Development Application

Addendum Statement of Environmental Effects

Bingara Gorge, Wilton

Development Application: Additional 635 Lot Yield to a Maximum 1,800 Lots, Clearing of Vegetation, Fire Trails & 15 Lot Subdivision (Stage 1J(2))

On Behalf of Lendlease Communities Pty Ltd

November 2015 ■ 15556

JBA Urban Planning Consultants Pty Ltd ABN 84 060 735 104 / North Sydney t +61 2 9956 6962 w jbaurban.com.au

JBA operates under a Quality Management System that has been certified as complying with ISO 9001:2008. This report has been prepared and reviewed in accordance with that system. If the report is not signed below, it is a preliminary draft.

This report has been prepared and finalised by:

Lesley Bull 25/11/2015

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1.0 Introduction

A Development Application (DA) in accordance with Section 83B of the Environmental Planning & Assessment Act 1979 (EP&A Act) was submitted to Wollondilly Shire Council (WSC) by Lendlease in relation to certain land at Bingara Gorge, Wilton on 24 April 2015 (Council reference 283/2015).

The DA was referred by Council to concurrence authorities and was also publicly exhibited for an extended notification period of 23 days between 15 July and 6 August 2015.

On 25 June 2015, Lendlease lodged an appeal in the NSW Land and Environment Court (LEC) in relation to the deemed refusal of the DA 283/2015 (Matter No. 15/10554).

A Section 34 Conciliation Conference was held on 22 October 2015.

Following, and in response to the Section 34 Conciliation Conference, Lendlease proposed to the Council Subdivision Plans in relation to the inclusion of subdivision for 15 lots in the DA.

This Addendum Statement of Environmental Effects (SEE) has been prepared by JBA to address the Subdivision Plans and also to provide additional information and updated plans in relation to certain issues set out in the Statement of Facts and Contentions of WSC in relation to Matter No. 15/10554).

The author of this Addendum SEE has read and understood the Expert Witness Code of Conduct and has prepared the Addendum SEE in accordance with that Code. A copy of the author's CV is included at **Appendix A**.

1.1 Background

The DA follows the determination in 2006 of an earlier staged DA for the Bingara Gorge Project (ID993-05) which gave approval for:

- The use of the land for the purposes (and generally in the areas) shown on the Concept Plan for the site:
  - Housing;
  - Open space;
  - A mixed use village centre, incorporating but not limited to, commercial and retail uses;
  - Community facilities;
  - Recreational facilities (such as the gold course);
  - Landscaped streets and access paths;
  - A sewerage treatment plant and treated waste water reuse scheme;
  - Utility services.
- 1,165 residential lots with the minimum lot sizes as shown on the Concept Plan.

The earlier Staged Development Consent ID993-05 is referred to herein as the 'master plan consent ID993-05'.

The Concept Plan, approved as part of the master plan consent ID993-05 and referred to in the notice of determination, is reproduced at **Figure 1** below.

The approved Concept Plan shows the footprint of the areas of the Bingara Gorge site that are permitted to be developed for up to 1,165 residential lots (areas 1 to 5); as well as those areas of the Bingara Gorge site that are to be conserved as Environmental Protection and Recreation Land (EP&R Land) (area 7). Across areas 1 to 5 the Concept Plan contemplates minimum lot sizes ranging from 250 m^2 to 4,000m^2.

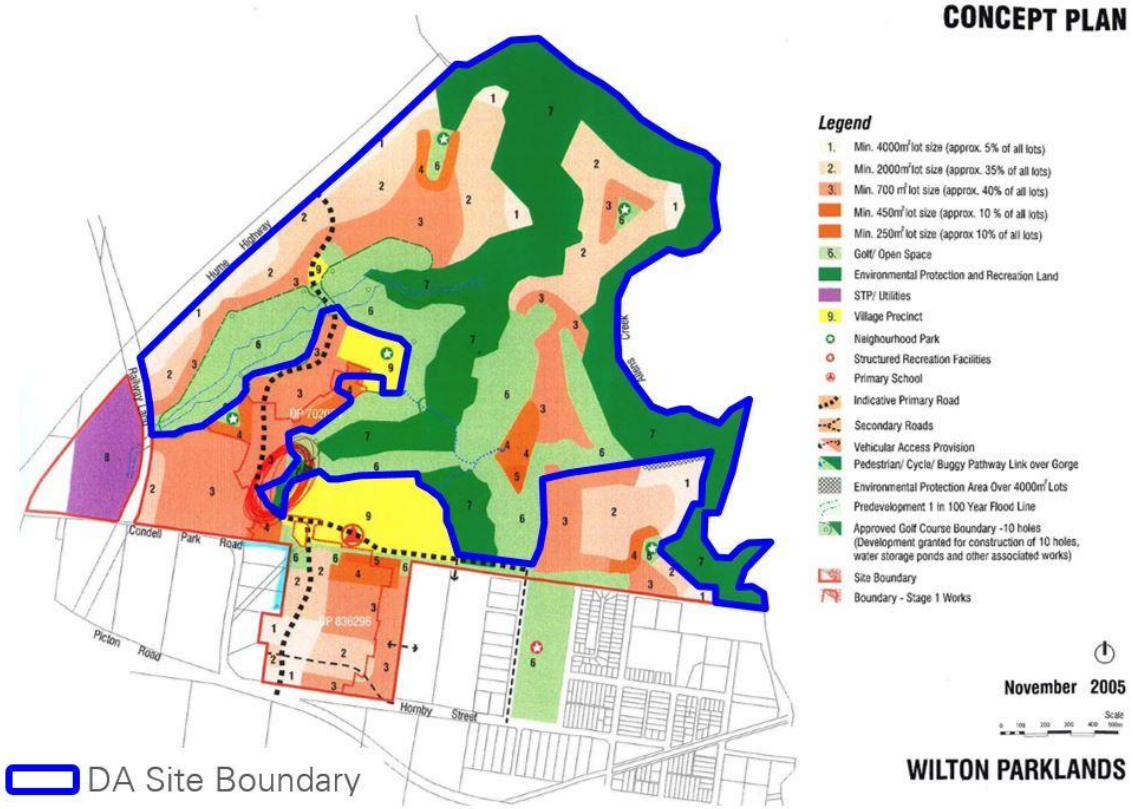

Figure 1 – Approved Concept Plan under master plan consent ID993-05

The subject DA relates to land that is within the boundary of the master plan consent ID993-05 and that is not already the subject of a detailed application for residential subdivision / construction works.

The boundary of this DA in relation to the Concept Plan approved under the master plan consent ID993-05 is shown as a heavy blue line on **Figure 1**.

Since grant of the master plan consent ID993-05 in 2006, development has substantially commenced on the site. To date, Lendlease has obtained development consent for 896 residential allotments, and has lodged DAs for a further 77 residential allotments under the umbrella of and within the maximum 1,165 dwelling yield permitted under the master plan consent ID993-05.

Figure 2 shows the DA boundary in relation to the detailed subdivision that has already been approved / proposed by lodged DA under the master plan consent ID993-05.

The Bingara Gorge site is separated into 9 residential precincts. The 9 residential precincts are shown on **Figure 3** below.

Figure 2 – DA site boundary in relation to detailed subdivision approvals / lodged DAs under master plan consent ID993-05 (boundary shown in red)
Source: Lend Lease

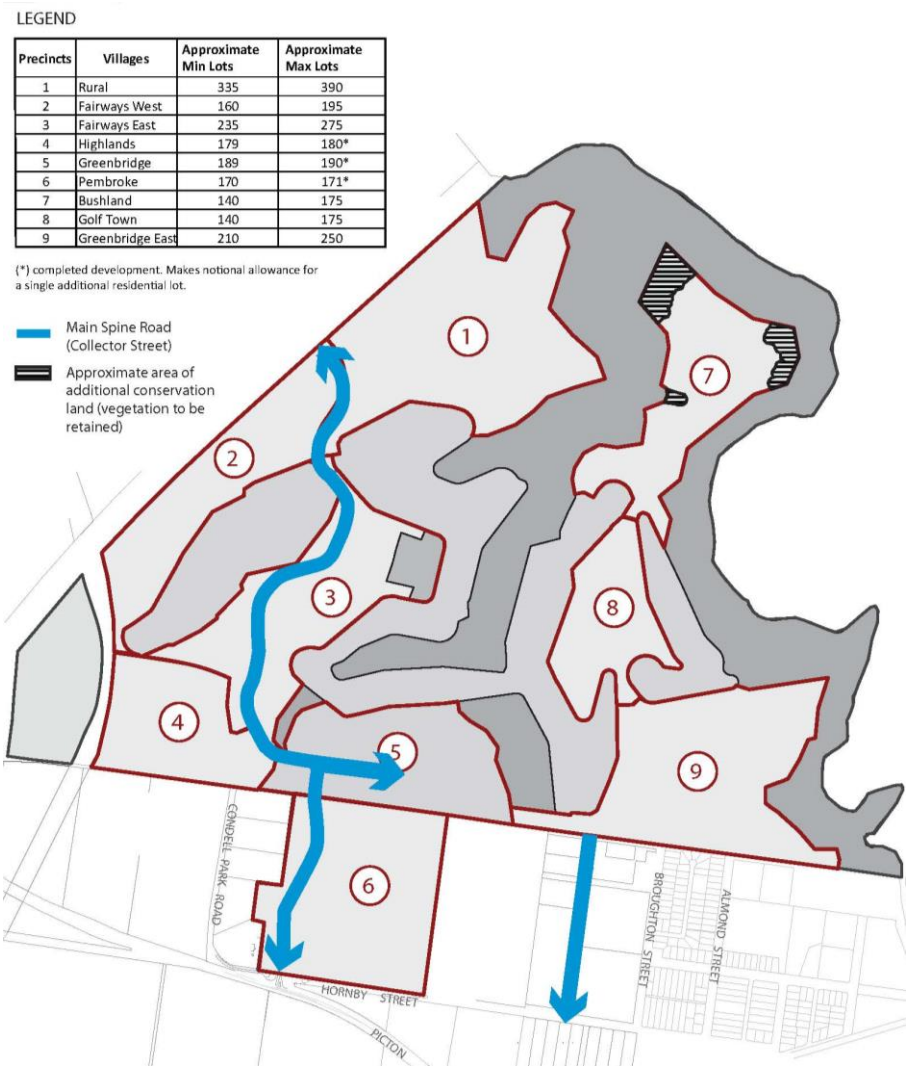

Figure 3 – Bingara Gorge residential precincts
Source: Lend Lease

1.2 Amendments to DA 283/2015

As originally submitted to Council in April 2015, the DA proposed an increase in the residential yield permitted on the site under master plan consent ID993-05 from 1,165 residential lots to a maximum of 1,800 residential lots, along with minimum and maximum lot yields within identified development precincts and development guidelines for future residential subdivision applications, the removal of certain vegetation and construction of fire trails.

Since the Section 34 Conciliation Conference, the following key amendments have been made to the DA:

- subdivision of an area of land located within precinct 3 into 15 allotments has been included;
- a further plan detailing the alignment of proposed fire trails has been prepared;
- further ecological survey and assessment work undertaken in response to issues raised by WSC has resulted in a 5ha reduction in the area of land within precinct 7 (Bushland) that is proposed to be cleared. As such, the Vegetation Removal Plan prepared by Eco Logical has been amended.

In summary, as amended, the DA seeks consent for:

- subdivision of one proposed lot approved as part of DA 010.2013.411.001 (located within development precinct 3 (Fairways East)) into 15 residential lots (referred to herein as 'Stage 1J(2)');
- concept approval for a maximum 812 lots, to be located within the combined area of development precincts 1 (Rural), 2 (Fairways West), 7 (Bushland) and 8 (Golf Town) resulting in a maximum of 1,800 lots across the overall Bingara Gorge site;
- concept approval for a minimum and maximum lot yield within development precincts 1, 2, 7 and 8 as shown on the Proposed Lot Yield Distribution Plan;
- removal of vegetation within the developable footprint of precincts 1, 2, 7 and 8 as shown on the updated Vegetation Removal Plan prepared by Eco Logical;
- construction of pedestrian, cycle and fire trails within the Environmental Protection and Recreation Lands and associated removal of up to 1.2 ha of vegetation as shown on the Fire Trails Plan and Vegetation Removal Plan prepared by Eco Logical; and
- Development guidelines to guide future detailed residential subdivision DAs within development precincts 1, 2, 7 and 8.

It is noted that inclusion of the proposed 15 lot residential subdivision has resulted in a minor adjustment to the boundary of the DA as compared to that originally submitted in April 2015.

1.3 Addendum SEE

This Addendum SEE addresses the amended development proposal as depicted in the amended plans.

The Addendum SEE includes the following additional information that was identified during the Section 34 Conciliation Conference as being required in relation to the inclusion of the 15 lot subdivision, and also to address certain issues raised by WSC in the Statement of Facts and Contentions:

- Updated Plans prepared by Lendlease (**Appendix B**);
- Updated Vegetation Removal Plan prepared by Ecological (**Appendix C**);
- Fire Trail Alignment Plan prepared by Ecological dated November 2015 (**Appendix D**);
- Subdivision and Civil Plans prepared by Cardno dated November 2015 (including Tree Removal Plan and Driveway Location Plan) (**Appendix E**);
- Updated compliance assessment in relation to Sydney Regional Environmental Plan No.20, Wollondilly Local Environmental Plan 2011 and Wollondilly Council Development Control Plan 2010 (**Appendix F**);
- Updated Ecological Assessment Report prepared by Ecological dated November 2015 (**Appendix G**);
- Updated Transport Assessment prepared by Cardno dated November 2015 (**Appendix H**);
- Updated Flooding, Stormwater and Water Quality Management Strategy prepared by J Wyndham Prince dated November 2015 (**Appendix I**);
- Cultural Heritage Assessment Report – Fire Trails prepared by Kyandel dated November 2015 (**Appendix J**);
- Mine Subsidence Board Letter dated 13 July 2015 (**Appendix K**);

- Bushfire Assessment in relation to the proposed 15 lot subdivision prepared by Eco Logical dated November 2015 (**Appendix L**);
- Assessment in relation to any relevant acoustic requirements relating to the development consent for the Country Club, and the risk assessment for the Golf Course (**Sections 3.82** and **8.83**).

Overlay plans providing information with respect to the relationship between the location of proposed fire trails and significant vegetation and aboriginal archaeology are included in the updated Ecological Assessment and Cultural Heritage Assessment Report.

A contaminated land assessment (in relation to the area of land to be subdivided into 15 lots) is to be submitted under separate cover.

The scope of further information provided within the transport, ecology, stormwater and archaeology reports has been prepared in consultation with representatives of WSC.

This Addendum SEE provides an updated description of the proposed development and an updated assessment of relevant matters under Section 79C of the EP&A Act.

The Addendum SEE should be read in conjunction with the full SEE prepared by JBA dated 15 April and in particular in conjunction with the following reports and information appended to the April 2015 SEE that have not been re-produced in this Addendum SEE:

- Appendix B Notice of Determination in relation to staged DA ID993-05
- Appendix D VPA Heads of Terms and Schedules
- Appendix F Development Guidelines
- Appendix K Utility Services Investigation
- Appendix L Aboriginal Cultural Heritage Report (relating to development precincts)
- Appendix M Community Facilities and Open Space Report

The above documentation continues to form part of the DA.

2.0 Updated Development Description

Development consent is sought for the following in relation to the land to which the DA relates:

- subdivision of one proposed lot approved as part of DA 010.2013.411.001 (located within development precinct 3 (Fairways East)) into 15 residential lots (referred to herein as 'Stage 1J(2)');
- concept approval for a maximum 812 lots, to be located within the combined area of development precincts 1 (Rural), 2 (Fairways West), 7 (Bushland) and 8 (Golf Town) resulting in a maximum of 1,800 lots across the overall Bingara Gorge site;
- concept approval for a minimum and maximum lot yield within development precincts 1, 2, 7 and 8 as shown on the Proposed Lot Yield Distribution Plan;
- removal of vegetation within the developable footprint of precincts 1, 2, 7 and 8 as shown on the updated Vegetation Removal Plan prepared by Eco Logical;
- construction of pedestrian, cycle and fire trails within the Environmental Protection and Recreation Lands and associated removal of up to 1.2 ha of vegetation as shown on the Fire Trails Plan and Vegetation Removal Plan prepared by Eco Logical; and
- Development guidelines to guide future detailed residential subdivision DAs within development precincts 1, 2, 7 and 8.

A Concept Plan illustrating the conceptual subdivision layout for future proposed development together with the approved / subject to lodged DA subdivision layout is included below at **Figure 4**. The Concept Plan is indicative only. The final number and layout of lots within each precinct will be determined at the detailed subdivision DA stage. The Concept Plan also shows the approximate extent of the 5ha area within precinct 7 that is no longer proposed to be cleared, consistent with the area of vegetation to be retained shown on the Vegetation Removal Plan (refer to **Figure 6**).

The increased residential yield that is the subject of this DA sits wholly within the urban footprint that is already approved under the master plan consent ID993-05. Elements of the proposed fire trails are located partially within the EP&R Lands (consistent with WSC's Development Control Plan 2011).

It is proposed that the grant of consent to the DA be subject to a condition, imposed pursuant to 80A(1)(b) of the EP&A Act, modifying the master plan consent ID993-05 to achieve consistency between the two instruments. Following the grant of consent, the requisite notice under Clause 97 of the Environmental Planning and Assessment Regulation 2000 will be submitted to Council.

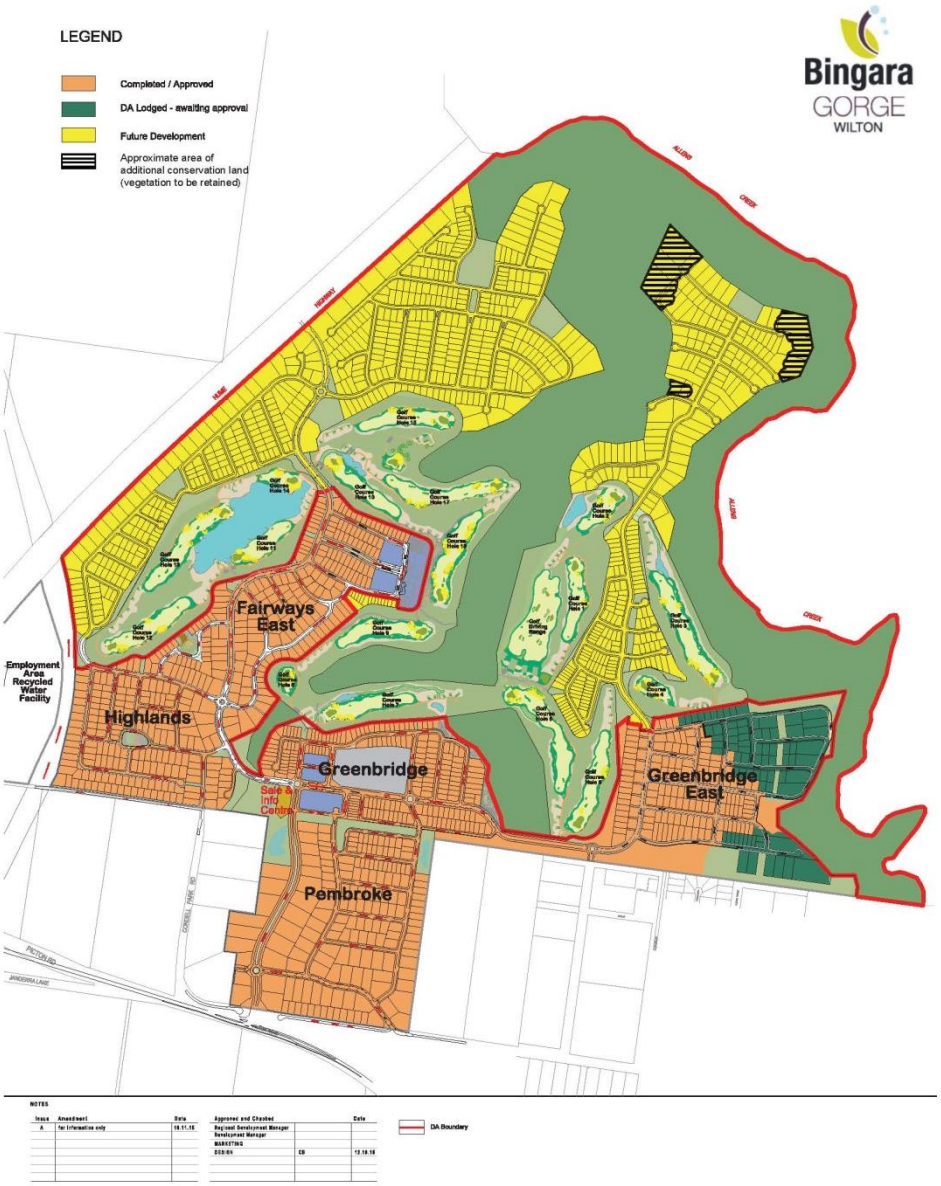

Figure 4 – Illustrative Concept Plan showing existing and proposed future development
Source: Lendlease

2.1 Increase in Residential Yield

The land to which this DA relates includes residential precincts 1, 2, 8 and 7 and a small part of precinct 3 as shown on **Figure 3**.

DAs have already been approved and/or lodged for 973 lots within residential precincts 3, 4, 5, 6 and 9. This leaves capacity for up to 192 further lots to be provided within the total 1,165 lots currently allowed for under the master plan consent ID993-05.

The proposed development seeks consent for:

- Subdivision for 15 additional lots within precinct 3. The 15 lots are within the 1,165 lots currently allowed for under the master plan consent ID993-05; and
- Concept approval for a total of 812 lots within residential precincts 1, 2, 8 and 7.

This will result in the existing residential lot yield on the broader Bingara Gorge site increasing from 1,165 residential lots to a maximum of 1,800 residential lots.

2.2 Lot Yield Distribution

In conjunction with the proposed increase in residential lot yield within residential precincts 1, 2, 7 and 8, a minimum and maximum range of residential lots is proposed within each precinct (refer to **Figure 5** below).

The lot range for each precinct is proposed in order to illustrate how the additional lots will be accommodated within the existing development footprint relating to precincts 1, 2, 7 and 8, and to identify the general outcome with respect to future residential densities within each precinct area.

The final number of residential lots, and proposed lot sizes accommodated within precincts 1, 2, 7 and 8 will be determined at the future detailed subdivision application stages within the maximum total 812 lots allowed for within those precincts (remaining within the maximum 1,800 lots allowed for across the overall Bingara Gorge site).

No change is proposed to the lot yield approved for precincts 3, 4, 5, 6 and 7 under the master plan consent ID993-05. The proposed 15 lots in Stage 1J(2) is within the 1,165 lots already provided for and development of this land will otherwise continue as approved under the master plan consent ID993-05.

The minimum lot sizes shown in the Concept Plan approved under the master plan consent ID993-05 (refer to **Figure 1**) are to be removed and replaced with the lot range for each precinct shown on **Figure 5**.

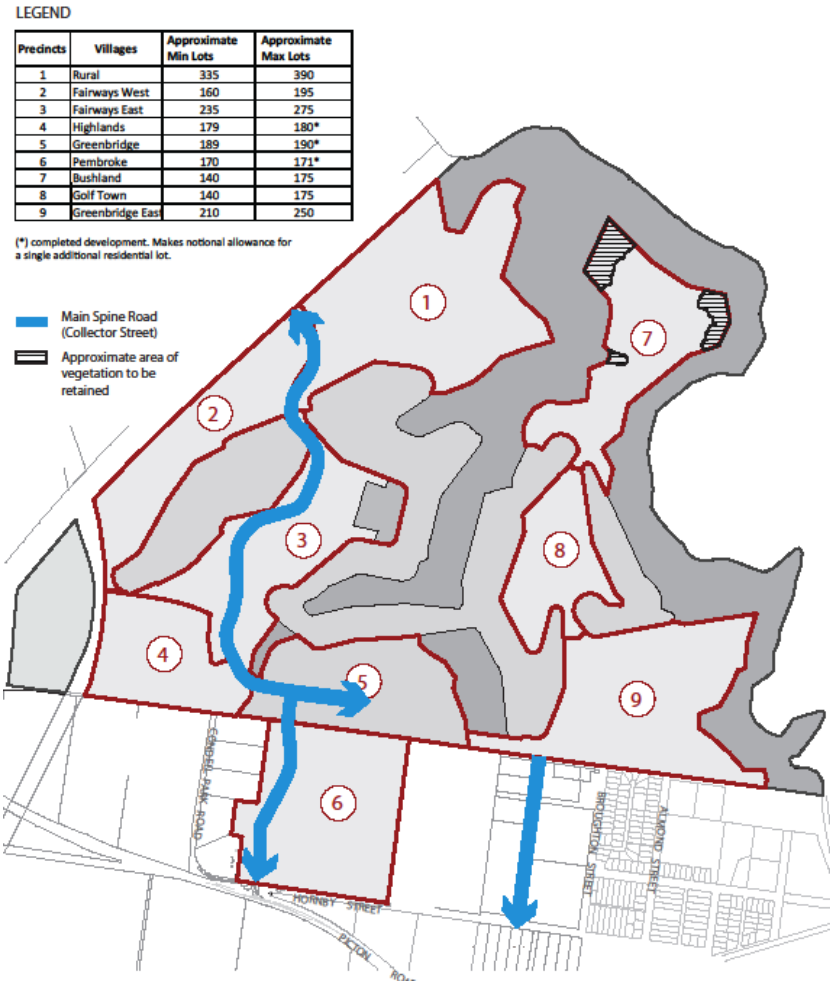

Figure 5 – Proposed Lot yield distribution
Source: Lend Lease

2.3 Vegetation Removal – Development Footprint

The master plan consent ID993-05 approved the development of the land in accordance with the Concept Plan which detailed the provision of up to 1,165 dwellings within a mapped developable footprint on the site (refer to Approved Concept Plan at **Figure 1**).

This DA proposes the removal of 34.34 ha of vegetation within residential precincts 1, 2, 7 and 8 for which in principle approval has been granted under the master plan consent ID933-05.

The extent of vegetation to be removed is shown on the Vegetation Removal Plan prepared by Ecological reproduced at **Figure 6** below and included at **Appendix C**. It is noted that Figure 6 also shows the vegetation to be removed to accommodate fire trails within the EP&R Lands as described at Section 2.4 below.

The total 35.54 hectares referenced on **Figure 6** includes the 34.34 ha to be removed within the development precincts and a further up to 1.2 ha to be removed within the EP&R Lands.

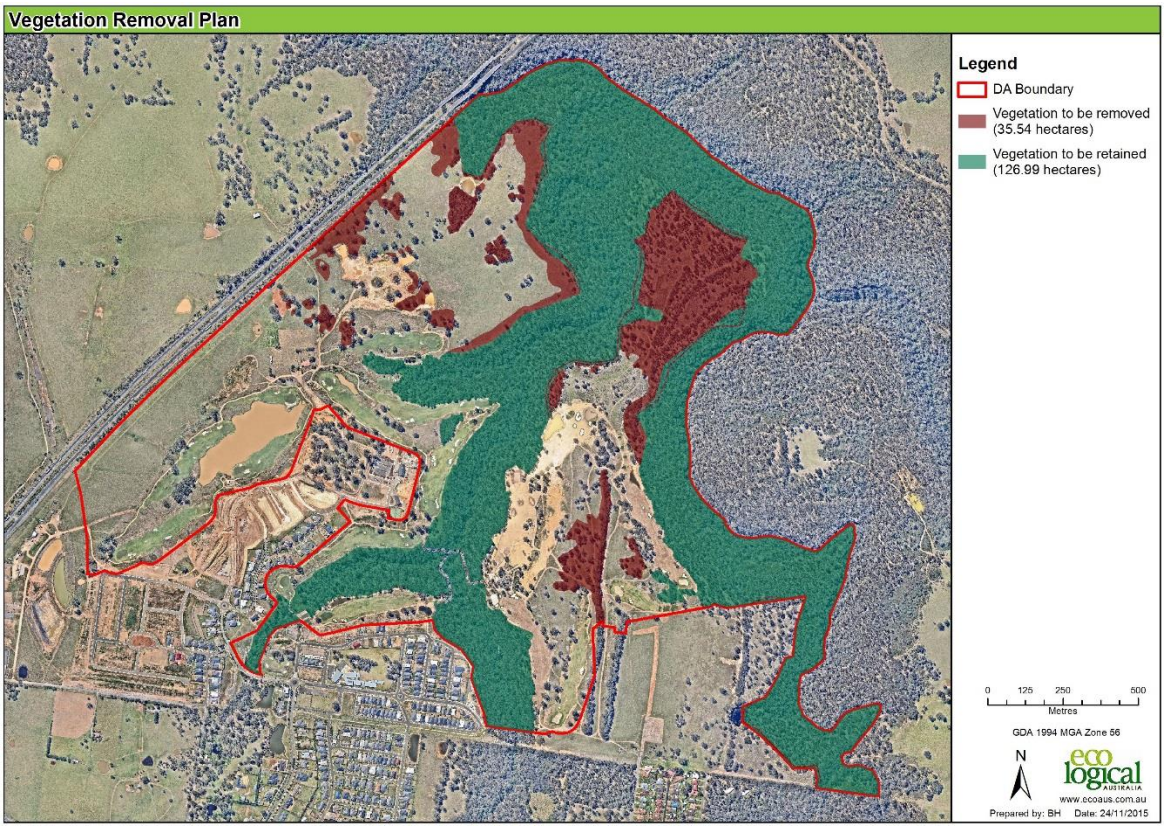

Figure 6 – Updated Vegetation Removal Plan
Source: Eco Logical

Further detail on the quantum and categorisation of vegetation to be removed is provided in the updated Ecology Assessment prepared by Ecological included at **Appendix G**.

2.4 Fire Trails & Associated Vegetation Removal

The site specific development controls for Bingara Gorge (included within Volume 7 – Site Specific – Wilton Park of Wollondilly DCP 2011) allow for shared pedestrian / cycle paths / fire trails within the Environmental Protection and Recreation Land (refer to Figure 3 Pedestrian and Cycle Paths Networks found at section 6.5 of DCP 2011). The fire trails permitted under DCP 2011 within the Environmental Protection and Recreation Land are generally located around the perimeter of precincts 1, 7 and 9.

This DA seeks consent for the location and physical construction of pedestrian, cycle and fire trails within the EP&R Land where such trails have not yet been approved as part of detailed subdivision applications. The proposed fire trail alignments are shown on the Fire Trails Plan prepared by Eco Logical reproduced at **Figure 7** below (refer also to Plans included at **Appendix D**).

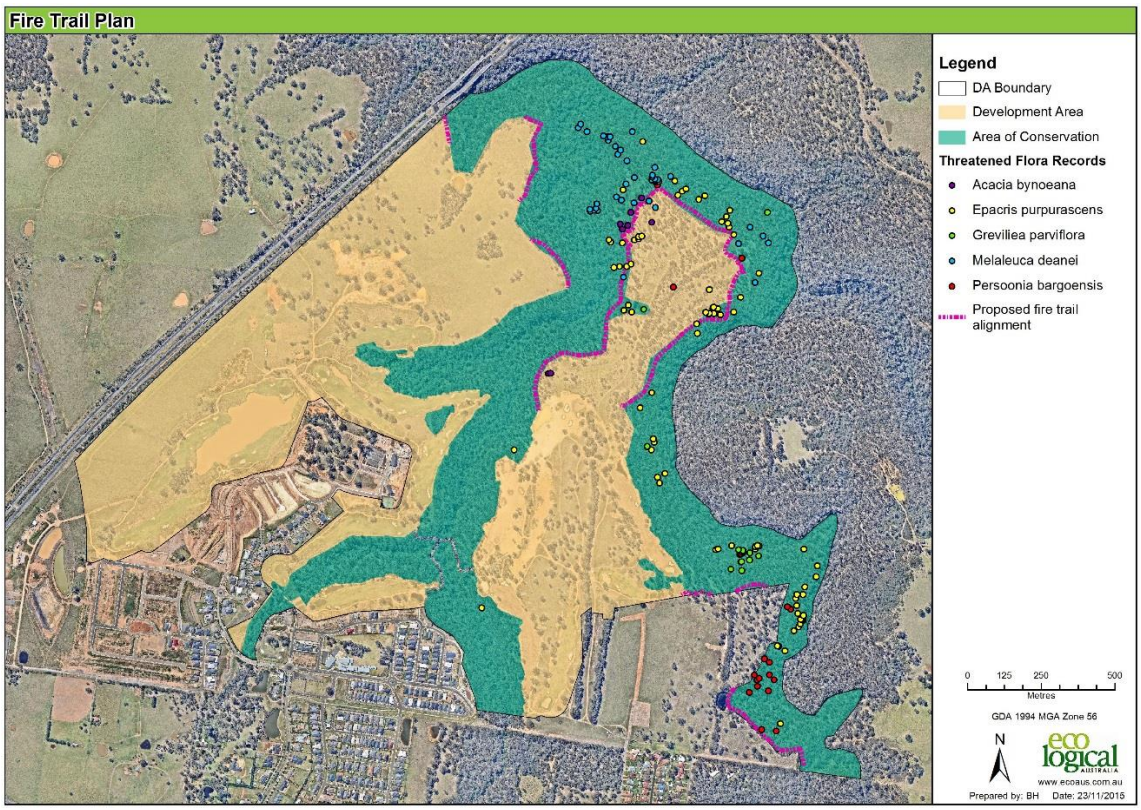

Figure 7 – Proposed Fire Trail Alignment
Source: Eco Logical

The fire trails will be constructed in accordance with the minimum standards set out in Planning for Bushfire Protection (refer to extract at **Figure 8** below) with materials selection to ensure that the trails are trafficable under all weather conditions.

Cross sections of the proposed fire trail construction are included in the Ecology Assessment at **Appendix G**.

Performance Criteria	Acceptable solutions
The intent may be achieved where:	
• the width and design of the fire trails enables safe and ready access for firefighting vehicles	• a minimum carriageway width of four metres with an additional one metre wide strip on each side of the trail (clear of bushes and long grass) is provided. • the trail is a maximum grade of 15 degrees if sealed and not more than 10 degrees if unsealed. • a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches is provided. • the crossfall of the trail is not more than 10 degrees. • the trail has the capacity for passing by: - reversing bays using the access to properties to reverse fire tankers, which are six metres wide and eight metres deep to any gates, with an inner minimum turning radius of six metres and outer minimum radius of 12 metres; and/or - a passing bay every 200 metres, 20 metres long by three metres wide, making a minimum trafficable width of seven metres at the passing bay. *Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m) and extend for no more than 30m and where obstruction cannot be reasonably avoided or removed.*
• fire trails are trafficable under all weather conditions. Where the fire trail joins a public road, access shall be controlled to prevent use by non authorised persons.	• the fire trail is accessible to firefighters and maintained in a serviceable condition by the owner of the land. • appropriate drainage and erosion controls are provided. • the fire trail system is connected to the property access road and/or to the through road system at frequent intervals of 200 metres or less. • fire trails do not traverse a wetlands or other land potentially subject to periodic inundation (other than a flood or storm surge). • gates for fire trails are provided and locked with a key/lock system authorized by the local RFS.
• fire trails designed to prevent weed infestation, soil erosion and other land degradation	• fire trail design does not adversely impact on natural hydrological flows. • fire trail design acts as an effective barrier to the spread of weeds and nutrients. • fire trail construction does not expose acid-sulphate soils.

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Figure 8 – Extract from Planning for Bushfire Protection Minimum Standards for Fire Trails
Source: Eco Logical

The construction of the pedestrian, cycle and fire trails within the EP&R Land will require the removal of vegetation. This DA proposes the removal of a maximum of 1.2 hectares of vegetation for this purpose. This maximum area could be reduced further during detailed design of adjacent subdivision areas.

The area of vegetation to be removed for fire trails is included in the 35.54 ha shown on the Vegetation Removal Plan at **Figure 6** above.

Further detail on the quantum and categorisation of vegetation to be removed is provided in the updated Ecology Assessment prepared by Ecological included at **Appendix G**.

2.5 Subdivision (Stage 1J(2))

This DA seeks consent for the subdivision of a proposed lot - approved as part of DA 010.2013.411.001 (relating to Fairways East, Stages 1A, 1B, 1C) - into 15 residential lots.

The area of proposed subdivision and the subdivision layout is shown on **Figure 9** below and in detail on the Subdivision and Civil Plans prepared by Cardno (**Appendix E**).

The area of land to be subdivided is referred to as Stage 1J(2) and is located within precinct 3 (Fairways East) on The Irons Drive generally between the Country Club and Ambrose Drive.

Specifically, this component of the proposed development includes:

- subdivision to create 15 residential lots and provision for driveway crossings from The Irons Drive;
- removal of existing vegetation, including low level vegetation and four trees on the eastern part of the existing lot;
- regarding of the site, minor cut and fill to level the site; and
- civil works:
  - Connection to stormwater drainage; and
  - Connection to utilities services (including potable and recycled water reticulation, sewage, power, gas and telecommunications).

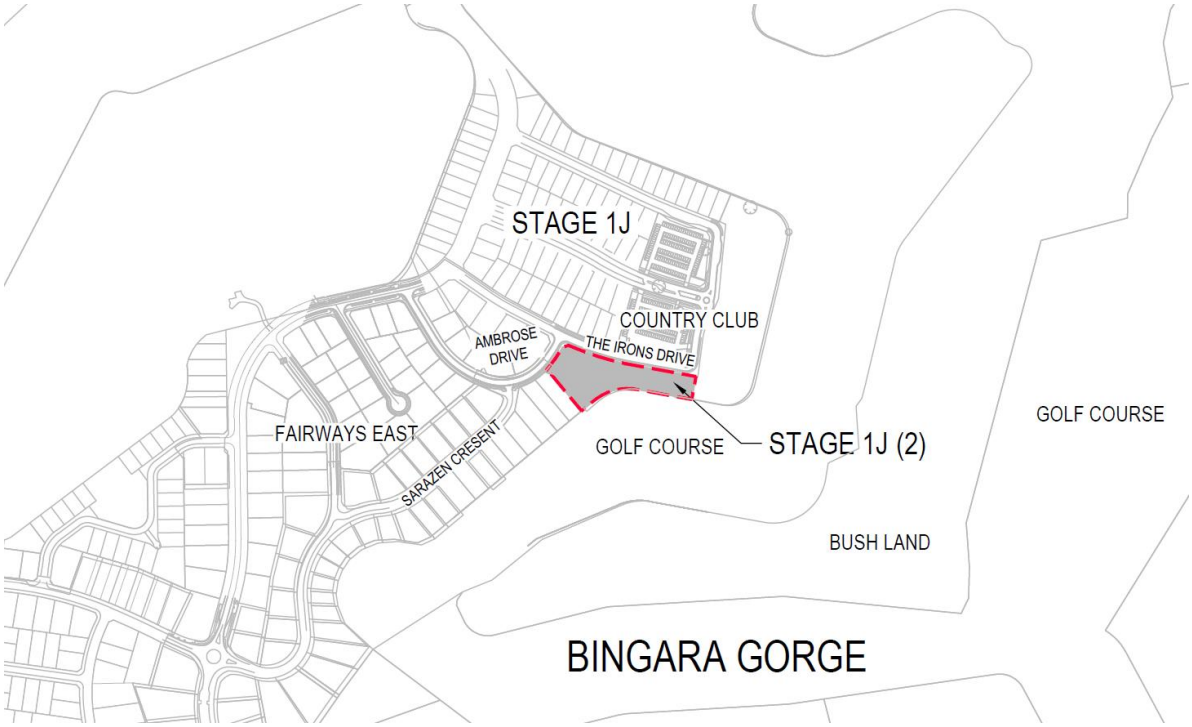

Figure 9 – Area of proposed subdivision
Source: Cardno

2.5.1 Subdivision Pattern

The proposed subdivision will create a total of 15 residential lots, ranging in size from 258.4sqm (Lot 3) to 1389.5sqm (lot 1). The lots proposed are generally rectangular in shape, with all having direct access to the street front and suitable location for driveway crossings.

The minimum frontage dimension of the proposed lots is 10m. All lots, with exception of Lot 1 have frontage to The Irons Drive, with Lot 1 having frontage to Ambrose Drive. 10 of the proposed lots have a rear boundary to the Bingara Gorge Golf Course lane, as shown in **Figure 10**.

Figure 10 – Proposed subdivision
Source: Cardno

2.5.2 Bulk Earthworks

Civil Engineering Plans prepared by Cardno illustrating the areas of the site subject to earthworks including cut and fill are included at **Appendix E**. Proposed earthworks include grading for the provision of residential allotments. As illustrated on the Civil Plans all lots will be graded so as to shed stormwater towards the roadways of The Irons Drive and Ambrose Drive. Most of the future residential lots will require regrading to shed stormwater to roadways and the temporary detention basin.

The Subdivision and Civil Plans (**Appendix E**) provide a preliminary estimate of the earthworks volumes for the area of proposed subdivision

2.5.3 Removal of Existing Vegetation

A total of four trees are identified to be removed, along with other low level vegetation being grass and shrubs – as shown on the Civil Plans (**Appendix E**).

2.5.4 Civil Works

The proposal seeks approval for the connection to utility services (such as potable and recycled water reticulation, sewage, power, gas and telecoms) are to be provided by extension and augmentation of existing services already provided in Bingara Gorge, and within the reserve of The Irons Drive and Ambrose Drive.

3.0 Updated Environmental Assessment

This section of the report provides an updated assessment of the environmental impact associated with the proposed development and also in relation to the additional / updated information that has been prepared to respond to key issues raised by WSC.

As identified previously, the development contemplated by this DA sits wholly within the extent of the master plan consent ID993-05 site, and is accordingly informed by the detailed specialist technical reports and assessments that accompanied the underlying staged DA.

The amended development is also informed by the detailed specialist technical reports and assessments that accompanied the April 2015 SEE.

Only the relevant assessment items that are new or require further consideration have been included in this section.

With the exception of the reports and information listed below, the accompanying specialist technical reports and assessments prepared as part of the April 2015 SEE remain relevant to the proposed development:

- Updated Plans prepared by Lendlease (**Appendix B**);
- Updated Vegetation Removal Plan prepared by Ecological (**Appendix C**);
- Fire Trail Alignment Plan prepared by Ecological dated November 2015 (**Appendix D**);
- Subdivision and Civil Plans prepared by Cardno dated November 2015 (including Tree Removal Plan and Driveway Location Plan) (**Appendix E**);
- Updated Ecological Assessment Report prepared by Ecological dated November 2015 (**Appendix G**);
- Updated Transport Assessment prepared by Cardno dated November 2015 (**Appendix H**);
- Updated Flooding, Stormwater and Water Quality Management Strategy prepared by J Wyndham Prince dated November 2015 (**Appendix I**);
- Cultural Heritage Assessment Report Proposed Construction of Fire Trails prepared by Kayandel dated November 2015 (**Appendix J**).

Relevant matters that require further specific detailed assessment in relation to the proposed development are further detailed below. It is noted that a contamination assessment relating to the area of land that is the subject of the 15 lot residential subdivision is to be submitted under separate cover.

All other matters have been considered as part of the environmental assessment in the SEE dated April 2015 and this updated environmental assessment must be read in conjunction with the April 2015 SEE.

3.1 Compliance with Statutory Plans

In addition to the assessment provided at Section 5.1 and 5.2 of the April 2015 SEE, WSC has requested a detailed assessment of compliance of the proposed development in relation to the provisions of Sydney Regional Environmental Plan No. 20 – Hawkesbury Nepean River (SREP 20) be provided.

Further, the assessment of compliance of the proposed development in relation to the provisions of Wollondilly LEP 2011 and Wollondilly DCP 2011 as provided in the April 2015 SEE has been updated to reflect the amended development

proposal and also the additional / updated information that has been prepared and is provided with this Addendum SEE.

The detailed assessment of compliance in relation to the provisions of SREP 20, LEP 2011 and DCP 2011 is included at **Appendix F**. As demonstrated at **Appendix F**, the proposed development complies with the relevant provisions of SREP 20 and LEP 2011.

As also demonstrated at **Appendix F**, the proposed development also complies with the relevant provisions of DCP 2011 with the exception of the maximum permitted lot yield of 1,165 dwellings and the minimum lot sizes identified on the Concept Plan included in Volume 7 of the DCP. Minimum lot size and density is addressed in detail at **Section 3.2** below.

It is noted that Council has proceeded with revisions to DCP 2011 that were publicly exhibited earlier in 2015. A draft DCP is not a relevant matter for consideration under s79C of the EP&A Act and the exhibited amendments have not therefore been further considered in this Addendum SEE.

It is noted that the current DCP 2011 – Volume 7 Concept Plan, and the draft exhibited DCP 2011 are inconsistent with the minimum lot size provisions established by the Wollondilly LEP 2011 in relation to the Bingara Gorge site.

3.2 Density and Minimum Lot Size

The existing 973 residential lots that have been approved / lodged at Bingara Gorge to date relate to land within The Fairways East (precinct 3), Highlands (precinct 4), Greenbridge (precinct 5), Pembroke (precinct 6) and Greenbridge East (precinct 9) areas. The net developable residential area of the 5 precincts that have been substantially completed (i.e the area of residential lots excluding roads and open space etc) is approximately 841,388 m^2 or 84.1 ha.

The residential development already approved / proposed within these 5 substantially complete residential precincts has the following characteristics (noting that the final lot numbers within The Fairways East and Greenbridge East precincts are subject to approval):

Table 1 – Key figures of approved/proposed precincts

Precinct	No. of Lots	Min – Maximum Lot Size	Total Net Developable 'Lot' Area	Average Lot Size
3 The Fairways East	242*	255 – 2,752m^2	186,120 m^2	769 m^2
4 Highlands	175	444 – 1,661m^2	134,756 m^2	770 m^2
5 Greenbridge	189	250 – 1112 m^2	92,941 m^2	491 m^2
6 Pembroke	170	448 – 4,598 m^2	245,281 m^2	1442 m^2
9 Greenbridge East	212**	453 – 7,225 m^2	182,290 m^2	860 m^2
Total	988*	250 – 7,225 m^2	841,388 m^2	850 m^2

* Note that the total 988 lots shown in this table includes the 15 additional lots proposed within Fairways East as part of this DA

** The 212 lots in Greenbridge East includes 77 lots (Stage 4c-d) lodged with Council on 1/4/2015 and as yet undetermined

The average lot size of the residential development that has been progressed by Lendlease (and approved by WSC) to date under the master plan consent ID993-05 within the above precincts is 850m^2.

The net developable residential area of precincts 1 (Rural), 2 (The Fairways), 7 (Bushland) and 8 (Golf Town) is approximately 69.9 ha. It is noted that the 69.9 ha figure assumes the retention of the additional 5 ha of vegetation within precinct 7 as recommended by Eco Logical and shown on the updated Vegetation Removal Plan.

This staged DA proposes a maximum of 812 lots to be located within the estimated 69.9 ha net residential developable area of precincts 1, 2, 7 and 8. Development of 812 lots within this estimated net developable area would result in an average lots size of approximately 860 m^2.

Alternatively, if the total Bingara Gorge estimated net developable residential area of approximately 154 ha (comprising the approximately 84.1 ha net developable area of precincts 3, 4, 5, 6 and 9 that are substantially completed together with the approximately 69.9 ha of net developable area of precincts 1, 2, 7 and 8 that is yet to be developed) is developed for the total maximum 1,800 residential lots as proposed in this DA, the average lot size across the whole of the site would be approximately 855 m^2.

Whether looking at the Bingara Gorge site as a whole, or at the development proposed within the area of precincts 1, 2, 7 and 8 in isolation, this DA will result in an average size of lots (i.e approximately 855 - 860 m^2) that is entirely consistent with the size of lots that have been assessed and determined to be satisfactory in terms of residential amenity and all other environmental impacts by WSC to date.

The proposed development and estimated resultant average lot size complies with the minimum 250m^2 lot size permitted under LEP 2011.

The average lot size proposed is almost double the current average greenfield lot size sold in SW Sydney of c.450m^2, and more than double the current average greenfield lot size sold across metropolitan Sydney of c.410 m^2 (estimate provided by Lendlease).

As set out at **Section 2.1** above, the 1,165 lot yield under the current master plan consent ID993-05 allows for only a further 192 residential lots to be developed within the remaining estimated net residential developable area of 69.9 ha within precincts 1, 2, 7 and 8.

Developing the remainder of the Bingara Gorge site within the cap of 1,165 lots applying under the existing master plan consent ID993-05 would result in average lot sizes of approximately 3,900 m^2, significantly in excess of the average lot size that has otherwise been determined to be satisfactory by WSC and has already been developed and sold across the initial stages of the development.

LEP 2011 permits residential development on the land to which this DA relates at a much greater density than that which is proposed in this DA. For example, if the remaining approximately 69.9 ha of net developable residential area within precincts 1, 2, 7 and 8 were developed at the minimum lot size permitted under LEP 2011 (i.e 250 m^2), 2,796 lots could theoretically be achieved resulting in almost more than 3,700 lots across the site as a whole. Lendlease is only seeking a maximum of 1,800 residential lots on the site.

The Draft Wilton Junction Masterplan contemplates 1,600 – 2,000 dwellings at Bingara Gorge. Further, the Greater Macarthur Land Release documentations that have recently been publicly exhibited by the NSW Department of Environment and Planning assume residential development at a density of 15 dwellings per hectare across the majority of the site, which would equate to average lot sizes of approximately 450m^2.

The maximum 812 residential lots proposed on approximately 69.9 ha of net developable area in this DA is permissible under LEP 2011 and is consistent with the density of development and average lot sizes that have been approved to date by WSC across the 5 residential precincts that have been substantially completed.

3.3 Ecology

An Ecological Impact Assessment was submitted with the April 2015 SEE. WSC has raised a number of questions regarding the original ecology assessment, and has flagged that a Species Impact Statement (SIS) may need to be prepared and submitted with the application.

An Updated Ecological Impact Assessment – Addendum 1 has been prepared by Ecological and is included at **Appendix G**. The updated Ecological Assessment seeks to address each of the concerns previously raised by WSC in relation to additional survey and mapping, and the proposed location of fire trails.

Substantial additional fieldwork, including over 300 hours of additional survey work and records of threatened species has been undertaken by Eco Logical since the 30 hour survey undertaken in 2013.

This additional fieldwork has significantly increased the knowledge of the ecology of the site. This data has been used to re-examine the proposed development and conservation footprints on the site, resulting in a 5 hectare reduction in development within precinct 7 and a 16 hectare increase in the total amount of land being managed for conservation purposes.

Significant changes have been made to the mapped vegetation communities based on the results of the further ecological work. Much of the vegetation previously mapped as Shale Sandstone Transition Forest (SSTF) on the site was found to be located on soils with no shale influence and more closely correlated with Burragorang Nepean Hinterland Woodland (BNHW).

An area of low condition Cumberland Plain Woodland (CPW) was identified adjacent the Hume Highway on the western part of the site, and has been identified as being of low long term management viability.

Several species of threatened flora have been located on the site, and the development footprint has been reduced to ensure retention of viable populations of all threatened flora species on the site. For those individuals that are proposed to be retained a minimum buffer of 20 metres has been provided around each location.

Despite extensive targeted surveys as part of the additional fieldwork, no additional threatened fauna species were recorded on the site.

In summary, the updated Ecological Assessment – Addendum 1 demonstrates that the proposed development will result in:

- Conservation of a total of 127 hectares of native vegetation including the 112 hectares of EP&R Lands, plus an additional 16 hectares of Additional Conservation Lands. Included in the 127 hectares of vegetation to be retained is an additional 5 ha of vegetation within development precinct 7 which is now no longer proposed to be cleared as part of this DA (refer to **Figure 11** below);
- The loss of a total of 35.54 ha of native vegetation included 34.34 ha within the development areas of precincts 1, 2, 7 and 8 and up to 1.2 ha within the EP&R Lands for fire trails;
- The protection and management of 96% of the 3591 individual threatened plants that have been recorded on the site. Only 4% (138) of individual

threatened plants that have been identified will be cleared as part of the development

Further detail in relation to the key findings and recommendations of the Ecological Assessment are provided below.

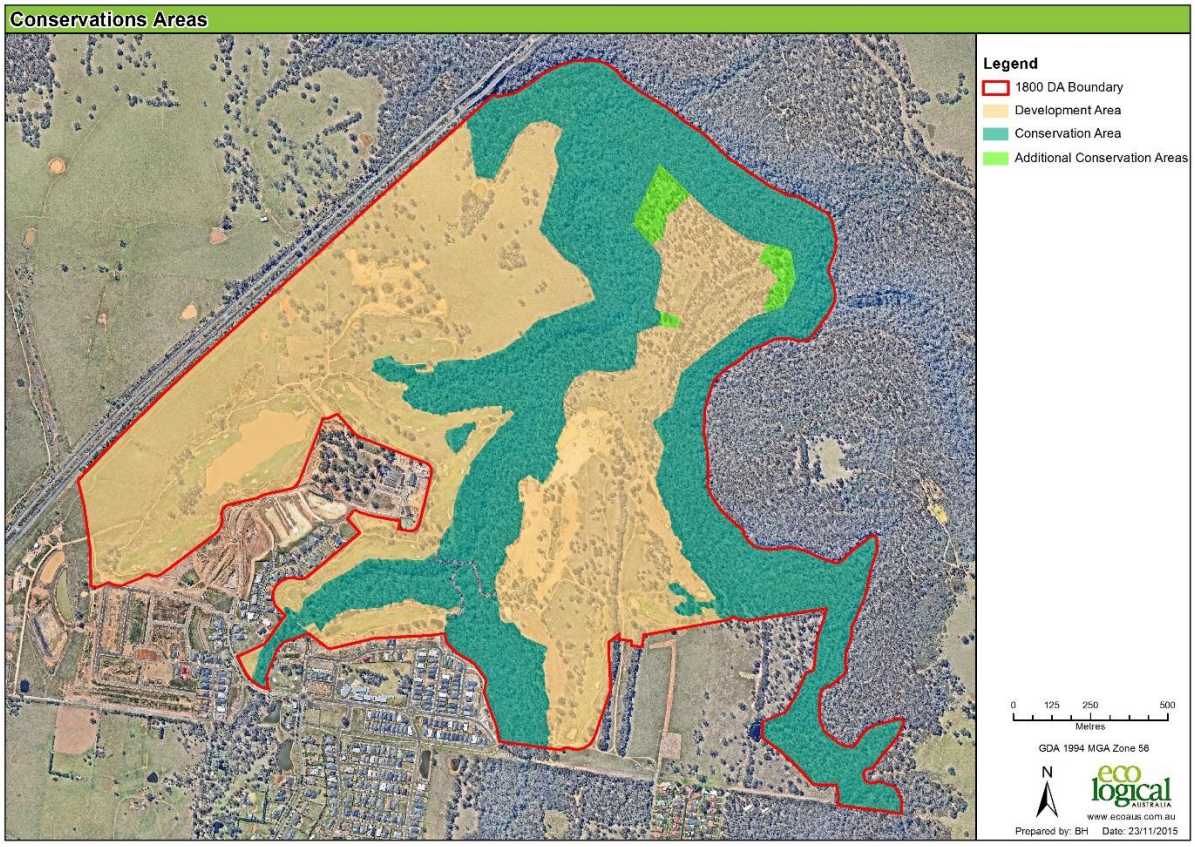

Figure 11 – Location of 5ha of additional vegetation to be retained within development precinct 7
Source: Eco Logical

Impact to Vegetation Communities and Fauna Species

As a result of the amended proposal, a total of 35.54 ha of vegetation will be impacted, with 126.99 ha to be retained. The 35.5 ha of vegetation proposed to be cleared is shown on the Vegetation Removal Plan prepared by Ecological included at **Appendix C**. It consists of:

- 21.3 hectares of BNHW;
- 8.3 ha of SSTF (5.7 hectares of moderate condition and 2.6 hectares of low condition/DNG); and
- 5.9 hectares of CPW (0.9 hectare of moderate condition and 4.9 hectares of low condition/DNG).

As described in Section 2 of this Addendum SEE, the proposal includes the clearing for and construction of fire trails within the site. The clearing associated with this component of the development includes the removal of 1.2 ha of vegetation. The up to 1.2 ha to be cleared for fire trails is included in the 35.54 ha figure.

The proposed alignment of the fire trails has been carefully designed to avoid areas of high biodiversity value (in conjunction with cultural heritage considerations). The impact assessment has assumed that the proposal will involve the creation of full 4m wide pathway being cleared.

The proposal will result in the loss of only 4% of recorded threatened plants at the site with the remaining 96% to be protected and managed within the EP&R lands or additional conservation lands. Refer to Table 2 included in the updated Ecological Assessment – Addendum 1.

With regards to threatened fauna, the loss of foraging habitat for birds and bats equates to approximately 35.6 ha of moderate to good vegetation on the site. This loss needs to be considered in the context of the proposed habitat retention on such a large site. Eco Logical conclude that overall, in excess of 127 hectares of high quality habitat will be retained within the Environmental Protection and Recreation Lands, or in the additional conservation lands that will incorporate a protection and management structure of a similar or better legal standing.

All of the loss and retention calculations provided by Eco Logical are based on the maximum likely extent of 1.2 ha of clearing for fire trails. Eco Logical identifies that there is the potential for the amount of fire trails within the conservation areas to be reduced during the detailed design of the neighbouring urban development.

To compensate for the loss of CPW, a minimum of 70 credits of CPW will be purchased and retired.

To mitigate against indirect impacts, a comprehensive Environmental Management Plan (EMP) will be prepared and implemented to ensure the long term viability of the species and ecological communities present with the EP&R lands. It is anticipated that the existing EMP will be required to be updated to comply with any conditions of consent for this DA

As part of the additional fieldwork, no additional threatened fauna species have been recorded on the site.

Species Impact Statement

As part of the updated Ecological Assessment (**Appendix G**) and additional field investigations and surveys, Eco Logical has identified two critically endangered ecological communities, five threatened flora, 25 threatened fauna species and two migratory species listed under the *Threatened Species Conservation* (TSC) and and/ or the *Environmental Protection Biodiversity Conservation Act* (EPBC) as being impacted by the proposal.

Assessments of Significance ('Seven Part Tests') were undertaken in accordance with section 5A of the EP&A Act by Eco Logical with the additional data obtained. These concluded that the impact to the ecological communities and species identified is not likely to be a significant impact and an SIS is not required.

The updated Ecological Assessment – Addendum 1 includes updated 7 part tests of significance (refer to Appendix A of the Ecological Assessment). The updated 7 part tests of significance conclude that the impact to identified species and ecological communities is not likely to be significant and that a SIS is not therefore required. The main reasons for the conclusion of Eco Logical that the impact is unlikely to be significant are as follows:

- The area of vegetation/habitat being lost is of poorer quality and has a long history of agricultural use;
- A large area of high quality vegetation / habitat is being retained and managed within the 127 hectare* environmental protection and conservation lands. These lands have been targeted towards the areas of highest biodiversity value on the site;

- The proposal will not fragment the habitat in the area or reduce connectivity in a manner that will affect the long term viability of the critically endangered ecological community or threatened species known or likely to occur on the site;
- 96% of the threatened plants found on the site will be retained within the 127 hectare conservation lands;
- The potential for indirect impacts can be mitigated through the preparation and implementation of the Environmental Management Plan.

* The 127 hectares includes the proposed fire trail alignment.

The retention and management of a large, high-quality 127 hectare area of vegetation/habitat within the EP&R and additional conservation lands, including the additional 5 ha of vegetation located within precinct 7 (which is no longer proposed to be cleared), ensures the long term viability of the species and vegetation communities known or with the potential to occur in the local area.

Visual Impact of tree removal

The clearing of vegetation on the site primarily relates to that vegetation which is located within the developable footprint approved as part of the existing master plan consent that has always been intended to be delivered as residential dwellings. The amended proposal does, however, seek to conserve 5 ha more of this land than is currently provided for under the existing master plan consent.

The key scenic and environmental qualities of the landscape are conserved and protected within the ESL and EP&R. Where vegetation is removed in these locations, this is in order to provide for required low impact fire trails in accordance with WSC's DCP 2011.

Additionally, as part of the revised report and additional survey work and data collection undertaken by Ecological, the development footprint has been reduced by 5 hectare and an 16 hectare increase is proposed in the amount of land being managed for conservation purposes, both of which will further contribute to scenic and environmental qualities of the landscape of the site.

Recommendations

In addition to the recommendations contained in the original Ecological Assessment, Eco Logical has made the following additional recommendations:

- Pre-clearing surveys to be undertaken along the fire trail alignment to minimise impacts
- Translocation of threatened flora located within the development area to the conservation area. This is an additional measure beyond the avoidance and protection considered in the 7 part tests.

3.4 Transport and Accessibility

A Transport Assessment prepared by Cardno accompanied the April 2015 SEE.

WSC has raised a number of questions in relation to the traffic generation rates, assignment of traffic, traffic modelling uses and assumptions, performance of intersections (external and internal) and future roadworks.

Cardno has worked with WSC to agree on the traffic modelling and assumptions to be used for the project and has undertaken further modelling and assessment work based on the parameters agreed as part of this exercise.

An updated Transport Assessment has been prepared by Cardno and is included at **Appendix H**. The updated report has considered the traffic impact issues associated with the increased development yield and proposed distribution of development.

A summary of the key methodology, findings and recommendations contained within the updated Transport Assessment follows.

3.4.1 Scope and Assumptions

In terms of scope, WSC and Cardno agreed that the revised Transport Assessment would:

- assess and compare the subject residential yield increase (1,165 dwellings to the proposed 1,800 dwellings);
- utilise a combined SATURN and SIDRA assessment methodology given the AIMSUN traffic modelling was not available;
- assess the morning and evening peak hour periods, and the daily traffic demand scenario, including:
  - Internal road link demands and possible traffic amenity issues;
  - External Picton Road intersection operations and upgrade requirements; and
- not consider any possible future development identified as part of the broader Wilton Junction plan as this has already been assessed as part of the Wilton Junction TMAP.

The revised Transport Assessment prepared by Cardno focusses on the following key issues:

- External traffic operations at Picton Road intersections;
- Internal intersection operations; and
- Internal two-way traffic demands on individual road sections within the Bingara Gorge development.

The Transport Assessment has been revised to include the gap and headway gap parameters as agreed with WSC to analyse the external intersection traffic performance. The assessment of these intersections with Picton Road (Pembroke Parade and Almond Street) confirms that for both the 1165 and 1800 lot, the intersections 'fail' sooner than previously predicted, but importantly the identified and recommended signalised intersection formation in these locations does not change.

The updated Transport Assessment also includes consideration of traffic demand from future road works associated with the upgrade of the Hume Highway/Picton Road interchange. Given the commitment of RMS to install signals at this intersection, traffic operations are expected to improve when compared to existing.

The assessment report also confirms that the Wollondilly Street Connection will be required to be delivered prior to any dwellings in excess of 1,165 being approved.

The following methodology has been applied in preparing the revised Transport Assessment (**Appendix H**):

- Quantify the development traffic generation;
- Determine the external development trip distribution;

- Evaluate the projected background traffic growth on the adjacent road network (i.e. Picton Road);
- Develop a network traffic model and assign development traffic to the local road network for the following scenarios:
  - 2013 'No Development' AM, PM, and Daily traffic scenario;
  - 2036 'With Development' AM, PM, and Daily traffic scenario.

3.4.2 Traffic Generation and Assignment

Residential Traffic Generation

Cardno has undertaken traffic surveys in September 2015 to confirm the likely Bingara Gorge residential traffic generation rate. The survey included an area of 167 residential dwellings in a Wilton residential catchment

The generation assumptions have been revised in response to these surveys. The following trip generation rates for the residential component are adopted

- 0.8 vph per dwelling in the AM and PM peak hours
- 8.1 vpd per dwelling throughout the day
- 75%/25% in/out (out/in) peak hour directional split.

The rates adopted as part of the Transport Assessment are considered reasonable and appropriate given they have been determined from actual data and are higher than the rates summarised in the most recent RMS TDT2013/04a advice surveying five regional RMS sites.

School, Retail and Leisure Traffic Generation

Consideration of school, retail, and leisure /golf course generation have also been included as part of the traffic modelling given revised assumptions. The following generation rates have been adopted:

- **School Traffic Generation** - 430 trips (entering and exiting) during the AM peak hour – higher than the previously assessed 359 trips based on surveys of other primary schools.
- **Retail Traffic Generation**
  - 68 vehicles – AM peak hour
  - 154 vehicles – PM peak hour
  - 1515 vehicles – Daily period.
- **Leisure/Golf Course Generation**
  - 60 vehicle trips – AM and PM peak hour generation based on surveys of other locations
  - 600 vehicle trips – Daily generation
  - 50% - proportion of peak hour trips that have an internal residential origin or destination.
  - 2% - proportion of AM, PM, and daily residential trips are attributed to other recreational trips to/from internal recreational destinations.

Traffic Assignment

External traffic assignment assumptions have been adopted in the attached report (from those included in original report) to align with requested sensitivity scenarios provided by Council.

3.4.3 Intersection Performance

External Intersection Performance

The following external intersections have been reviewed as part of the revised Traffic Assessment Report (**Appendix H**):

- Picton Road / Pembroke Parade; and
- Picton Road / Almond Street.

Picton Road/Pembroke Parade Intersection
The results of the SIDRA analysis confirm that the existing unsignalised arrangement (seagull) will require upgrading at the 2036 time horizon regardless of the Bingara Gorge residential yield. The assessment assumes that this intersection will be upgraded to be signalised.

Should the intersection be upgraded to signals, the results indicate that the intersection will operate within typically accepted performance thresholds irrespective of the Bingara Gorge residential yield (1,165 or 1,800).

Picton Road/Almond Street Intersection
The results of the SIDRA analysis confirm that the existing unsignalised arrangement will require upgrading before the 2036 time horizon regardless of the Bingara Gorge residential yield. A monetary contribution towards the upgrade (as part of the 1,165 lots) is subject to a separate component of the Voluntary Planning Agreement (VPA). The proposed arrangement will be an upgraded seagull arrangement, with recommendation to be signalised.

The results indicate that the intersection will operate beyond typically accepted performance thresholds during the morning peak hours irrespective of the Bingara Gorge residential yield (1,165 or 1,800).

The assessment of both these intersections with Picton Road (Pembroke Parade and Almond Street) confirms that for both the 1165 and 1800 lot, the intersections 'fail' slightly sooner, but importantly does not change the identified and recommended upgraded intersection arrangement (signalisation and seagull) in these locations.

Internal Intersection Performance

Internal traffic demand, including link and intersection capabilities have been carried out in the revised report. These have been prepared for both the 1,165 and 1,800 lot scenarios. The following intersections have been considered as being key:

- Pembroke Parade / Oxenbridge – roundabout intersection
- Pembroke Parade / Fairway Drive / Greenbridge – roundabout intersection.

The assessment confirms that all internal intersections have sufficient capacity (2036) to cater for a maximum 1,800 dwellings traffic demands.

3.4.4 Internal Traffic Demand and Amenity

The revised Traffic Assessment Report (**Appendix H**) has considered the traffic thresholds on different hierarchies of roads, to assess the amenity of the traffic environment

A SATURN modelling process has been used by Cardno, as agreed with Council, for the assignment of internal traffic, with the following scenarios assessed.

- 1,165 dwelling scenario

  - AM peak hour traffic demand
  - PM peak hour traffic demand
  - Daily traffic demand
- 1,800 dwelling scenario
  - AM peak hour traffic demand
  - PM peak hour traffic demand
  - Daily traffic demand.

The output of this analysis indicates key development connections including Pembroke Parade, Oxenbridge Avenue, Greenbridge Drive, and Fairway Drive will cater for traffic demands that are at the upper range of the broader planning thresholds typically published by a selection of Australian planning and approvals authorities.

Notwithstanding, the demands can be considered reasonable based on consideration of:

- the traffic assumptions adopted as part of the SATURN modelling exercise are conservative, especially at the 2036 time horizon where the car mode share is projected to be lower given improved public transport and nearby external employment and retail development;
- each of the critical road sections include separate provision for kerbside or indented car parking, thereby ensuring the full-time provision for two general traffic lanes;
- the density of direct residential frontage access on the critical road sections is relatively low and could be considered comparable to that achieved by medium density residential development with consolidated access;
- road reserves are relatively wide and include pathway provisions for pedestrians and cyclists;
- the demands modelled by Cardno in SATURN are mostly similar and in some locations lower than those estimated as part of the *Wilton Junction Development – Transport Management and Accessibility Plan* (PB, June 2014); and
- Given the already constructed residential dwellings are setback between 12-25m, acoustic and amenity impacts will be reduced.

3.4.5 Public Transport

The development footprint and proposed internal road layout is not proposed to be altered between the currently approved 1,165 lots and 1,800 lots arrangement. As stated in the original Transport Assessment Report, the majority of residential will be within 800m of a bus stop, with design of lots to encourage dwellings within 400m of a bus stop.

3.5 Water Cycle Management

The ability for the proposed development to meet appropriate water quality target values, stormwater management objective, and flooding criteria has been questioned by WSC.

A Flooding Stormwater and Water Quality Management Report prepared by J Wyndham Prince was provided with the April 2015 SEE. To respond to the specific issues raised by Council, an updated Flooding, Stormwater and Water Quality Management Report dated November 2015 has been prepared by J Wyndham Prince (**Appendix I**).

The updated report builds upon the previously approved stormwater strategies for the site (JWP, 2002 and JWP, 2005) and provides updated water quantity and quality modelling to reflect the latest development proposal, the increased development densities and latest enhancements within the modelling software together with delivering a reduced Water quality target as requested by WSC.

The report has been prepared in conformity with the statutory requirements and industry best practice for stormwater management within the catchment. The preparation of the report has involved:

- Amending the existing hydrologic model for the site to reflect the latest development layout and to modify the percentage of catchment imperviousness to reflect the proposed increase in development density;
- Determining the revised peak post development flows for the 2 and 100 year ARI events at various locations within the development and downstream and comparing to existing case peak flows;
- Undertaking hydraulic calculations at key locations within the site to confirm the lots are above the flood levels;
- Updating the MUSIC water quality modelling to reflect the updated lot layout and increased development densities and confirming whether the current proposed water quality and reuse scheme is adequate to meet the applicable targets;
- Estimating the expected life cycle costs for the water quality / quantity management system proposed for the site;
- Preparation of a Stormwater Management Plan showing the details of the reuse, stormwater quality and quantity devices that form part of the strategy;
- Preparation of a Flooding, Stormwater and Water Quality Management Strategy Report that outlines the methodology, assumptions and results of the investigation suitable to provide support for the staged DA.

Existing and post development case hydrology models have been prepared for the Bingara Gorge site, which incorporate all upstream catchments draining to and adjacent to the site, and also including catchments downstream. The hydrological modelling indicates that there are some increases in peak flows locally within the site, which can be accommodated within the drainage corridors. However, the modelling demonstrates that peak post development flows without detention basins are decreased downstream of the site (within Allens Creek).

Provision of the proposed water quality treatment devices and reuse within the development will ensure that the post development stormwater discharges will meet the agreed pollutant concentration targets for stormwater discharging from the site.

The key findings and recommendations of the updated Flooding, Stormwater and Water Quality Management Report are summarised below.

3.5.1 Water Quantity

Flooding

The hydraulic assessment within the Flooding, Stormwater and Water Quality Management Strategy (**Appendix I**) indicates that generally the proposed lots at Bingara Gorge are well above the 100 year ARI flood levels but that in some isolated cases, there may be a need for local filling on lots to ensure the freeboard requirements are met to finished floor levels.

The area of the Bingara Gorge site that is within the 100 year ARI flood level is shown on Figure 9.1 of the Stormwater Report. As is demonstrated, none of land that is within the 100 year ARI flood level is included within development precincts 1, 2, 7 or 8, which are the subject of this DA. The area of residential land that is within the 100 year ARI flood levels is already the subject of a development consent issued by WSC.

Storm Flows

As requested by WSC, a revised storm flow study has been undertaken using the rainfall - runoff flood routing model XP-RAFTS. All parameters and assumptions to the model including the discharge estimates are detailed in the Stormwater Report (**Appendix I**).

In summary, the result of the storm flow analysis modelling confirms that the development of the site to a maximum of 1,800 lots will increase the peak 2 and 100 year Average Recurrence Intervals (ARI) flows for some local sub-catchments within the site but will result in an overall 1% reduction of peak flows on Allens Creek downstream of the site. Flow rates on Allens Creek are decreased for storm flows (2 and 100 ARI) after the development due to the proposed stormwater re-use scheme and variations in relative catchment sizes and flood response.

3.5.2 Water Quality

To maintain stormwater quality to the required levels, a "treatment train" approach has been adopted where various types of pollutants are removed by a number of devices acting in series, including: gross pollutant traps, ponds, underground tanks and the stormwater reuse scheme.

As part of the revised Stormwater Report (**Appendix I**), a revised MUSIC (Model for Urban Stormwater Improvement Conceptualisation) model (Ewater, 2009) was used to undertake a revised water quality analysis. The MUSIC model was revised to include more recent advancements and available parameter data, in consultation with WSC.

The revised MUSIC model has been modified with the following specific updates:

- The percentage of impervious within the proposed development areas was increased from 40% to 60% to reflect the increase in development densities;
- Pond areas and volumes available for stormwater capture and reuse were updated to reflect the latest design values;
- The reuse rates available for irrigation were updated to the latest design values;
- Secondary node links were added to the model (a new feature in MUSIC Version 5) which allows captured stormwater to be transferred to the main lake for irrigation purposes, as occurs in practice;
- Annual pollutant loading rates and rainfall-runoof parametrs were updated to the published values in the NSW Draft MUSIC Modelling Guidelines (SMCMA, 2010); and
- A bio retention system has been included immediately downstream of the main western lake to achieve the required Water quality concentration targets outlined in the Healthy Rivers Commission document (HRC, 1998).

The bio retention system included in the model is a small (350sqm) bioretention raingarden at the discharge point of the main ornamental lake prior to entering the western gully.

MUSIC Model Results

The revised MUSIC modelling demonstrates that the combination of gross pollutant traps, ponds, underground tanks and the stormwater reuse scheme will result in discharge concentration levels compliant with the Healthy River Commission. The results of the pollutant concentration assessment also demonstrate that the agreed concentration limits of 0.035mg/L (TP) and 0.70mg/L (TN) are satisfied both within the site and at the downstream boundary at Allens Creek.

Healthy Rivers Commission (HRC, 1998) Independent Inquiry into the Hawkesbury Nepean River System (dated August, 1998) details the required (mean) concentration pollution reduction targets that are applicable to development. Bingara Gorge is located within the "Mixed use rural areas and sandstone plateau" classification.

The results of the pollutant concentration assessment also demonstrate that the agreed concentration limits of 0.035mg/L (TP) and 0.70mg/L (TN) are satisfied both within the site and at the downstream boundary at Allens Creek.

Stormwater Reuse

Stormwater reuse on the site will be on the golf course only, and forms part of a separate approval. Stormwater is captured from the urban areas for this purpose. However, there is no reticulation of stormwater back to the urban areas for reuse due to the irrigation demand for the golf course requiring all captured stormwater.

3.6 Indigenous Heritage

A Cultural Heritage Report prepared by Kayandel Archaelogical Services was submitted with the April 2015 SEE. That Report addressed the impact of the proposed development within precincts 1, 2, 7 and 8 however did not specifically address the impact of the proposed fired trails.

WSC has questioned the level of detail included in the Aboriginal Cultural Heritage Report submitted with the April 2015 SEE in relation to the removal of vegetation within precincts 1, 2, 7 and 9, and has also requested an assessment of the proposed fire trails/pedestrian and cycle trails.

The Cultural Heritage Report submitted with the April 2015 SEE in relation to the clearing of vegetation within the development precincts is considered to be satisfactory in relation to that component of the proposed development. Additional information requested by WSC is appropriately provided at the stage of seeking an AHIP for the works, which occurs post the issue of development consent. No further information is therefore required to be provided in relation to this aspect of the proposed development at this stage.

A separate Cultural Heritage Assessment Report has now been prepared by Kayandel Archaeological Services in relation to the proposed construction of the fire trails within the environmentally significant lands. Refer to report included at **Appendix J**. The Cultural Heritage Assessment relating to the proposed construction of fire trails is submitted in draft format until such time as a 28 day consultation period with Aboriginal Community Groups has been completed, in accordance with Office of Environment and Heritage requirements.

Kayandel has undertaken an archaeological survey of the alignment of the proposed fire trails as shown on **Figure 7**. The survey area consists of 5 discrete portions located in the northern and eastern portions of the Bingara Gorge development area.

In undertaking the archaeological survey the alignment of the fire trails was 'buffered' by 50 meters in order to establish the areas to be considered for assessment. The size of the area subject to archaeological survey, once buffered, is approximately 42.6 ha. It is noted that portion 5 surveyed sits partly within and partly outside of the boundary of the land to which this DA relates, however the full buffer area has been included for completeness.

The archaeological survey results are set out at Section 7 of the Cultural Heritage Assessment.

Prior to the commencement of the survey it was known that 10 registered Aboriginal sites would likely be impacted as part of the works. These sites are:

- BG-PAD-01
- BG-PAD-02
- BG-PAD-03
- BG-PAD-04
- BG-PAD-06
- CT-PAD-01
- CT-PAD-02
- CT-PAD-03
- CT-AS-01

Additional to these already know sites the following Aboriginal sites were identified during the survey:

- 1 Possible Aboriginal scar tree
- 7 rock shelters suitable for habitation; and,
- 1 rock shelter with PAD

The identified sites are illustrated on Figure 21 of the Cultural Heritage Report, reproduced at **Figure 12** below.

Table 10 of the Cultural Heritage Assessment Report provides an assessment of the impacts to Aboriginal sites likely to arise in relation to the proposed fire trails and identifies that an AHIP will be required in respect of 7 of the identified Sites.

Kayandal conclude that the following Aboriginal sites could be negatively impacted by the proposed fire trail alignment:

- BG-PAD-01
- BG-PAD-02
- BG-PAD-03
- BG-PAD-04
- BG-PAD-06
- CT-PAD-01
- CT-PAD-02
- CT-PAD-03
- CT-AS-01

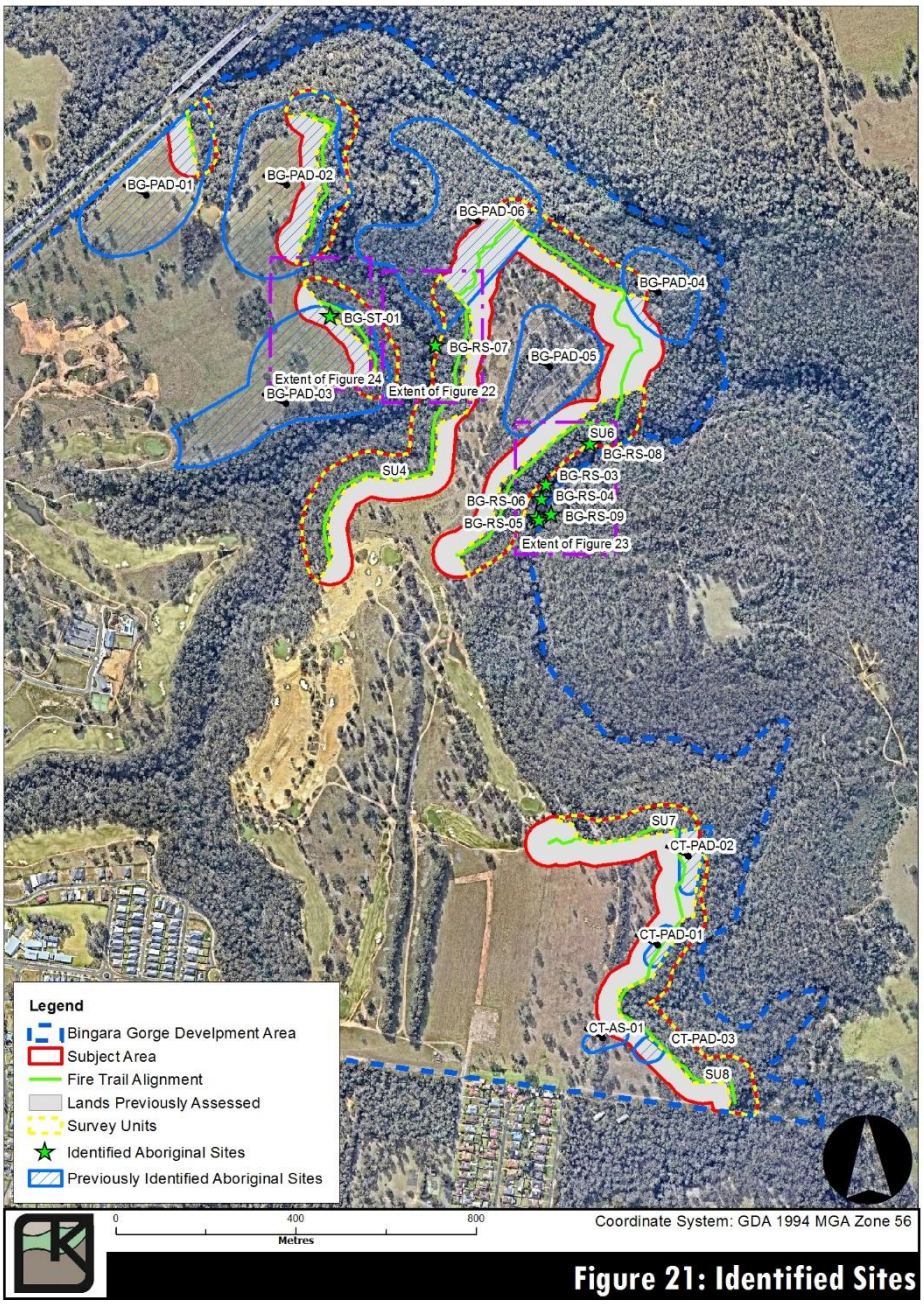

Figure 12 – Identified Aboriginal sites
Source: Kayandel

In summary Kayandel make the following key recommendations:

- No further assessment of the Aboriginal heritage within the subject area is required to inform the development application proposal however further investigation, in the form of subsurface test excavation in accordance with the Code of Practice (DECCW, 2010a) will be required for those portions of Aboriginal sites identified in Figure 26 of the Cultural Heritage Assessment Report. This should only be undertaken post the issue of development consent;
- As part of the management strategy it will be necessary to lodge an AHIP application under Part 6 of the National Parks and Wildlife Act 1974 with the Office of Environment and Heritage prior to the commencement of the

construction of those portions of the sites identified in Figure 26 of the Cultural Heritage Assessment Report;

- A process of consultation with Aboriginal stakeholders will be required to be undertaken in accordance with the specifications of Aboriginal Cultural Heritage Requirements for Proponents (DECCQ, 2010b); and
- A copy of the final report should be sent to the Registered Aboriginal Parties.

3.7 Mine Subsidence

Lendlease is aware that the Bingara Gorge Project is underlain by coal reserves and an approval to mine, and is within a mine subsidence area.

Under the EP&A Act, approval to alter or erect improvements within a mine subsidence district or to subdivide land therein is integrated development.

Each detailed subdivision DA or DA proposing construction of structures at Bingara Gorge is currently required to be referred to the MSB. This will be the case for the proposed 15 lot subdivision, and also for future detailed subdivision DAs in relation to the 812 lots proposed within precincts 1, 2 7 and 8.

The MSB has been receiving and approving ongoing referrals for subdivision and construction works at Bingara Gorge for many years, and has previously provided building specifications for future building approvals. These building specifications can continue to be applied readily to the ongoing development of the remaining stages of the project without detriment to the coal reserves and/or the approved mine.

The DA as submitted to WSC in April 2015 was referred to the MSB by the Council. The response of the MSB dated stating no objection to the proposed works included in the DA (at the time vegetation removal / fire trails were the only works proposed) is included at **Appendix K**.

3.8 15 Lot Subdivision Considerations

3.8.1 Bushfire

Part of the proposed lot to be subdivided into 15 lots is identified by WSC as bushfire prone land.

A Bushfire Protection Assessment (BPA) has been prepared by Eco Logical Australia in relation to this component of the proposed development (**Appendix L**).

The area of the lot to be subdivided is shown below on an extract of Council's bushfire prone land map (**Figure 13**).

The BPA provides various recommendations to ensure the proposed development complies with Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2008,* and 'Planning for Bushfire Protection 2006' (RFS, 2006).

Figure 14 identifies the area of proposed subdivision in relation to the nearest bush fire prone vegetation. This vegetation is located south and east and is well separated from the proposed lots by a golf fairway that is generally 100 metres in width. The threat assessment considers the nearby vegetation types and effective slope that may influence fire behaviours. The nearby vegetation is generally SSTF being on a downslope of between 10-15%.

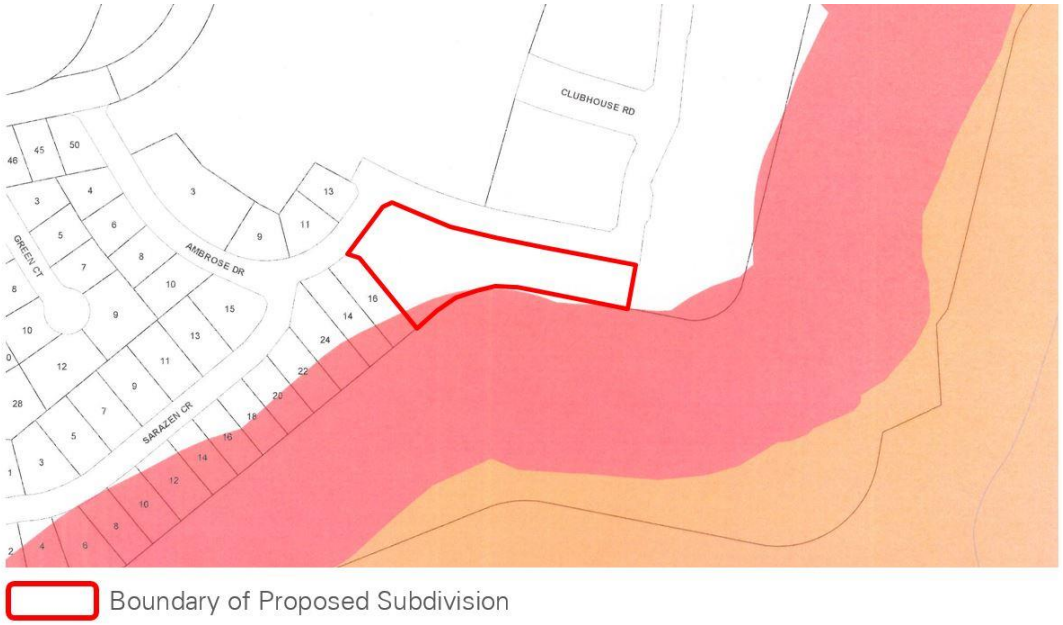

Figure 13 – Bushfire Prone Land Map applying to the area of proposed subdivision
Source: Wollondilly Shire Council

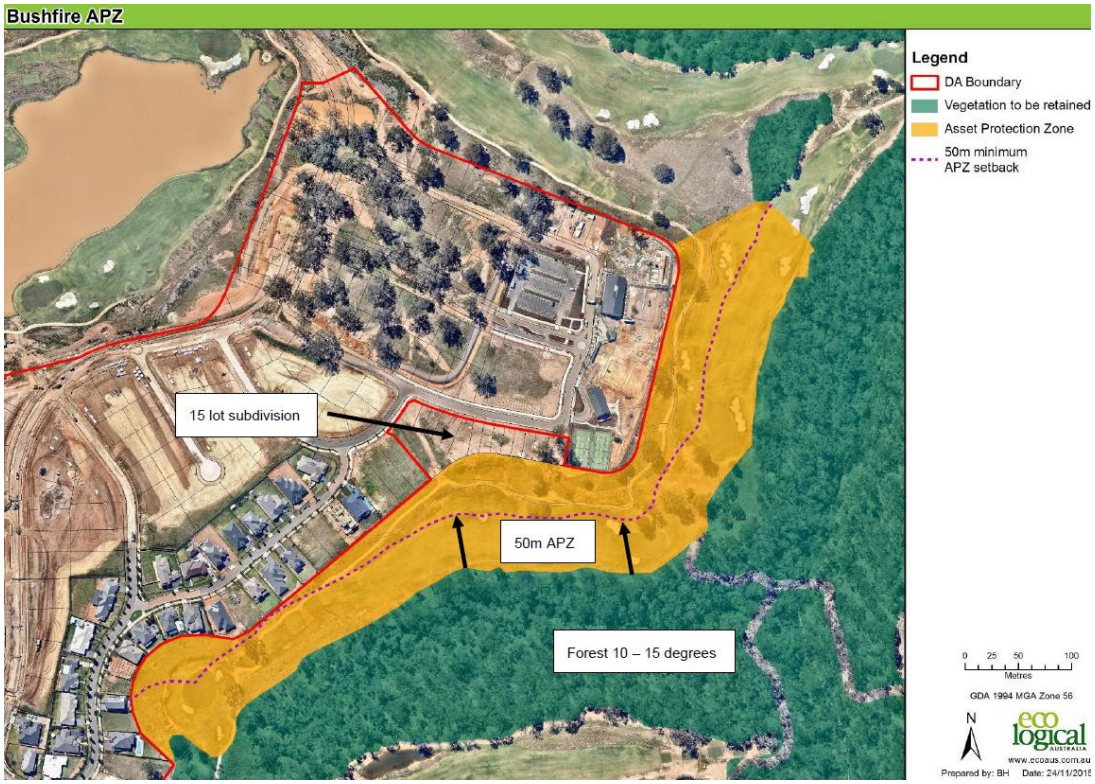

Figure 14 – Bushfire Asset Protection Zone
Source: Eco Logical

Planning for Bushfire Protection has been used to determine the required Asset Protection Zone (APZ) for the site, considerate of the specific context of the site and surrounds. The report (**Appendix L**) confirms that the required APZ is 50m, which is already provided by the fairway of the adjacent golf hole.

All services (water supply, gas and electoral) and access to and from the site are compliant and/or capable of complying with the Planning for Bushfire Protection guidelines.

3.8.2 Acoustic Impact of Country Club

The proposed subdivision is located to the south west of the approved Bingara Country Club. The Country Club site is occupied by a number of buildings, and recreation facilities, including swimming pools and tennis courts. Adjacent to the area of proposed subdivision are two tennis courts, and golf buggy store further north.

WSC has requested that consideration be given to any potential acoustic impacts associated with the Club operation in relation to the proposed 15 lot subdivision.

The acoustic report that accompanied the Country Club DA confirms that the operation of the Country Club, including the Function Room/Bar /Café (located approximately 50m at the closest), as per the recommendations will not exceed the project specific acoustic criteria at the closest residential receiver, being proximate to the location of proposed Lot 15 as shown on the Subdivision and Civil Plans (**Appendix D**). The recommendations of the acoustic report are prescribed by Condition 2 of Development Consent 010.2011.648.1 (Country Club DA).

Proposed lots further south east of the Country Club, will only benefit from a reduction in noise levels, and will also comply with the project specific noise criteria as established within the Country Club Acoustic Report.

3.8.3 Golf Course Safety Assessment

The proposed 15 lot subdivision is located on residential land that is adjacent hole 9 of the Bingara Gorge Golf Course.

As part of the original design and siting of the golf course and peripheral planting, a Golf Safety Report dated 2010 was prepared by Graham Marsh Design to determine the centre line of play, and any required screen or residential planting to provide additional safety to future dwellings and residents on adjoining residential land from stray golf balls.

The residential land that is proposed to be subdivided in this DA and consideration of the safety of future residential dwellings on it was included in the safety assessment, although the subdivision pattern was unknown at that time.

Figure 15 below illustrates the safety recommendations that were considered by Lendlease during the finalisation of the design of the golf course. Relevantly, the recommendations relating to shifting of Hole 9 by 10 metres to improve safety to adjoining residential; and the residential planting shown adjacent to the eastern boundary of the proposed 15 lot subdivision area have been implemented and are in place.

On this basis, and given the distance of the proposed 15 lot subdivision from the tee and orientation of the hole and centre line of play, as well as the location and orientation of the future dwellings, there is unlikely to be any adverse impact arising from proximity to the golf course.

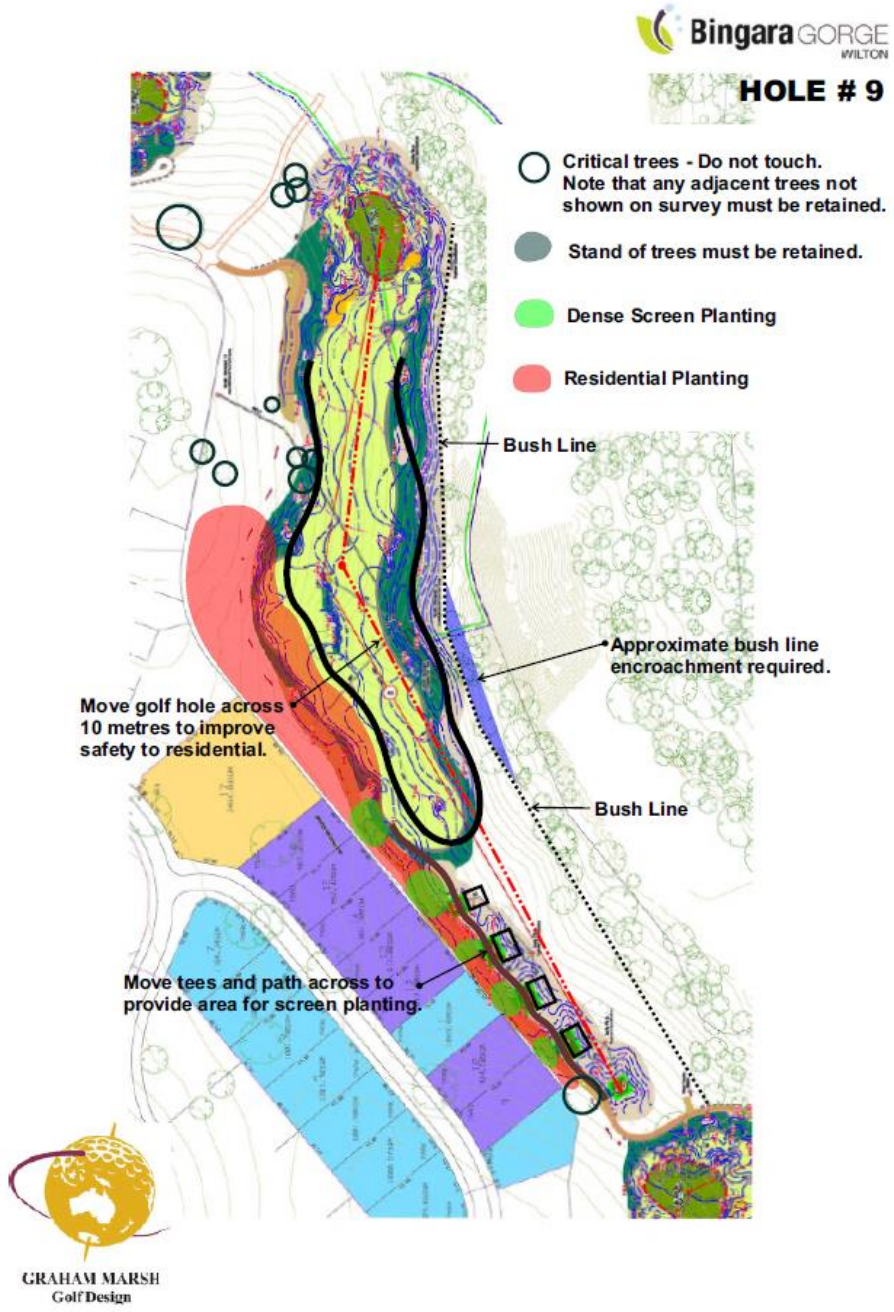

Figure 15 – Hole 9 Safety Recommendations
Source: Graham Marsh Golf Design

3.9 Construction Impacts

The Waste Management Plan will ensure that reuse and recycling of construction materials is maximised both on and off the site and that waste is minimised as far as practicable.

The Site Waste Minimisation and Management Plan related to the proposed works will be provided prior to the issue of a construction certificate, subject to a Condition of Consent.

For the proposed area of subdivision, erosion and sediment control plans have been prepared and accompany this application (**Appendix D**).

4.0 Conclusion

The proposed development is acceptable in terms of the matters for consideration under section 79C(1) of the EP&A Act. Accordingly, the DA is considered worthy of support.