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RPS Australia East Pty Ltd ABN 44 140 292 762
A member of the RPS Group Plc

Date: 29 August 2018/29/08/2018
Our Ref: PR141398/OLD/SD/L77866

Via: Email

The Chief Executive Officer
Etheridge Shire Council
PO Box 12
Georgetown QLD 4871

Attn: Mr Daniel Munro

Dear Sir,

RE: GEORGETOWN INDUSTRIAL LAND MASTERPLAN

We refer to the above matter and have pleasure in submitting our preferred Masterplan (along with the two alternative options) for Council's consideration. We provide the following advice and information to assist Council when considering these documents.

1.0 Background

In recent years, Etheridge Shire Council has been investigating the potential to develop the Gilbert River area as a major irrigated agricultural precinct. There is the potential that the area will yield up to 40,000 hectares of land suitable for irrigated production of a range of crop, including cotton, legumes and grains.

Should this potential be realised, it is expected that demand will emerge for an increase in industrial land to service increasing demands associated with the increases in agricultural production. In order to be in a position to respond to and support this potential increase in demand for industrial land, Council has initiated negotiations with the Queensland Department of Natural Resources and Mines to acquire an area of unused road reserve on the western boundary of the town of Georgetown. The intent is to develop an industrial precinct able to accommodate a range of land uses that could emerge as a result of the potential expansion of agricultural activities in the region.

Whilst these negotiations are proceeding, Council commissioned RPS to prepare a Masterplan of the proposed industrial precinct. This Masterplan was required to identify and assess constraints and opportunities which effect the site, and to then prepare a concept plan that would provide direction for the future development of the land in such a way as to meet a number of target objectives, including:-

- Optimisation of the full potential of the land;
- Incorporation of common design features so as to create an aesthetically pleasing outcome; and

- Provision for easy and free-flowing traffic movement, particularly taking into consideration the expectation of significant volumes of heavy vehicle movement within the precinct, likely to include B-Double and Road Train configuration.

2.0 Site Requirement Assessment

2.1 Overview

Council's Study Brief identified a number of facilities and potential end uses that emerge for land that should be accommodated/provided for within the industrial precinct. These included: -

- A cotton gin, for the processing of raw cotton grown in the region
- A weighbridge, for use by a range of haulage users,
- Grain storage facilities, likely in the form of silos,
- Cattle holding yards, for the short-term spelling of cattle either in transit or awaiting transport,
- A range of industrial lots of various size, to provide flexibility to accommodate specific site requirements of individual end users,
- A road system able to accommodate heavy, multi-trailer transport vehicles,
- Areas of open space, to provide passive recreation and amenity benefits to workers etc

In addition to these facilities, the RPS Study Team have identified the potential demand for a heavy vehicle wash-down facility, particularly given the general increase in awareness of /sensitivity to biosecurity issues in the primary industry sector.

Before "putting pen to paper" on the Masterplan, members of the study team, including Dr Margaret Jewell (Premise Agriculture) undertook research on a range of issues likely to influence the detailed design and layout of the precinct. Issues that were investigated included:-

- Revision of common industrial land use requirements within a range of planning instruments, including the current Etheridge Shire Planning Scheme as well as other planning schemes and policies, and
- Research into typical siting arrangements (especially site area requirements) for the specific land use facilities identified in Council's brief.

The results of this research are summarised in the following sections of this report.

2.2 Cotton Gin

Cotton gins in Australia have been historically located in regional cotton growing areas, to reduce transport costs associated with processing. Mechanically harvested cotton is pressed into large round modules or rectangular blocks and transported to a cotton gin for initial processing. RPS notes that the size requirements for cotton gins have gradually reduced in recent years given that the way in which cotton is stored in modules. Modern modules are compacted to limit the degree of yield and quality loss in cotton, thus reducing required storage area.

Processing of the cotton strips the cotton lint from the seeds, with cottonseed representing approximately 50% of the ginned cotton's weight. Cotton fibre represents approximately 40% of ginned cotton's weight and the remaining 10% is a waste product comprising mostly organic matter. Dr Jewell has indicated that further

advances in the waste composting processes have reduced the required area needed for waste disposal and management, and estimates that approximately 10 ha would be required. Whilst there have been reductions made, it is safe to assume that waste product management would require a sizeable area. RPS have examined the following two (2) existing cotton gins to provide a point of reference.

- Emerald Cotton Gin, which currently operates on a site of approximately 19 ha; and
- Dalby Cotton Gin, which currently operates on a site of approximately 10 ha.

Estimates of allotment size for establishing a cotton gin are based upon a number of factors, including:

- Cotton production area and yields;
- Demand for the establishment of a cotton gin; and
- Land suitability studies, including soil analysis.

Based upon these findings, the study team has adopted 10 hectares as an appropriate site area able to accommodate a commercial-size cotton gin (noting that, under the preferred option Masterplan layout, there is the ability to easily expand this site area, should the need arise).

2.3 Cattle Holding Yards

Well designed cattle yards are essential for the efficient and safe handling of stock. It is noted that the main component of cattle holding yards are the receiving and holding yards and it is possible to construct the nucleus of the facility that can be added to as cattle numbers and operations demand.

Dr Jewell has advised that as a guide, for a typical 1,000 head in transfer yard (1.75m²per head) and a further 1,000 head capacity in spelling yards (4.0m² per head), including gateways / lanes and drainage channels, requires approximately 1 hectare. Based on an entire facility inclusive of yards, roads, commodities storage, office, effluent ponds, truck wash, weighbridge etc. it is estimated that 15-20 ha would be considered adequate. Furthermore, it is noted that each additional 1,000 head of capacity within the facility, does not result in a significant increase in area requirements.

On the assumption that weighbridge and washdown facilities would be provided as “common user” facilities separate to the actual holding yards, the preferred option Masterplan (Option 5) provides for a site area of 12.5 to 14 hectares for cattle holding yards. The study team are of the view that this would be sufficient to meet any anticipated demands (albeit with the ability to expand onto other areas within the precinct if demand warrants).

2.4 Grain Storage Silos

Grain silos play a significant role within regional Australia as storage facilities. Generally located in close proximity to existing rail corridors they are an integral part of the Australia agricultural landscape. Demand use and marketing of bulk storage product will dictate the number of silos required within Etheridge Shire. Premise has determined that approximately 10 to 30 hectares of area will be required for proposed silo development, based on existing silos located in other rural locations. Based on the assumption that grain stored within the silos is for cattle consumption, it is likely that the estimated area required for the proposed development would be closer to 10 hectares.

2.5 Industrial Allotments

The provision of industrial allotments with the Industrial Precinct of Etheridge Shire will be wholly dependant upon the demand and the availability of suitably positioned and sized allotments. The proposed configuration of any future land uses must be flexible to accommodate a range of proposed users whilst ensuring compliance with the Planning Scheme. However, the preferred option Masterplan provides for lot sizes ranging upwards from 5,000 sq. mtrs, again with the flexibility to be able to amend lot configuration to meet specific site requirements of particular end users.

3.0 Master Planning Process

As part of the process of preparing the Masterplan for the Georgetown industrial precinct, the study team undertook a desk-top analysis of available site data. Due to limited data availability and time constraints, this analysis was limited to :-

- Analysis of existing LiDAR (aerial laser survey) data over the eastern portion of the site,
- Broader-scale topographic mapping over the balance of the site, and
- Review of aerial imagery of the site, particularly to identify drainage paths, areas of vegetation etc.

Whilst this level of analysis provides a reasonable degree of confidence to allow broad-scale masterplanning to proceed, it will be necessary to complete a range of more detailed site studies/investigations before proceeding with more detailed design. These are likely to include :-

- Topography and slope analysis, to determine suitability of the site for proposed land use options and to guide planning and design considerations so as to minimise environmental, visual and amenity impacts associated with any proposed development;
- Drainage analysis, including hydraulic and hydrologic design requirements, so as to provide guidance for site selection in terms of suitability and proposed land uses. Hydraulic analysis will be required to design either pipes or overland flows systems and hydrologic design component will assess the catchment area and the run-off coefficients for the site, which is of particular concern in relation to proposed use for cattle holding yards, namely effluent ponds and wastes disposal areas of cotton gins;
- Geology and soils analysis, which will be of particular interest in relation to the creation of any proposed cattle holding facility, given the need to construct effluent ponds and water storages. Soil suitability will influence the configuration of such uses and indicate the site's susceptibility to erosion and potential sediment issues;
- Vegetation assessment, by way of detailed Vegetation Mapping resources, to determine whether the presence of any remnant vegetation will impact upon the site. The visual character and spatial definition of the site will be impacted by the amount and type of vegetation;
- Visual analysis, to determine potential impacts of any proposed land uses upon existing development, whether rural or urban; and
- Provision of and accessibility to infrastructure and services will determine the potential environmental and economic impacts of any proposed development.

4.0 Masterplan Outcomes

Utilising the results of the fore-mentioned research and site analysis, RPS proceeded with preparation of the masterplan for the site. As part of this process, we developed and investigated a total of five options, refer **Appendix 1**. After comparative review of each option, we decided to discard the first two options, on the grounds they were unrealistic, and then proceeded with refinement of the remaining three options. A summary of relevant features of each of these remaining options is provided in the following sections of this report.

4.1 Option 3

Relevant features, assumptions and design provisions that have been factored into Option 3 include:-

1. Stormwater quality will be managed on-site by each user;
2. A combination of Lidar sourced contours and Department of Natural Resources, Mines and Energy sourced information;
3. Creek centrelines are approximate only and mapped from DNRME sourced information. RPS have provisioned for 20 metre buffers to the minor drainage corridors and 30 metres buffer to Four Mile Creek. More detailed investigation is required to determine stream order categories and buffer widths;
4. Drainage corridors are preserved either via easement or dedication to Council;
5. All design options look to minimise crossing drainage corridors and optimising the developable area on each lot;
6. Clustering of smaller lots around Four Mile Creek and at the entrance roads. Larger lots are located at the edges to reduce servicing / infrastructure costs e.g. roads / water / power;
7. Manoeuvring by larger B-doubles will occur on-site;
8. All roads are a minimum 25 metre wide, with an 11 metres pavement. This may need to increase to 30m to facilitate cost effective stormwater design/management via swale drainage;
9. The major East / West road aligns with a drainage corridor. Creates some one side lots;
10. STP located at the lowest part of Four Mile Creek. It is assumed that the initial lots will have on-site sewer due to the development costs of an STP;
11. A major park node is located along Four Mile Creek and centred in Area B to allow optimised access for all industrial users. A small secondary park node is planned in Area A. A pedestrian connection will connect the major park node, the secondary park node to Racecourse Road, Racecourse and back to Georgetown;
12. Area A is assumed to be the initial staged delivery of the industrial area, minimising development costs;
13. A weigh bridge is located along the entry road to allow safe access / movements from the Highway (Gulf Development Road);
14. Clustering of the Cotton Ginney, silos, and cattle holding yards;
15. Allotment sizes are flexible and can be altered to suit future user groups; and



16. Area A entrance road is aligned with a small drainage corridor and terminated by the secondary park node

4.2 Option 4

In addition to retaining many of the feature, assumptions and design provisions incorporated into Option 3, Option 4 provides for the following design changes/refinements: -

1. The major East / West road has been realigned to ensure maximum allotment efficiency via an efficient road network;
2. Improved road safety via reduced road lengths, terminating at Four Mile Creek;
3. Relocated STP and Park node; and
4. Improved drainage solutions with reconfigured allotment layout in Area B.

4.3 Option 5

Option 5 retains many of the features, assumptions and design provisions that have been factored into Option 4, but has further refined Option 4 by incorporating: -

1. Improved road safety via reduced road lengths and alignment in Area A, terminating at Four Mile Creek; and
2. Area A road alignment is positioned to allow drainage connection to a smaller drainage corridor leading to Four Mile Creek.
3. Reduced length of one sided road/expanded road to ensure maximum return on infrastructure and lot yield.

We confirm the view of the study team that Option 5 – Drawing 141398-08, represents the preferred layout for the industrial precinct that best meets the study brief and optimises potential for the future development of the land into a major industrial node that will support and reinforce the evolution of Etheridge Shire into a major primary industry and agricultural production and processing area in the north.

We present the plan for Council consideration and would welcome the opportunity to provide further advice or assistance to advance this project.

Yours sincerely

RPS

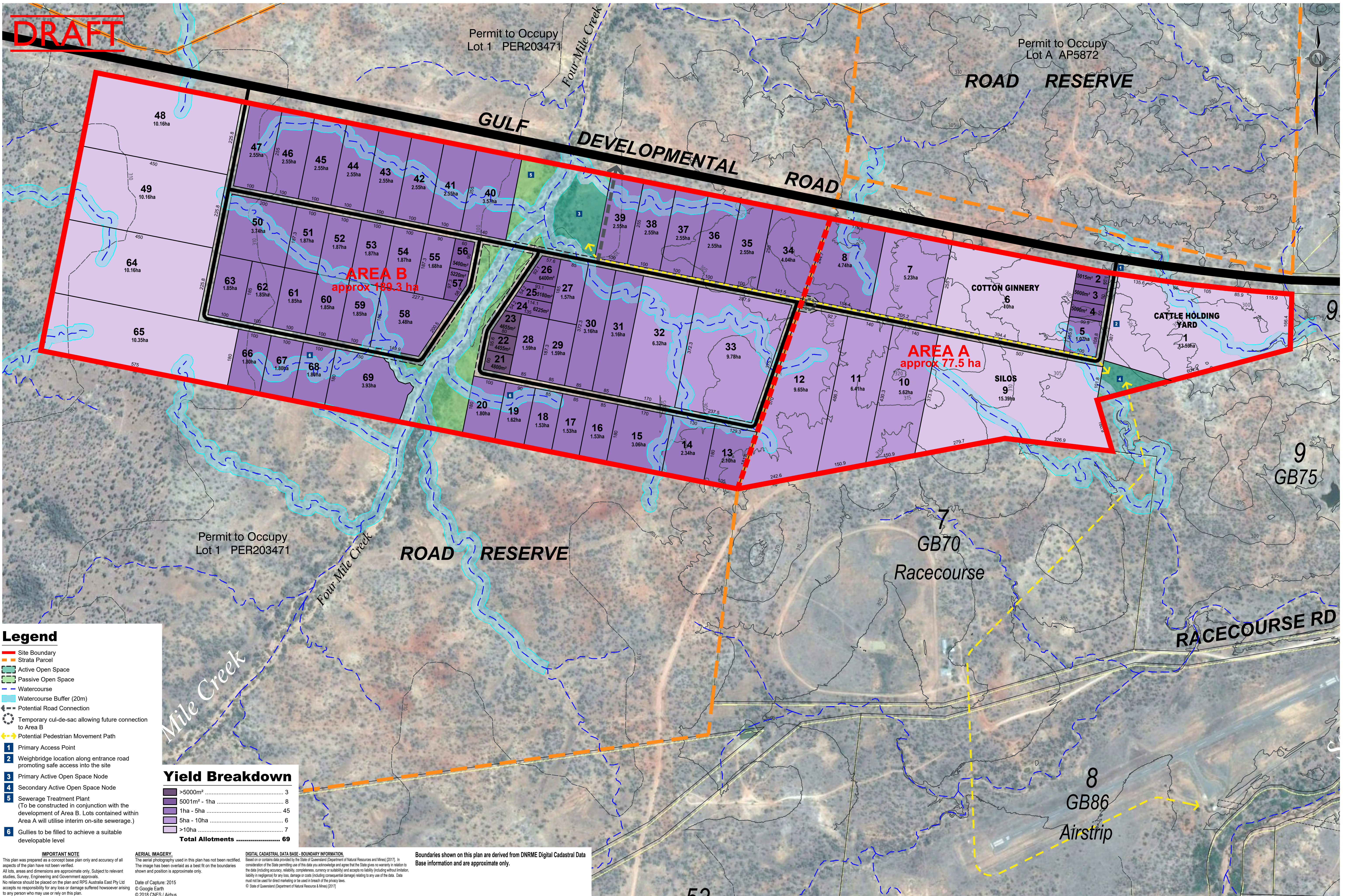
A handwritten signature in blue ink that reads 'M. Bolton'.

Matthew Bolton
Principal – Urban Design

Appendix A

Design options 1-5

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Legend

- Site Boundary
- Strata Parcel
- Active Open Space
- Passive Open Space
- Watercourse
- Watercourse Buffer (20m)
- Potential Road Connection
- Temporary cul-de-sac allowing future connection to Area B
- Potential Pedestrian Movement Path
- Primary Access Point
- Weighbridge location along entrance road promoting safe access into the site
- Primary Active Open Space Node
- Secondary Active Open Space Node
- Sewerage Treatment Plant
(To be constructed in conjunction with the development of Area B. Lots contained within Area A will utilise interim on-site sewerage.)
- Gullies to be filled to achieve a suitable developable level

Yield Breakdown

>5000m ²	3
5001m ² - 1ha	8
1ha - 5ha	45
5ha - 10ha	6
>10ha	7
Total Allotments	69

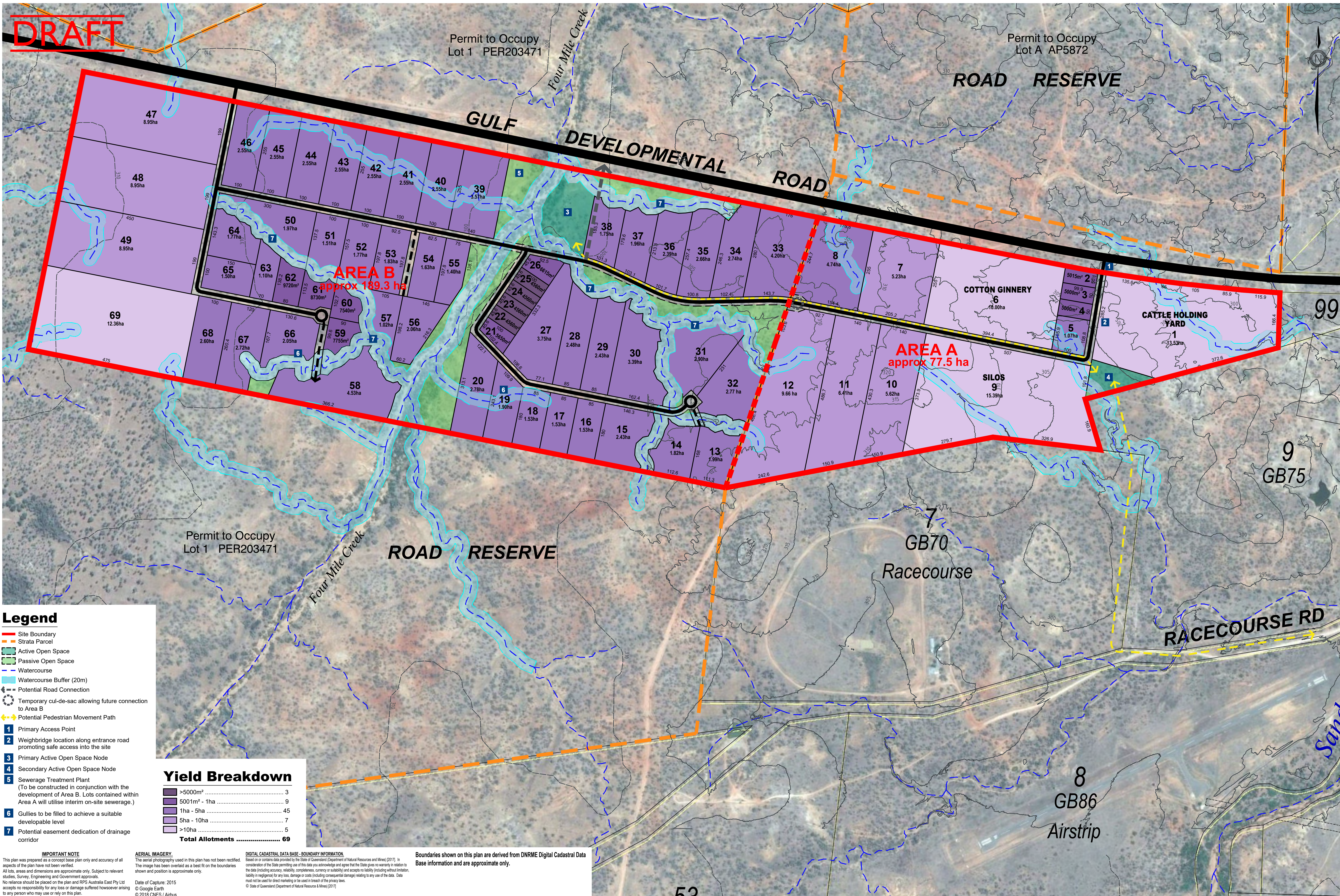
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Legend

- Site Boundary
- Strata Parcel
- Active Open Space
- Passive Open Space
- Watercourse
- Watercourse Buffer (20m)
- Potential Road Connection
- Temporary cul-de-sac allowing future connection to Area B
- Potential Pedestrian Movement Path
- 1 Primary Access Point
- 2 Weighbridge location along entrance road promoting safe access into the site
- 3 Primary Active Open Space Node
- 4 Secondary Active Open Space Node
- 5 Sewerage Treatment Plant (To be constructed in conjunction with the development of Area B. Lots contained within Area A will utilise interim on-site sewerage.)
- 6 Gullies to be filled to achieve a suitable developable level
- 7 Potential easement dedication of drainage corridor

Yield Breakdown

>5000m ²	3
5001m ² - 1ha	9
1ha - 5ha	45
5ha - 10ha	7
>10ha	5
Total Allotments	69

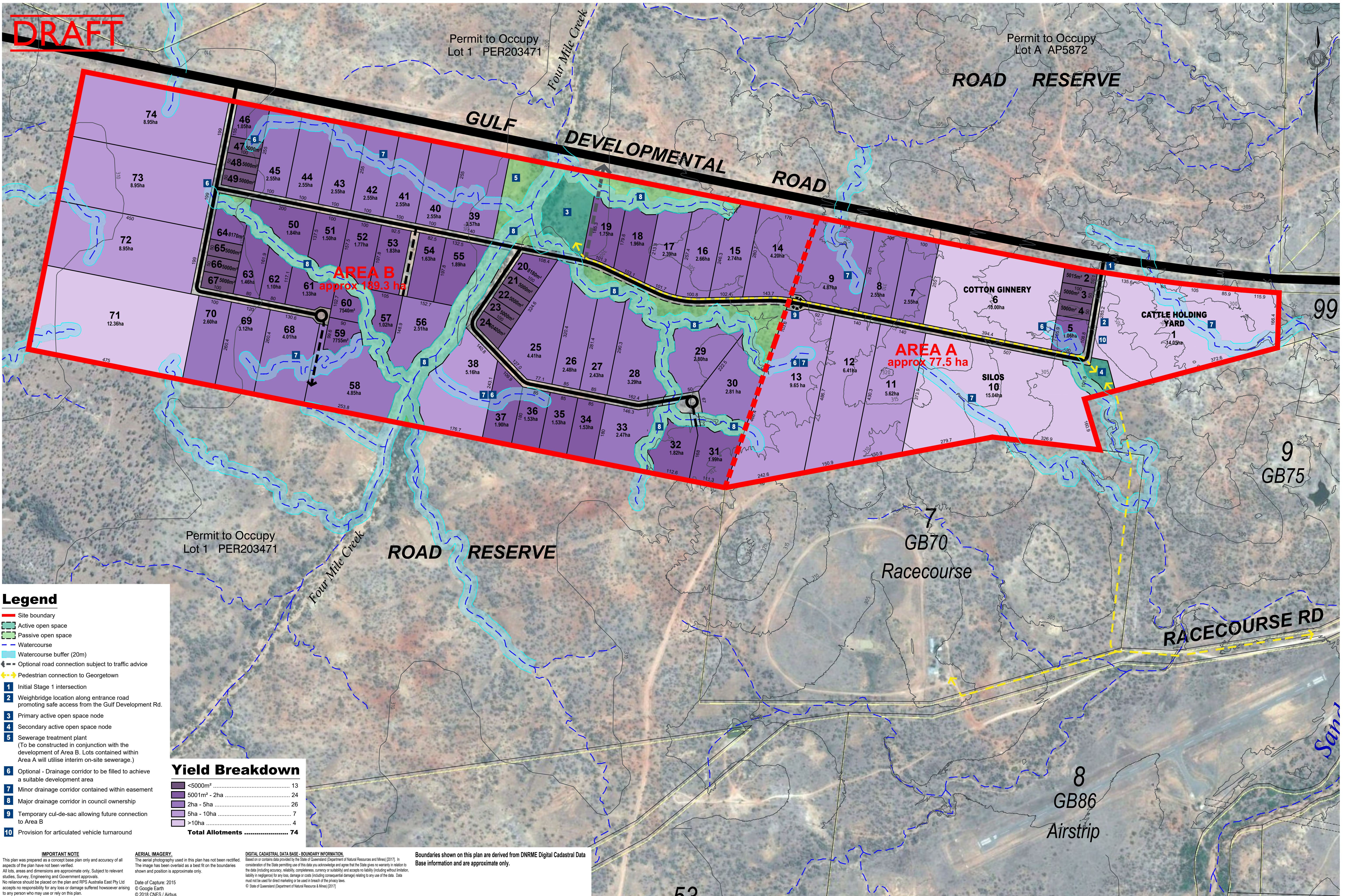
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- Legend**
- Site boundary
 - Active open space
 - Passive open space
 - Watercourse
 - Watercourse buffer (20m)
 - Optional road connection subject to traffic advice
 - Pedestrian connection to Georgetown
 - Initial Stage 1 intersection
 - Weighbridge location along entrance road promoting safe access from the Gulf Development Rd.
 - Primary active open space node
 - Secondary active open space node
 - Sewerage treatment plant (To be constructed in conjunction with the development of Area B. Lots contained within Area A will utilise interim on-site sewerage.)
 - Optional - Drainage corridor to be filled to achieve a suitable development area
 - Minor drainage corridor contained within easement
 - Major drainage corridor in council ownership
 - Temporary cul-de-sac allowing future connection to Area B
 - Provision for articulated vehicle turnaround

Yield Breakdown

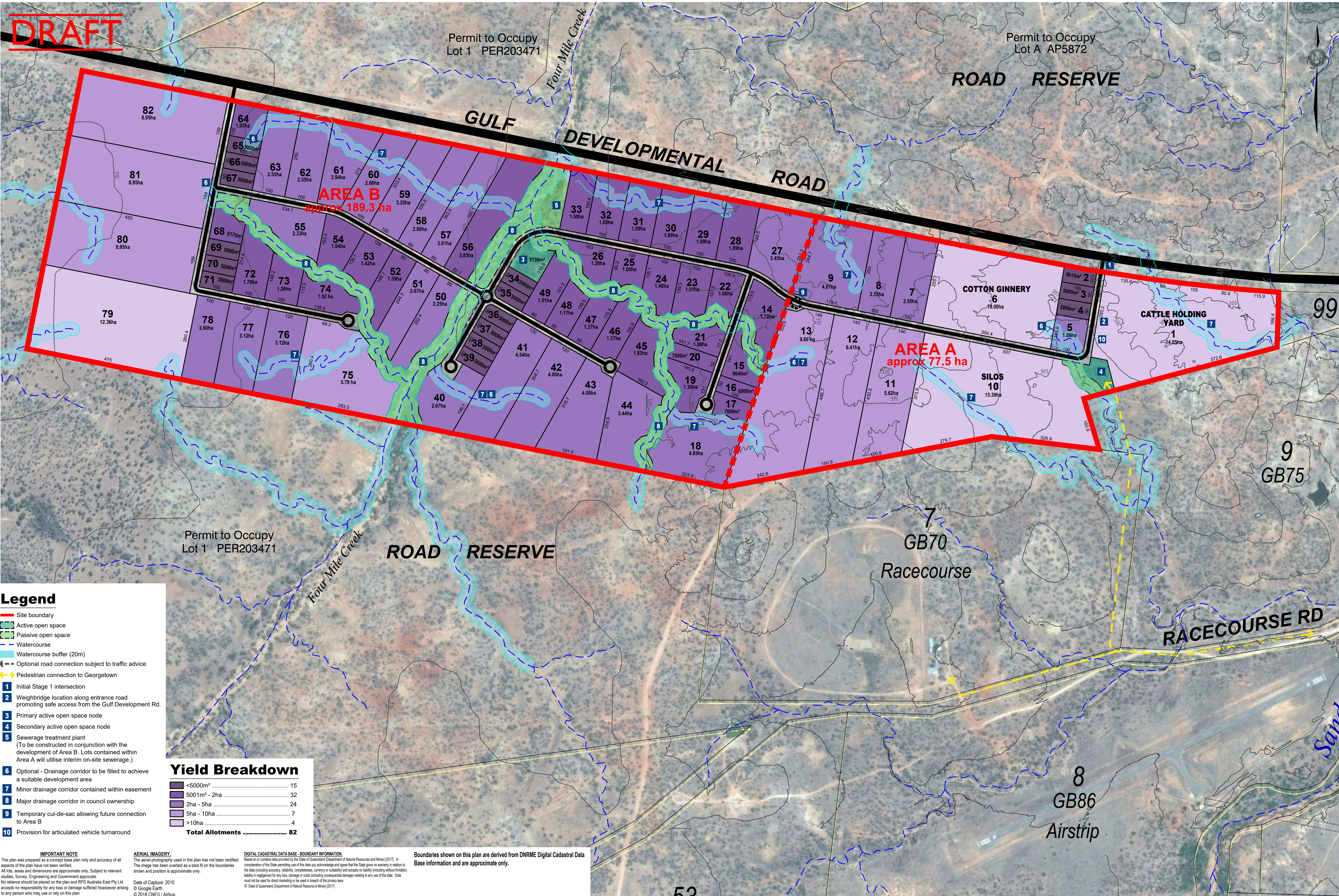
<5000m ²	13
5001m ² - 2ha	24
2ha - 5ha	26
5ha - 10ha	7
>10ha	4
Total Allotments	74

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 - Minor drainage corridor contained within easement
 - Major drainage corridor in council ownership
 - Temporary cul-de-sac allowing future connection to Area B
 - Provision for articulated vehicle turnaround

Yield Breakdown

<5000m ²	15
5001m ² - 2ha	32
2ha - 5ha	24
5ha - 10ha	7
>10ha	4
Total Allotments	82

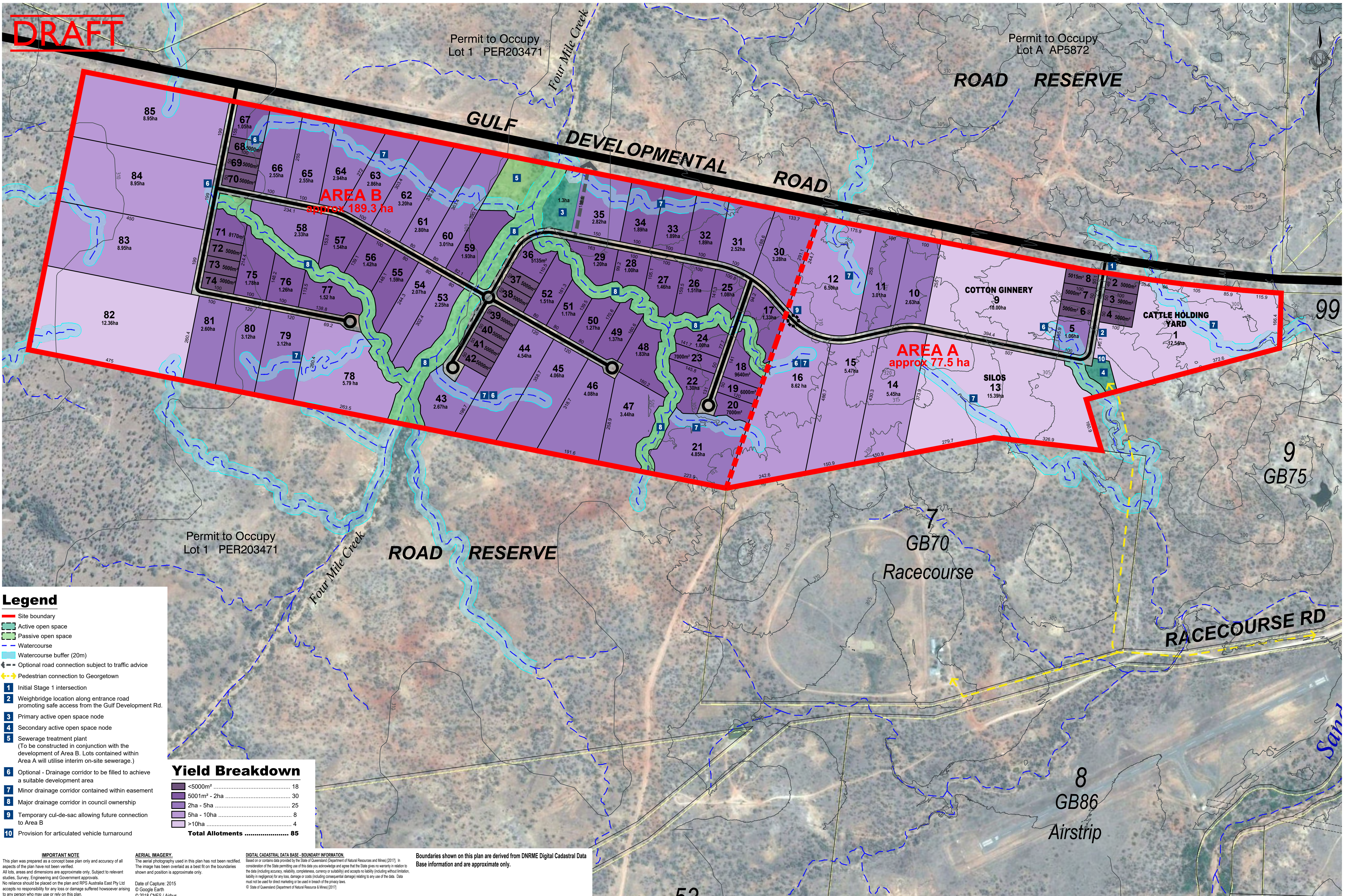
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GEORGETOWN INDUSTRIAL INVESTIGATION AREA - CONCEPT MASTERPLAN - OPTION 5

ETHERIDGE SHIRE COUNCIL