, heritage and cultural sites, and a quarry site will not be incorporated into the development area but will be retained within the open space network. Thirdly, while a school and commercial zone are proposed, the size of these facilities is yet to be determined. The size of the school and commercial zone will impact the size and cost of the treatment facility. Lastly, a disposal strategy of treated water needs to be considered.

An estimate of the quantities of sewer treatment systems, irrigation and internal reticulation is provided in Appendix C: Cost Estimates.

Option 2 (Combination of septic & KEWT treatment systems)

The topography of the site and the staging of the development mean the optimal solution to sewer the area may be to combine different sewer solutions. There is the potential to provide septic tanks for the larger allotments and sewer treatment plants for the smaller lots. In addition, the first 300 lots could be provided with septic tanks. This option will still provide aquifer protection. It will reduce or eliminate the required reticulation, land requirements, overall cost of infrastructure installation, maintenance and running costs.

Proposed size of land required for irrigation

As stated earlier, the proposed development will be 3000 lots. Current best practice assumes 3.5 Equivalent Person (EP) per residence giving a total of 10,500 EP for the site.

Initial modelling suggests the required treatment area is 5Ha/1000 EP. However, this is a very conservative estimate, and most likely could be reduced to around 3Ha/1000 EP. Consequently, between 52.5 and 31.5Ha will be required for treatment if option 1 is employed. Land requirements will be less for option 2.

Power

Power and Water Corporation (PWC) are responsible for approving the electrical infrastructure works required to service the development.

Existing conditions

The existing PWC network in the rural area is 22kV (overhead). There is minimal spare capacity in the existing PWC network in the area of the proposed subdivision and as such is not adequate to service the proposed subdivision.

Proposed works

PWC were consulted to obtain information on existing electrical infrastructure and possible interconnection requirements with existing reticulation.

The estimate load allocations across the site are classified as basic supply, which is the loads to be used as part of the subdivision design for lot servicing.

PWC load allocations standards are as follows:

- » Single Dwelling (SD) lot : 4.5kVA
- » Rural Residential (RR) lot : 10 kVA
- » Rural Living (RL) lot : 25kVA

Based on above, the load allocations are estimated as follows:

- » RR lots (2000 lots) - 20MVA
- » SD lots (1150 lots) - 5.2MVA
- » Multiple Dwelling (MD) lots (50 lots) - 1.7MVA
- » School/Commercial precinct – 2.5MVA

Based on the above load allocations the total basic supply equates to approximately 29.4MVA. This includes substation sizing.

The following will also affect the design:

- » Lot zoning and lot zone distribution
 - > Urban areas will require underground 22kV and rural overhead 22kV.
 - > The load allocations are based on an estimate of the lot zone distribution. If this estimate changes, the power requirements will change
 - > Street lighting will need to be provided in urban areas, but not in rural (this is subject to change due to new Litchfield Council requirements currently in draft form).
- » Size of school & commercial precinct
 - > Currently, only an estimate is available, more or less power may be required.

There are two options to provide the additional capacity as summarised below:

Option 1

This option includes the provision of two dedicated feeders (one overhead and one underground) from McMinn's Zone Substation (adjacent to Stuart Hwy-Arnhem Hwy intersection). The proposed dedicated feeders will have the following approximate ratings:

- » 22kV Overhead (Neon): 6.2MVA based on 15km route - \$3M plus 10% GST
- » 22kV Underground (Aluminium 400sqmm): 14.6MVA based on 12.5km route - \$5M plus 10% GST

PWC have advised that McMinn's Zone Substation is to be upgraded and that there will be capacity to allow for above two feeders to be connected. This option is preferred by PWC and would provide the required capacity for the proposed subdivision. Due to the higher cost of the underground feeder, it is recommended that the overhead feeder be provided before the underground and the underground feeder to be provided once the load on the overhead feeder reaches a maximum acceptable level to PWC as a single dedicated feeder. It is expected that the underground feeder would be required in the second or third year of development. PWC are to review the network in this area in the next few years and there may be the possibility of interconnecting with either Weddell or Manton Zone Substations. The proposed reticulation within the subdivision may consist of a combination of 22KV underground and overhead supply. See Appendix A: Drawing Set, drawings 1315-SK06 and 1315-SK07 for option 1 and 2 respectively.

Option 2

The establishment of a Zone Substation which would be interconnected to existing PWC 66kV transmission line via new 66kV transmission line extension. The Zone Substation would ideally be located close to the main/high load area, with a recommended location being near Alverly Rd/Redcliffe Rd intersection. The Developer would be required to provide the land allocation (100mx100m: 1Ha) required. The associated costs of the Zone Substation (\$12-13M approx.) and 66kV transmission line extension/interconnection would need to be further discussed with PWC to determine/confirm cost contribution (if any) the developer would be required to make.

The issue with the establishment of a Zone Substation is timeframe. PWC have advised that the timeframe currently is between 2-3 years from when planning begins to when a Zone Substation is commissioned. Therefore, this option is not considered viable at this stage by PWC. Until the Zone Substation is constructed, a temporary solution could be provided.

7.3 Traffic, Engineering and Infrastructure Summary

In summary, development of the subject site will:

- » The site can be serviced from a water, power and sewerage perspective through a range of alternatives, employing interim and long term solutions
- » Design of infrastructure will be undertaken in close consultation with Power and Water Corporation
- » Sufficient capacity exists within the surrounding road network to accommodate the proposed development, with detailed analysis to the broader network to be undertaken in close consultation with the Department of Transport
- » Achieve best practice for not only ecologically sustainable development but for efficient use of available infrastructure
- » Provide alternative transportation options by designing for public transport, cyclists and pedestrians
- » Enhance the natural landscape and drainage systems

Provide best outcomes from an environmental perspective.

8 Environmental Investigations

8.1 Environment Assessment Approach

A preliminary environmental assessment has been undertaken by EcOz Consulting, and is attached at Appendix B

The assessment considers the following key regional assets or areas of interest based on developing Noonamah Ridge Estate, consisting of a mixture of allotment sizes:

- » surface water integrity and quality
- » ground water supply and quality
- » landscape and soils
- » biodiversity
- » historic and cultural significance
- » health safety and amenity
- » socio-economic environment
- » maintenance of infrastructure

The detailed discussion on the environmental characteristics of the site is contained in the draft environmental assessment, however the key concerns for each of the areas of risk are summarised below, including the proposed mitigation measure and further studies intended to support the staged development within the proposed Specific Use Zone.

8.2 Surface water integrity and quality

8.2.1 Key concerns

Key concerns for maintaining the integrity of surface water and quality include:

- » Altered surface flows (increased coefficient in proportion to the density of development and potentially altered directions)
- » Increased nutrient levels and sediment for surface water flows (particularly in areas with allotments averaging <5ha)
- » Potential for septic systems to fail (due to inappropriate use) or overflow during intense rainfall events

8.2.2 Mitigations

The proposed development of Noonamah Ridge Estate will be undertaken within the framework of a storm water design and management blue print will developed for the entire estate in a staged manner, and controlled through the proposed Specific Use Zone. The following mitigation measures are proposed:

- » Appropriate stormwater management principles will be applied including potential design of bio-retention services within the existing drainage systems and grassed swales to entrap and process nutrients
- » Design specifications of septic/sewerage systems, roads and storm water will accommodate intense rainfall events
- » Water discharge licenses shall be sought should overflow of septic/sewerage systems in the wet season be anticipated

8.2.3 Proposed studies

- » Appropriate stormwater management systems will be developed based on existing local waterways and varied in design according the intensity of development. Issues such as amenity, mosquitos and fire management will be considered in their design.
- » Scoping appropriate design measures to accommodate flood mitigation, entrapment, and processing of nutrients on site.

8.3 Ground water supply and quality

8.3.1 Key Concerns

Key concerns for maintaining the integrity of ground water supply and quality include:

- » Potential for significant draw down on existing ground water supplies through either communal water supplies and/or individual bores on rural allotments.
- » Potential for contamination of ground water from septic systems

8.3.2 Proposed Mitigation Measures

- » Land titles will include conditions for water meters and covenants for domestic bores on individual lots 5ha or greater
- » Communal bore fields to accommodate utilisation caps to constrain water use and land use buffers around bores/potential bore fields to reduce the opportunity for potential contamination and excessive draw down.

8.3.3 Proposed Studies

- » Desktop modelling of ground water availability for feasibility of supply (both at a property level and communal supply level)
- » Desktop assessment and modelling of potential contamination sources for ground water

8.4 Landscape and soils

The development will be designed to respond to the landscape and soils, allowing land capability to determine intensity of development, and with road layout aimed to limit cut and fill, as well as erosion.

8.4.1 Key Concerns

Over 50% of the estate comprises a moderate to high degree of erosion vulnerability, featuring steep slopes and areas with skeletal soils and little vegetation cover due to a high degree of rock cover. The lowland areas feature localised areas prone to periodic inundation.

Key concerns are:

- » Built infrastructure requires appropriate placement, design and maintenance to avoid or contain erosion and sediment movement
- » Development within individual allotments will require careful consideration of erosion potential and implications of altered surface flow especially within land types with a raised profile and high degree of rock cover

8.4.2 Potential Mitigation Measures

The effect of the development on soils and slope will be addressed through appropriate site layout planning, allowing soil types, land capability and slope to dictate the layout and specifically density, this will occur through:

- » Zoning of the estate for land capability to support smaller (<5ha) rural allotments and varying intensity of service provision and storm water design
- » Lowlands shall be targeted for smaller allotments (<5ha) whereas the hill and rises shall be targeted for larger allotments (~5ha or greater)
- » Development of an erosion and sediment control plan, inclusive of a storm water plan for the estate, for each stage of development, to be incorporated into the proposed Specific Use Zone.
- » Land parcels will accommodate an appropriately placed development envelope and the remaining land will have a covenant to protect integrity of the landscape and native vegetation
- » Development of an overarching storm water plan (refer also to surface water quality risks)

8.4.3 Proposed studies

- » Land capability assessment by zoned areas according to the intensity of development (e.g. Areas zoned Rural Living to be zoned under the Specific Use category and incorporating lots ranging from 1ha – 5ha will require more detailed land capability studies). Refer to Appendix B
- » Specific land capability studies for suitable placement of septic systems and other infrastructure
- » Assessment of constrained/unconstrained land for individual allotments >5ha

8.5 Biodiversity Conservation

8.5.1 Key concerns:

As reflected in the desktop studies contained within the initial environmental assessment, there is the potential for threatened or rare species and high value habitat to be present within the region, and possibly the site:

- » Threatened or rare species - at the least the following species are likely to be present: Partridge Pigeon (*Geophaps smithii*), Pale Field-rat (*Rattus tunneyi*), Howard Springs Toadlet (*Uperoleia daviesae*), Armstrong's Cycad (*Cycas armstrongii*) and Yellow-spotted Monitor (*Varanus panoptes*)

- » High value habitat - at least two localised areas of Sandsheet are present. Open forest may also be present in the drainage of the hilly areas. Two springs or expressions of ground water are also located within the hilly landform.
- » Litchfield Priority Environmental Management Areas (PEMs) are located within the drainage areas largely along the edges of the estate (mapped as water logged soils Figure 4-15)
- » Few flora and fauna surveys have been conducted within the region there is potential for other biodiversity values to be identified.
- » Key concerns for conserving local and regional biodiversity values include alterations of key ecological processes such as:
 - > Altered surface flow – either direction of water away from the natural flow or increasing water shed to existing drainage areas
 - > Increased sediment and nutrient input to surface flows - particularly increasing nutrients to Sandsheet habitats as these are low nutrient environments
 - > Fire – public space may be prone to frequent burning as in other parts of Darwin, weeds such as Gamba Grass will need a high degree of coordinated effort to manage with multiple landowners, private land tends to manage fire for fire suppression, which can be deleterious to habitat quality over the long term. Also refer to safety section 5.6
- » Introduction and increase of pest species are also a concern:
 - > Weeds – increased opportunity for the introduction and spread of weeds during construction and long term. There may be a need for increased coordination and reliance on voluntary action to manage significant weed infestations particularly those fuelling extreme fires (such as Gamba Grass)
 - > Pest animals – increased opportunity for toads, cats and exotic fish and ants to be either introduced, establish and increase within the area due to increased availability of conditions favouring their populations

8.5.2 Potential Mitigation Measures

- » Avoid development within the areas prone to water logging (particularly those demarked as PEM's) utilising these areas to accommodate wildlife corridors on private land tenure or feature as public lands with multiple purposes (e.g. wildlife corridors, storm water services and parklands)
- » Recognition of the NT Clearing Guidelines to identified high value habitat where possible
- » Allotments will incorporate designated development envelopes and remaining areas shall be covenanted for wildlife corridors
- » Development envelopes will aim to avoid high value habitat for threatened or rare species with an appropriate buffer where possible
- » Allotments 5ha and greater shall incorporate covenants where possible to retain wildlife corridors
- » Storm water and drainage design sensitive to the natural drainage patterns and incorporating grasses swales and retarding basins where required for the areas targeted for allotments ranging from 1-5ha (refer to sections 5.1 and 5.3)
- » Incorporation of local to regional scale wildlife corridors (largely aligning to drainage patterns) within private allotments through the application of covenants

- » Fire management for wildlife corridors to be incorporated into the developments fire management plan as well as road and allotment design
- » Individual allotments 5ha or greater shall incorporate 4m perimeter fire breaks
- » Recommended hygiene protocols to be compiled for subcontractors for invasive species (inclusive of ants) for the construction phase
- » Develop an extraction/recovery plan for Armstrong's Cycad (*Cycas armstrongii*) for their removal and use in amenity plantings/landscaping

8.5.3 Proposed studies

Increased knowledge of on-site conditions to better inform the subdivision design may include:

- » Survey for vegetation types likely to be targeted for development – particularly in drainage areas
- » General fauna surveys – with a particular emphasis in on threatened species known and likely to be present – targeted at least initially to the build up
- » Targeted surveys for Sandsheet habitat and associated threatened plant species in the lowland area
- » Targeted survey for the Howard River Toadlet within Sandsheet and riparian habitat
- » Survey for existing weed presence for each stage of development

8.6 Site of historic and cultural significance

8.6.1 Key concerns

At this stage the main concerns for culture and heritage are a recorded heritage site (a crashed warplane) and a recorded sacred site. It is the intention to incorporate these into the development, either through appropriate buffers, or incorporation into open space as a site feature for the enjoyment of residents.

8.6.2 Potential Mitigation Measures

- » Identified sites of cultural and heritage significance will be avoided with an appropriate buffer
- » The development design will make a feature of the plane wreckage (HC2268) if possible
- » An AAPA certificate shall be sought for each stage of development

8.6.3 Proposed studies

Further studies will include:

- Archaeological assessment for each stage of development

8.7 Public health, safety & amenity

8.7.1 Key concerns

Key concerns to health and safety associated with the proposed Noonamah Ridge Estate include:

- » Existing radio towers may require buffering from radiation (refer to appendix A)
- » Wildfire - the threat and management of wildfire for life and property
- » Biting insects - the potential for increased contact with biting insects, and associated mosquito borne diseases either through increased water flow to existing drainage areas, retention of water in potential bio-reticulation and storm water structures or increased residential areas situated near to temporary standing water
- » Emergency services - access to and capacity of emergency services
- » Accessibility during extreme weather events – e.g. flood proneness and access during cyclonic rain events

8.7.2 Mitigations

- » The development design shall accommodate appropriate buffers for existing radio towers
- » Road design, fence placement and design of storm water infrastructure shall accommodate the functionality for managing wildfire
- » Development of a fire management plan
- » Development of water stores for fire fighting

8.7.3 Proposed studies

- » Investigation of reticulate sewerage and storage and reuse of treated water for fire fighting
- » Investigate areas of Koolpinyah which may be managed as a broad fire break to the east of the development
- » Investigation of artificial wetlands (e.g. small lakes) associated with storm water management which can reduce the opportunity for mosquitos through native fish species

8.8 Socio-economic environment

8.8.1 Key concerns

Key areas of concern to the socio-economic environment include:

- » Pressure on existing road infrastructure and services & service providers (particularly schools and emergency and medical services)
- » Potential impact of the proposed Arterial Links to Glyde and Gunn Point
- » Altered character to the existing rural developments
- » Increased pressure on services for general council services: e.g. management of public space for weeds & fire, waste management etc.

8.8.2 Potential Mitigation Measures

- » Development of a traffic management plan
- » Development design to accommodate the proposed Arterial Links to Glyde and Gunn Point with appropriate traffic management and buffers for noise and dust associated with the volume and size of future traffic
- » Project communication plan
- » Establishment of a local town centre and local school

8.8.3 Proposed studies

- » A comprehensive community consultation strategy

8.9 Stormwater drainage

Litchfield Council and the Land Resources Department are responsible for approving the Stormwater Management Plan for this development.

8.9.1 Existing conditions

Climate

The climate in Noonamah is highly seasonal and dominated by an extreme wet season from December to March. During this period, vegetation growth is significant, soils become saturated, groundwater recharge fills local aquifers and stream flows may be formed in low areas. The dry season runs for the rest of the year in which local streams cease to flow and irrigation of landscape areas is required. The average annual rainfall is 1700 mm per year.

Topography and drainage

The proposed development is located in a green field area that covers approximately 2400 hectares with some areas showing relative soft gradients between 0.1 and 2.0 per cent and others steep slopes of up to 5 per cent, except for the ridge line which crosses the property through the middle running north to south. Valleys can be identified all across the site and some localised low areas can be found along Redcliff Rd. Appendix A: Drawing Set (Drawing 1315-SK08&SK09) includes sketches showing the catchment areas, valleys, areas subject to flooding, the receiving ecosystems and existing culverts.

Along Redcliffe Rd, six culverts have been constructed as part of the drainage works in the area, two of which have been provided with flood plain rock protection. Two culverts have also been surveyed on Townend Rd and two more on a dirt track inside the development.

Across the western side of the development and along Mocatto Rd reserve, three low points provide overland flow path for the runoff from the site to areas outside the property boundaries.

Receiving ecosystems

The western catchments drain to three unnamed creeks located either side of Elizabeth Valley Rd. To the north, the creek crosses the road and runs along an area marked as conservation zone on the NT Land Zoning maps. All these creeks run for approximately one kilometre before they converge into a larger system, which finally drains to the Elizabeth River. South of Alverly Rd there are also signs of small valleys draining to the same system. The eastern part of the developments

drains to Lloyds Creek and Acacia Creek, which flow to the Adelaide River 15 kilometres to the east. This can be seen in Appendix A: Drawing Set (drawing 1315-SK09).

Proposed works

Stormwater quality

In order to protect the unnamed creeks and Lloyds Creek the development proposes the implementation of a drainage strategy plan in line with the Darwin Harbour Strategy.

The Darwin Harbour Strategy (Darwin Harbour Advisory Committee 2010) includes the following guidelines:

- » 1.4 Water quality and ecological health of the marine, freshwater and terrestrial catchment environments in the region are to be maintained or, if quality and health have been negatively affected through human activity, improved where possible
- » 1.10 Stormwater collection systems are to be designed and managed to minimise pollution of receiving waters, protect the structure of waterways, optimise the protections of property, and where and when possible provide grey water for reuse and ensure public health and safety.

The development will introduce a drainage management system aiming to reduce the discharge of pollutants into the receiving system; stormwater infrastructure will be incorporated to remove a proportion of the total suspended solids, nitrogen, phosphorous and gross pollutants. Integration of landscaping spaces with conservation corridors, stormwater systems and recreational facilities is a key principle of the stormwater strategy. Drainage features such as swales, silt traps, permeable paving and retarding basins can be integrated across the site in accordance with best environmental practices.

For the duration of construction phase including roads, drainage, utilities and buildings, the project will implement an erosion control plan for the protection of the receiving systems, these measures include retarding basins and silt traps located at critical location within the drainage system.

Water conservation

The water strategy will also include consideration to wastewater minimisation, potable water conservation, and stream stability.

Potable water conservation will include reducing the garden irrigation demand of potable water by adopting low water use landscaping in public parks, encouraging low water use garden in private allotments and use of recycled water for irrigation.

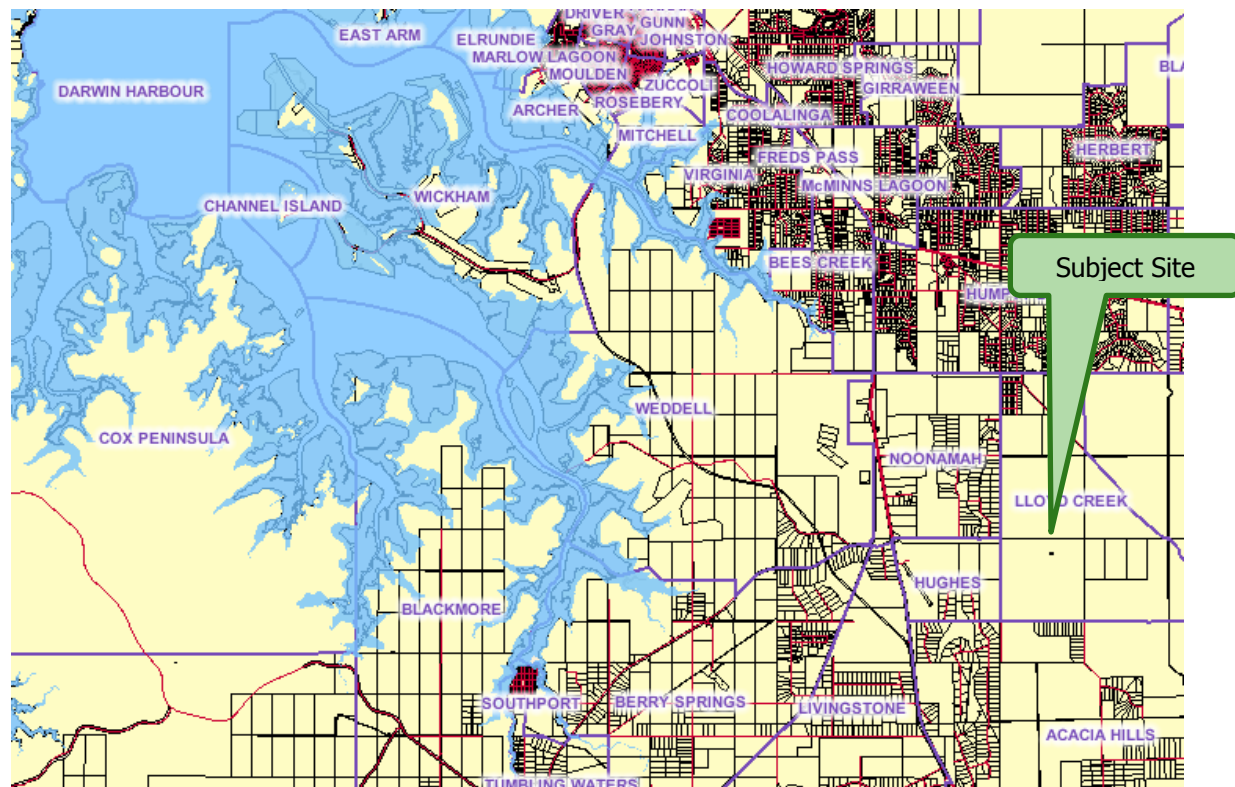
The development will aim to minimise the wastewater and reduce the outflow by using sewer treatment plants where feasible.

Qualitative stream stability will be achieved by maintaining natural sediment supply rates to the receiving watercourses and the preservation of dry and wet season flow regimes.

8.10 Storm surge

Mapping provided on the NT Atlas and Spatial Data Directory indicates that the site is not affected by Storm Surge (refer to Figure 4 below).

Figure 4 Storm surge map



Source: NT Atlas & Spatial Directory

8.11 Summary of Environmental Considerations

It is evident from the above that due consideration has been given to the main environmental considerations affecting the proposed development of Noonamah Ridge Estate. In summary:

- » The site represents a diverse landscape with a range of environmental opportunities
- » Appropriate mitigation measures for the key environmental considerations are available, and will be considered in the detailed subdivision design of each stage
- » Detailed environmental studies will be undertaken on a stage by stage basis, depending on the requirements specific to that stage
- » No significant environmental issues have been identified that would preclude the proposed development
- » Significant opportunity exists to include environmental features into the development in a manner that responds to the environmental sensitivities while contributing to the amenity of the area.

9 Sustainability Targets

An assessment of sustainability issues was undertaken to inform the future development of the site.

9.1 Sustainability intentions

The intent of the proposal is to deliver a master planned community that achieves best practices for ecologically sustainable development. The developers are able to draw on national resources in designing and implementing sustainability initiatives and demonstrated experience in achieving sustainable tropical design outcomes in the Northern Territory.

The sustainable development strategy for the subject site will not only focus on achieving higher environmental performance than required, but will also deliver best practice social, environmental, cultural and economic initiatives.

9.2 Sustainability approach

Sustainability is fundamentally about providing a community that meets the needs of its residents both now and in the future. The master plan is based on developing a residential community for the long term by creating an early foundation of good design, community engagement and governance.

The vision for the proposal is to maximise the potential of its geography, location and regional positioning to deliver a contemporary, sustainable residential community that provides housing diversity and lifestyle choice in a rural setting. Sustainability initiatives will be directed not only to this goal but will also reflect the Territory 2030 Strategic Plan aim that *communities will be well planned, with cities and towns planned to account for the needs of our people, our environment and our sustainable future.*

Achieving leading edge sustainable residential communities is built on good science and a sound commercial basis. Every sustainability initiative to be implemented by the project will be practical, affordable and replicable and will deliver for the project.

Sustainable communities cannot be delivered over the long term by the development industry alone. For this reason, Intrapac has established relationships with a range of delivery partners across government, non-government agencies and the community to implement the sustainability initiatives.

The intent is that the proposed subject site will provide optimal diversity in form and a level of liveability unsurpassed in this local region. Other social infrastructure will be developed through a Community Plan, which will be a collaborative consultation process with community, government and key delivery partners to ensure quality social outcomes and shared ownership from project inception.

9.3 Sustainability vision and commitments

The vision for the project is to be an example to the Northern Territory of sustainable tropical residential living. The proposed key directions to ensure that this goal is achieved include:

Table 4 Key sustainability objectives

Climate change and greenhouse action	A Greenhouse Gas Emissions Reduction Strategy that will use smart design, community education and greenhouse gas offset plantings to reduce greenhouse emissions
Sustainable transport	Transport planning and design that prioritises pedestrian and cycle movements, connects to public transport and provides safety and amenity
Ecological footprint	New housing designs responsive to sustainable tropical living. Setting targets for waste reduction and water conservation
Biodiversity	A landscape strategy that enhances the natural drainage systems, preserves as much vegetation as possible, identifies natural bushland corridors and encourages wildlife
Economic sustainability	A dedicated local economic development manager within Intrapac will foster new enterprises and support the local town centre
Health and well-being	A Community Plan will be developed that provides facilities and services for all ages.
Equity	A commitment to meeting the Northern Territory's affordable housing target

9.4 Sustainability Management Strategy

A sustainability management strategy will be developed and lodged in support of the rezoning application.

9.5 Sustainability summary

In summary, the proposal will:

- » Achieve best practice for not only ecologically sustainable development but for social, environmental, cultural and economic sustainability as well.
- » Provide optimal diversity in housing form and level of liveability.
- » Commit to a reduction in greenhouse gas emissions, waste and water usage.
- » Provide alternative transportation options by designing for public transport, cyclists and pedestrians.
- » Enhance the natural landscape and drainage systems.
- » Support local economic development.
- » Create a unique identity for the local community.
- » Provide affordable housing opportunities.

10 Stakeholder & Community Consultation

10.1 Consultation purpose and process

A comprehensive and transparent community and stakeholder engagement process has been adopted to facilitate constructive dialogue between the project team and all key stakeholders.

The approach to engagement to date has been to work with Northern Territory Government agencies, in the preparation of the Significant Development Application. Key objectives of the consultation process have been to:

- » Provide accurate and timely information on the proposed development and intended planning process
- » Identify issues of concern to key stakeholders, and service authorities
- » Provide guidance on appropriate technical studies and informants to the development process

Information gathered during the consultation process has been used to inform the approach to the Significant Development Proposal, and draft site layout.

The consultation process has been undertaken by Elton Consulting in conjunction with the project team. To date, extensive consultation activities have occurred, including one on one meetings with the following organisations, agencies and bodies:

- » Minister for Lands, Planning and the Environment
- » Chair, Northern Territory Planning Commission
- » Chair, Northern Territory Environment Protection Authority
- » Chief Executive, Department of Lands, Planning and the Environment
- » Department of Lands, Planning and the Environment, Lands Planning
- » Department of Land Resource Management
- » Power and Water Corporation
- » Department of Transport
- » Litchfield Council

The response to the development has been overwhelming positive, and technical recommendations have been incorporated into this proposal

10.2 Future Consultation Strategy

Following lodgement of this Significant Development Proposal, a comprehensive stakeholder and community consultation process will be undertaken, including:

- » Ongoing consultation with service authorities, and the organisations listed under section 10.1
- » Detailed presentations to the Minister for Lands, Planning and the Environment, the two affected Local Members of the Legislative Assembly
- » Detailed presentations to Litchfield Council and the local Councillor
- » A public website allowing residents to provide input into the process
- » A comprehensive community consultation process, including Community Information and Feedback Sessions

11 Conclusion

This report is lodged with the Minister for Lands, Planning and the Environmental as well as the Northern Territory Environment Protection Authority for simultaneous processing of:

» A **Significant Development Proposal**

» **Notice of Intent**

The proposal comprises a 2,600ha property with the potential to deliver in excess of 3500 residential opportunities, along with supporting community infrastructure and the creation of a new local town centre. This proposal represents a unique opportunity to develop a substantial tract of land as a new settlement within Darwin's rural hinterland, on land largely unconstrained and as an effective alternative to the development of Weddell.

A development of this scale will have significant benefits to the greater Darwin region, through the provision of

- » Much needed residential opportunities,
- » A range of lot typologies in a rural setting providing alternatives to a rural lifestyle that does not currently exist
- » The creation of a new local town centre within the rural area accommodating retail and commercial land uses, a new regional school and a variety of recreation activities
- » The creation of a regional open space network providing opportunities for the retention of ecological corridors and natural drainage systems, as well as for the creation of active and passive recreation.

The application is considered to be a Significant Development on the basis that it:

- » Requires a development permit prior to development
- » Will provide a development that will be significant to the future development of the Darwin Region through:
 - > The provision of a new local town centre
 - > The provision of over 3500 residential opportunities incorporating a range in lot sizes, character and typologies
 - > Provide employment opportunities
 - > Provide new recreation, social and community facilities including the site for a new school
- » The development will also affect the development of the Greater Darwin Regional Land Use Strategy, and direction of strategic planning for the future growth of the Top End
- » Will affect the natural environment, as determined by the Planning Act, within the framework of the allowing the land capability to inform the physical development of the site.

The provisional environmental assessment has further shown that the site comprises a broad diversity in land types, with generally a high level of land capability.

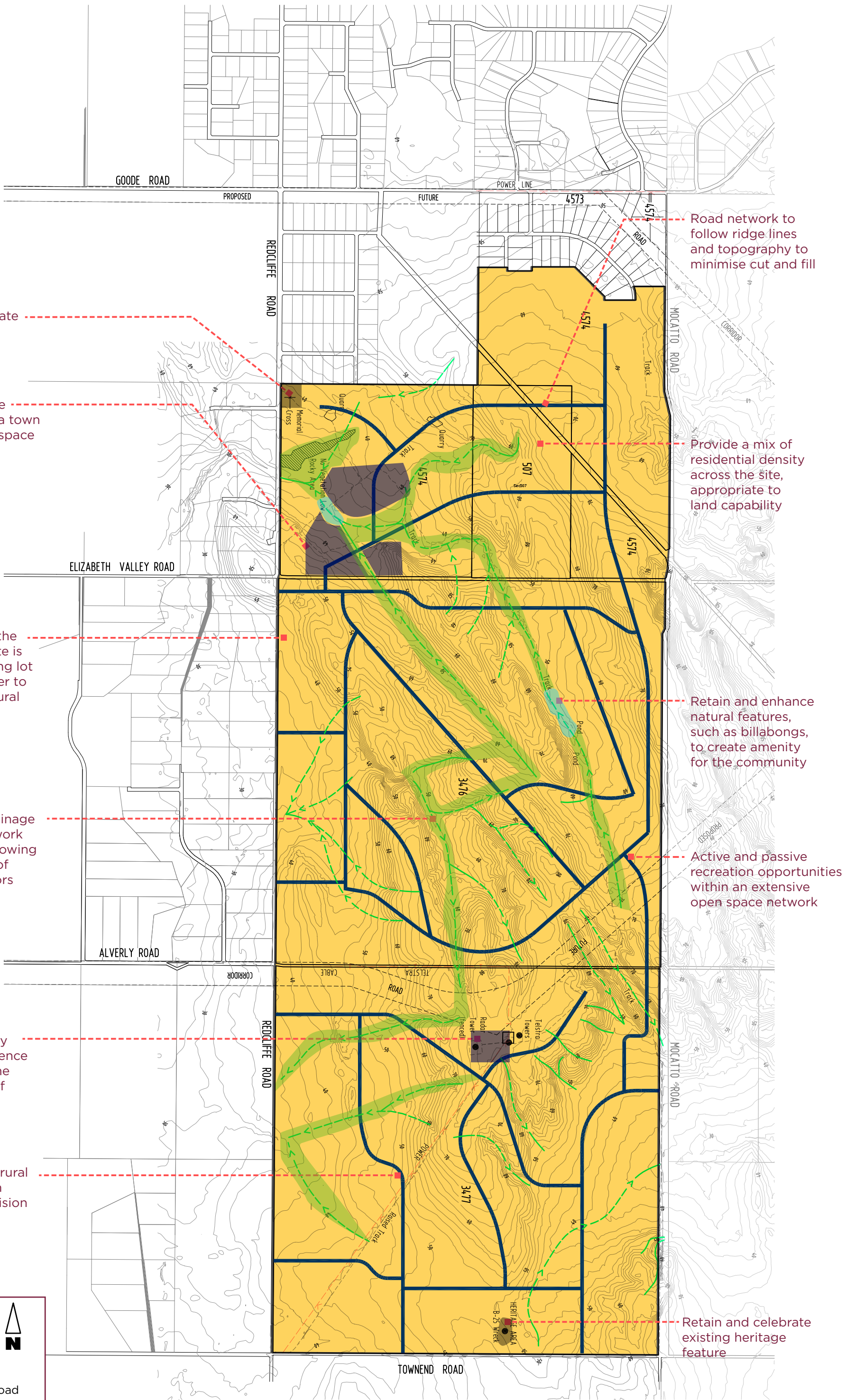
The design process is intended to be environmentally responsive, allowing the land capability to dictate the lot density and road layout.

The application is consequently submitted for the Minister's favourable response.

Appendices

- A Concept Area Plan
- B Preliminary Environment Assessment
- C Preliminary Engineering & Infrastructure Assessment

A Concept Area Plan



Scale 1:15000 A1

0 150 300 450 600 750



Legend

- Collector Road
- Existing Valleys