



Riverside at Tea Gardens Concept Plan Application

Environmental Assessment

Volume 1A

for
Crighton Properties Pty Ltd

January 2012

0043707 - Final

www.erm.com

PART 3

This Chapter provides details of consultation that was undertaken with government agencies and community during the preparation of the EA.

7.1**AGENCIES**

As outlined in *Chapter 1*, Crighton Properties began the process of seeking approval to develop a substantial portion of this site for residential purposes and for a nine hole golf course and tourist facilities in 2002. Since that time there have been a number of key consultation activities with the Department of Planning and Infrastructure (previously the Department of Planning and the Department of Infrastructure, Planning and Natural Resources) and other key stakeholders. With specific reference to the preparation of this EA, the following government agencies have been consulted:

- Great Lakes Council;
- Department of Planning (Sydney and Regional offices);
- NSW Department of Environment, Climate Change and Water (DECCW);
- NSW Department of Industry and Investment, Division of Primary Industries, Aquatic Habitat Protection Unit;
- Mid Coast Water;
- Land and Property Management Authority;
- NSW Catchment Management Authority (Hunter and Central Rivers);
- NSW Police Service;
- Rural Fire Service;
- Karuah Aboriginal Land Councils (KALC); and
- Port Stephens Great Lakes Marine Parks Authority.

7.2**RECENT MEETINGS WITH DP&I AND OEH**

Since the previous Concept Plan and Project Application were withdrawn, the following consultation has occurred with the DP&I (formally Department of Planning DoP) and OEH (formally DECCW) (refer to Meeting Minutes in *Annex N of Volume 1B*):

- 29 March 2010 – Meeting between Crighton Properties, ERM, Cumberland Ecology and DECCW to discuss completion of new ecological assessments (including proposed methodology), the proposed modified development footprint, biodiversity offsets, regional fauna corridor and works to be completed prior to additional meetings;
- 4 August 2010 – Meeting between Crighton Properties, ERM and with DoP to provide an update on progress in addressing key concerns of ecology, water management and site services since the previous application was withdrawn, including details on the proposed biodiversity offset strategy. It was proposed that the project be declared as subject to Part 3A with only a Concept Plan to be lodged and, if approved by the Minister, it was also proposed that subsequent development applications would be assessed by Council under Part 4 of the EP&A Act.;
- 22 September 2010 – Meeting between Crighton Properties, ERM, Cumberland Ecology and DECCW in response to lodgment of Preliminary Environmental Assessment with DoP requesting a response by 1 October 2010. Update provided on changes to development footprint in response to concerns raised by the PAC including removal of 71 lots from Precinct 1. Discussion regarding Cumberland Ecology liaison with DECCW as ecological assessment works progressed. DECCW provided views on PAC footprint, shortfall in BioBanking credit methodology and added constraint of regional habitat corridor. DECCW questioned management of open space and wildlife corridor areas and suggested dedication to Council. General discussion of Community Association, PAC report based on inadequate vegetation mapping and quality of EECs on site;
- 29 November 2010 – Meeting between Crighton Properties, ERM, Cumberland Ecology and DoP to provide update on progress since previous meeting on 4 August 2010 including lodgment of EA for adequacy review. Discussed off site offset and review of Biobanking methodology and potential impacts on the project. Questions raised with DoP regarding DGRs and EA reflecting offset site as part of application. Discussion on the timing of adequacy review and advantages of having EA on exhibition over holiday period; and
- 12 January 2011 – Meeting between Crighton Properties, ERM and DoP to discuss overview of adequacy review, including key reasons the EA failed to meet adequacy and the need for detailed justification chapter. Justification of development footprint was discussed including conservative nature of identifying EECs on site in relation to soil types. Proposed Biodiversity offset was discussed. DoP confirmed that if a revised EA was submitted responding to feedback it would be unlikely that it would be referred to OEH and NoW for further review.

- 9 June 2011 - meeting between Crighton Properties, ERM and DP&I to discuss outcome of adequacy review. The Environmental Assessment was deemed to be adequate subject to some additional work being undertaken in relation to the key issues of Ecology, Water Management and Site Servicing. However DP&I strongly recommended that in the absence of adequate justification for a variance, the proposal should be modified to more closely align with the suggested PAC footprint. The application would be referred to the PAC for determination and, if approved, future development applications would be lodged with Great Lakes Council.
- 14 September 2011 - meeting between Craig Baumann (Parliamentary Secretary for Regional Planning and Member for Port Stephens), Tim Robertson Ministerial Advisor to the Minister for Planning and Infrastructure), DP&I, ERM and Crighton Properties to provide an overview to new government representatives. A way to address delays in securing agreement from OEH regarding offsite offsets was sought. Feedback was provided that EA would be exhibited as soon as additional information required by adequacy review was provided. Crighton Properties were concerned that failure to gain agreement from OEH and DP&I regarding offset strategy prior to exhibition would result in project refusal and DP&I agreed to convene a meeting with OEH once Biodiversity BioBanking credits were calculated.
- 12 January 2012 - meeting between Stuart Worthington, and Tom Fitzgerald (DP&I), Crighton Properties and ERM to provide updated EA and provide an overview of changes including updated soils and biodiversity assessments, BioBanking assessments and amendments to the water management system. ERM explained that legal advice had been received that identified that an Environmental Protection License was not required and outlined changes to the EA to make it a stand alone report. An updated capital investment value was requested.

In addition, GHD undertook consultation with OEH on the 18 October 2011 and with both OEH and DP&I on 15 and 23 November 2011 to discuss the Biodiversity BioBanking assessment. This consultation indicated that both OEH and DP&I would need estimates of BioBanking results for the PAC boundary before consideration of additional development outside this boundary.

7.3

COMMUNITY

Previous community consultation regarding the future development of the site aimed to ensure that the community was engaged in a shared vision.

A Design Forum was held over three days from 1 to 3 February 2006. The Design Forum related to the Myall Rivers Downs and Riverside sites at Tea Gardens and provided opportunities for the community and various government agencies to express their views on the future development of the Tea Gardens area.

A total of 143 people attended all or part of the forum, which included ten representatives from Great Lakes Council and over 100 community members.

The Design Forum included a site and context tour, presentations on relevant issues and constraints, community workshop and a design studio session. This led to a presentation to the community of the early basis for the concept plan. The community was able to submit feedback forms after the final presentation and a follow up newsletter was sent to attendees. *Volume 1B* of the Environment Assessment report provides the Design Forum presentation and additional information relating to the design consultations undertaken.

It was evident at the design forum that the community was passionate about maintaining the character of the village. The term character encapsulates density, walkability, tree lined streets, buildings setback from the street, natural beauty and accessible open space. Key community feedback from the design forum included the following comments.

- *“Tea Gardens – Hawks Nest is unique to NSW and Australia’s coast;*
- *we want focal points – they encourage people to meet;*
- *businesses and restaurants can provide an interaction between communities;*
- *we must strive for inclusiveness rather than divisiveness;’*
- *we need certainty for the town – a long term plan;*
- *we want an attractive place for people to live in and enjoy a healthy life;*
- *we need a quality streetscape to encourage walking;*
- *let us provide a model to guide growth areas in the future;*
- *let us develop a sense of informality, openness and flexibility to re-in force community spirit;*
- *we can create a town for all seasons with community and recreation facilities available all year round;*
- *we could enhance diversity of our culture by a series of small parks – within close proximity of all residents;*
- *we need meeting rooms and other places for us to meet and interact;*
- *let’s plan for fabulous outdoor eating spots;*
- *remember ‘Capability Brown’, who insisted on getting it right – he designed a streetscape that would look fantastic in 400 years time;*
- *let us strive for true coastal design to avoid brick and tile sterility;*
- *heritage isn’t brick and tile – let’s strive to improve housing design; and*
- *we want a connected community” (Design Forum Review 0306).*

The shared vision delivered by this approach helped form the basis for the Concept Plan.

A further community meeting was held on 26 April 2006 to discuss the Concept Plan. Once again, feedback was sought and the overall response was positive.

An Environmental Assessment Report for a Concept Plan and project application was prepared in accordance with the Director-General's Environmental Assessment Requirements (DGR's) issued on 16 September 2008. The Environmental Assessment Report was placed on public exhibition for a period of 30 days from 19 February 2009 to 20 March 2009.

The Department of Planning (DoP) appointed an Independent Hearing and Assessment Panel (IHAP), which was subsequently modified to a Planning and Assessment Commission (PAC), which also undertook an extensive public consultation process.

A public hearing was held on 7 April 2009. The following government agencies lodged formal submissions during the exhibition period or shortly thereafter:

- Office of Environment and Heritage;
- NSW Office of Water;
- Department of Primary Industry;
- Rural Fire Service;
- Roads and Traffic Authority;
- Hunter New England Health;
- Hunter and Central Rivers Catchment Management Authority;
- MidCoast Water;
- Great Lakes Council; and
- Busways.

In addition 18 submissions from members of the public were received which raised a wide range of issues including:

The need for wildlife corridors;

Flood impacts;

Traffic impacts;

Aboriginal Heritage impacts;

Sea Level Rise;

Social Infrastructure Provision;

Ecological impacts;

Stormwater Management;

Revegetation of disturbed areas;

Employment Growth; and

Cumulative Impacts.

Responses by the proponent were summarised and provided to the PAC and have been incorporated into this EA where appropriate.

7.4

PUBLIC EXHIBITION

Pursuant to section 75H of the EP&A Act, the EA will be placed on exhibition for no less than 30 days. During this time any person (including a public authority) may make a written submission to the Director-General concerning the concept plan.

The issues raised in any submission received will be provided to Crighton Properties and the Director General may require Crighton Properties to submit a response to the issues and a preferred project report that outlines any proposed changes to the project to minimise its environmental impact and any revised statement of commitments.

If the changes to the nature of the project are considered significant the Director-General may require the proponent to make the preferred project report available to the public.

Chapter 8 provides a detailed justification for the Concept Plan in response to the concerns raised by the Planning Assessment Commission (PAC).

8.1

OVERVIEW

The DP&I appointed a Planning and Assessment Commission (PAC), to undertake an expert review of the previous Concept Plan and Project Application. The terms of reference of the PAC were focused on the review of two main areas of concern namely: the ecological constraints of the site and the hydrological issues associated with groundwater, the SEPP14 wetland and flooding. The PAC could not reach a unanimous view on recommendations concerning the ecological constraints of the site, and subsequently issued two reports, one being a majority report, the other a minority report. The PAC submitted its reports to the DoP in July 2009.

The PAC concluded in its majority report that the vegetation mapping contained within the EAR was “grossly deficient” and that it was “not possible to define the boundaries of the endangered ecological communities and threatened species habitat with certainty”. The PAC also went on to conclude that “Because of the variable quality of the fauna survey work, it is equally possible that the presence of threatened species has been missed in some parts of the site, or they are not recorded as being present at all.” The PAC strongly suggested that new vegetation mapping and fauna habitat mapping be undertaken with any revised proposal so as to properly inform any impacts upon the site and required mitigation measures.

Additional ecological and hydrological assessments have been undertaken across the site which has resulted in modifications to the development footprint of the Concept Plan as shown in *Figure 2.1*. A significant biodiversity offsetting package is also proposed, to be achieved through the implementation of the offset strategy prepared by GHD in consultation with OEH and DP&I. A commitment to this effect is included in the Draft Statement of Commitments included in *Chapter 9*.

Despite the lack of proper constraints mapping the PAC majority report went on to recommend a Developable Area, shown in *Figure 8.1*, as:

“It is consistent with the regional planning strategy which identifies a surplus total development capacity to allow for the fact that many individual sites proposed for development will have significant ecological constraints that prevent achievement of their notional yields”.

As discussed in *Section 3.3* the Mid-North Coast Regional Strategy identifies minimum dwelling requirements for the Manning Valley - Great Lakes subregion of 15,000 dwellings, urban development within development footprints not ecologically or otherwise constrained is paramount to meeting the minimum dwelling requirements and being able to accommodate the projected population growth in the region. The Concept Plan has been refined to avoid identified areas of ecological constraints based on updated biodiversity assessments with unavoidable impacts to be adequately offset through the commitment to implement the biodiversity offset strategy. .



Figure 8.1

PAC Suggested Potential Developable Area Diagram

Client:	Crighton Properties Pty Ltd	
Project:	Concept Plan 2011 Environmental Assessment Riverside at Tea Gardens	
Drawing No:	0043707h_CP_EA_11_C027_R0.cdr	
Date:	06/12/2011	Drawing size: A4
Drawn by:	JD	Reviewed by: SO'C
Scale:	Refer to Scale Bar	

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Source:
Crighton Properties Pty Ltd -PAC Report

R0	Preliminary Issue	06-12-11	JD
Suffix	Revisions	Date	Init



The PAC took a constructive feedback approach within the majority report, which it suggested may be “more likely to lead to an optimal outcome for the site”, by including a suggested potential developable area diagram (refer to Figure 8.1) with the following caveats:

- (i) *“There will undoubtedly be some variations to the indicative areas suggested as being available for development because they are based on the maps in the EAR and it is the Commission’s view that these maps understate the areas of significant habitat;*
- (ii) *The Commission notes that there are some areas containing endangered ecological communities and threatened species habitat within the area marked for potential development. The Proponent will need to address these either by protecting them or providing suitable offsets;*
- (iii) *Given the poor baseline information it is not possible to assess whether there are options for improvements within the non-developable area that might contribute to any offsets required under (ii); and*
- (iv) *That substantial further work is required to provide accurate information on which a proper assessment of potential ecological impacts can be based.”*

It is clear that the PAC’s recommendations (contained within the suggested development footprint) responded to its understanding of site constraints as portrayed within the base line mapping as well as recommendations for wildlife movement across the site.

Figure 8.2 shows the PAC suggested footprint overlaid onto the original constraints map contained within the previous application. The PAC suggested modifications can be broadly grouped into three parts:

1. In the North West - The PAC has suggested modifying the development footprint to allow for a widening of the movement corridor around the base of the Shearwater Rural Residential Estate. This would have the effect of allowing greater corridor width, preserving previously mapped EEC in the north west of the site and increasing the corridor interface to adjacent lands, in particular the Council reserve on Toonang Drive. The current Concept Plan is contained within the PAC suggested footprint at this location.

2. In the South East - the PAC suggested pulling development toward the west to avoid lower lying land (particularly in the south) and to avoid the presence of hollow bearing trees in this area. Most importantly, this would also avoid mapped EEC located in this area. In fact, it is the outline of mapped EEC which prescribes the line of the suggested development footprint in this area. The Concept Plan now avoids all but 3.1 Ha of mapped EEC in this area.
3. In the North East - the PAC suggested a widening of the east west green corridor on the site, this action would appear to both widen the existing proposed corridor for fauna movement whilst preserving a small number of additional hollow bearing trees in that location. The widening of the corridor in this area has been achieved through the retreat to the south of the development foot print. Hollow bearing trees are also to be retained in this area through the design of a low density Environmental Lodge development.

It is also clear from the PAC assessment, that in addition to a reconsideration of 'avoidance', further consideration needed to be given to 'mitigation' and 'offsetting' of impacts within any revised application. An Offset strategy is included as part of this application to achieve this PAC recommendation as outlined in *Section 6.9*.

8.3 REVISIONS TO BASELINE MAPPING

In accordance with the recommendations made by the PAC the proponent has undertaken completely new baseline ecological mapping for the site. This mapping was undertaken by Cumberland Ecology (2011) and forms the basis on which EEC determinations have been made and the BioBanking Assessment and offset strategy were developed by GHD. The baseline ecological mapping methodology (both fieldwork and mapping) was endorsed by OEH prior to any fieldwork being undertaken.

The baseline mapping lead to the preparation of a draft “Vegetation Assessment” which was subsequently provided to OEH for review. A copy of the revised mapping prepared by Cumberland Ecology is reproduced in *Figure 6.11*.

Whitehead and Associates have also undertaken a detailed analysis of soil conditions on the site to determine the origin of the soil in order to determine correct EEC boundaries.

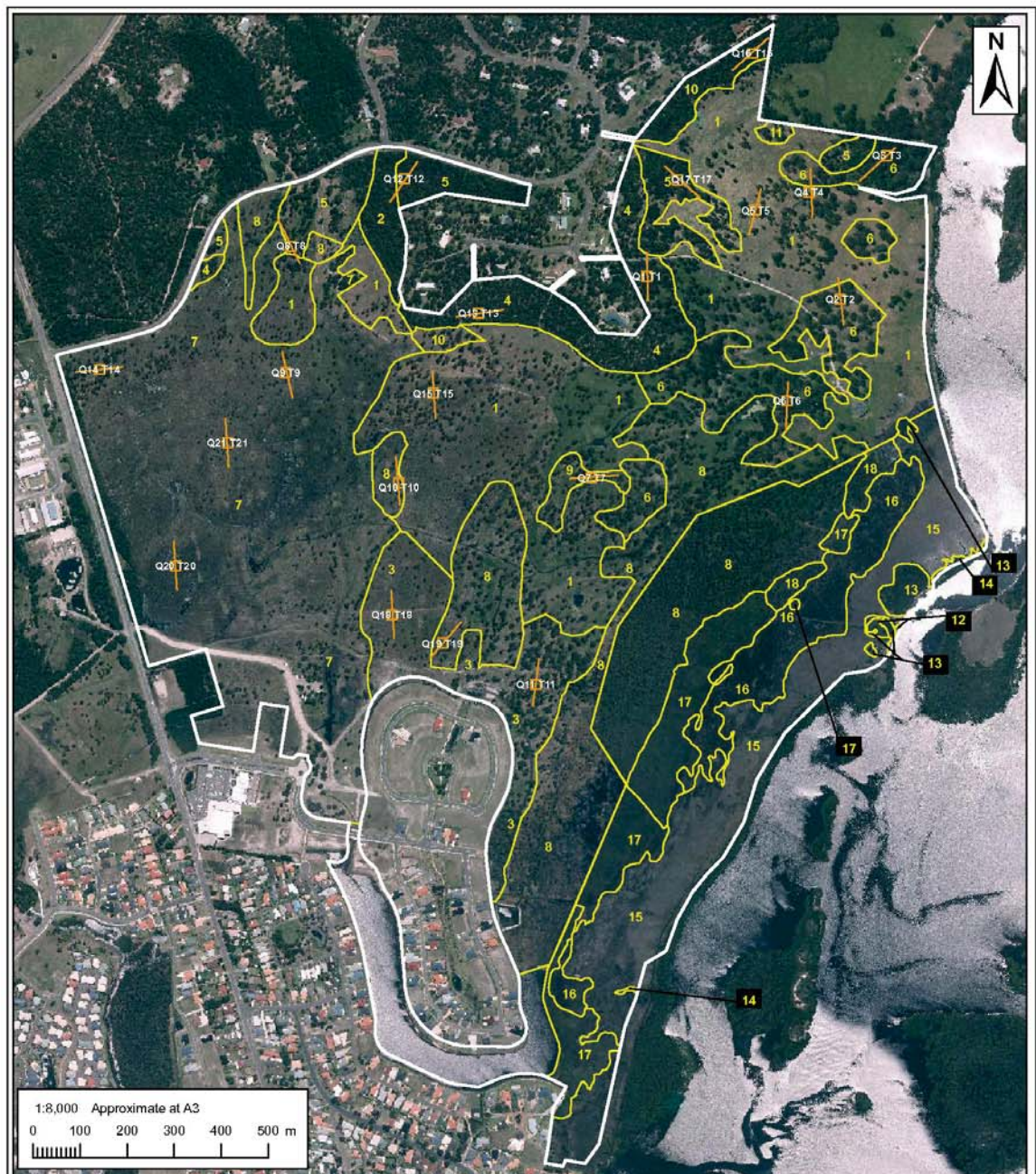
8.4 COMPARISON OF ORIGINAL AND REVISED BASELINE MAPPING

Figure 8.3 provides a comparison of the original Conacher Environmental mapping and the revised vegetation mapping by Cumberland Ecology. It should be noted that the Cumberland Ecology mapping has identified a larger variety of vegetation types upon the site. This is partly due to the detail provided in the revised mapping and also the re-definition of the vegetation types upon the site to accord with the more diverse community descriptions in accordance with OEH survey and assessment guidelines. More refined mapping in accordance with BioBanking vegetation identification has been undertaken by GHD (2012).

8.5 ADDITIONAL INFORMATION WITH REGARD TO BASELINE MAPPING

It can be seen that in the revised mapping much of the mosaic of vegetation types across the site (particularly in the west) fall into the floristic make up of communities which are consistent with the categorisation of Swamp Sclerophyll Forest EEC. The Cumberland Ecology 2011 considers the distribution of these EECs in accordance with the Scientific Committees Determination, by reference to the soil profiles provided in a specialist soils report prepared by Whitehead and Associates (2011).

Whitehead and Associates were engaged to undertake a review of soil types present upon the site to address the lack of the soil type information required for the correct categorisation of previously identified potential *Swamp Sclerophyll Floodplain Forest EEC*. This work focussed on identifying soils required for EEC designation in accordance with the definitions contained within the final determinations of the NSW Scientific Committee, as well as recent rulings by the NSW Land and Environment Court.



Original plan produced in A3 colour. Flora survey locations are approximate and have not been fixed by land survey. Plan for indicative purposes only. Not for detailed measurement. *Subject Site boundary subject to final survey.

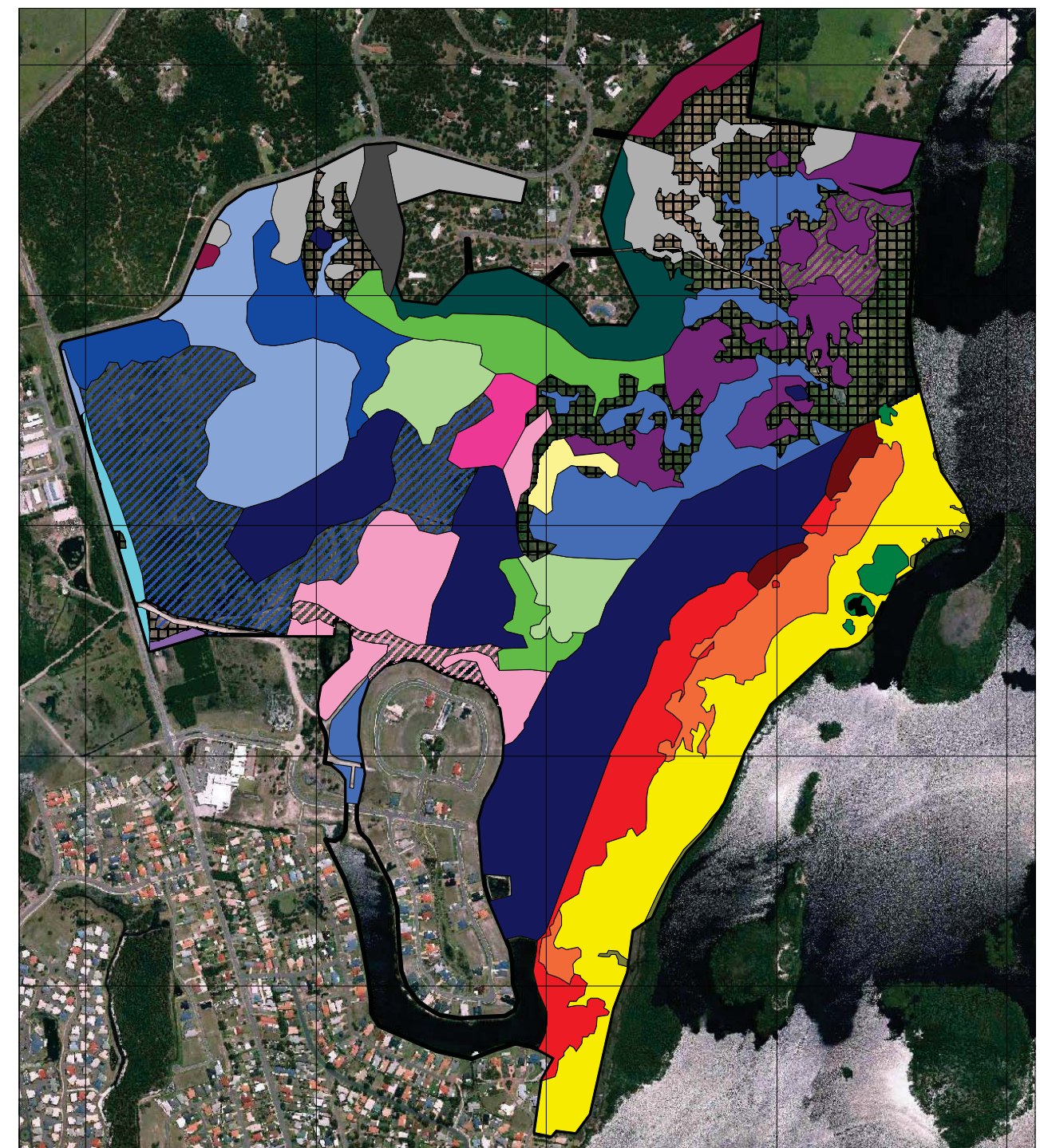
Legend				
	1	Pasture with Scattered Trees	7	Woodland (<i>Eucalyptus resinifera</i>)
	2	Acacia / Melaleuca Regrowth Scrub	8	Woodland / Open Forest (<i>Eucalyptus robusta</i>)
	3	Open Forest (<i>Corymbia gummifera</i>)	9	Woodland (<i>Eucalyptus signata</i>)
	4	Open Forest (<i>Corymbia maculata</i> , <i>Eucalyptus paniculata</i>)	10	Woodland/Open Forest (<i>Eucalyptus umbra</i>)
	5	Open Forest (<i>Eucalyptus microcorys</i>)	11	Pine Forest (<i>Pinus eitelli</i>)
	6	Open Forest (<i>Eucalyptus pilularis</i>)	12	Disturbed Estuarine Vegetation
			13	Casuarina forest (<i>Casuarina glauca</i>)
			14	Mangroves (<i>Avicennia marina</i>)
			15	Saltmarsh (<i>Juncus kraussii</i>)
			16	Rushland (<i>Baumea juncea</i>)
			17	Scrub (<i>Melaleuca ericifolia</i>)
			18	Papertank Forest (<i>Melaleuca quinquebaryia</i>)

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Figure 2.1
Vegetation Communities and Flora Survey Locations
Riverside, Tea Gardens

Source: Aerial © Department of Lands (2007)

Comparison of Original Vegetation Mapping



Legend		
	Subject land	
	Dry Forest/Woodland Communities	
	<i>Eucalyptus pilularis</i> Open Forest	
	<i>Eucalyptus pilularis</i> Derived Grassland	
	<i>Corymbia maculata</i> - <i>Eucalyptus paniculata</i> Open Forest	
	<i>Eucalyptus umbra</i> Open Forest	
	<i>Eucalyptus microcorys</i> Open Forest	
	<i>Eucalyptus microcorys</i> Open Forest (<i>Melaleuca regrowth</i>)	
	<i>Eucalyptus signata</i> Woodland	
	Wet Forest/Woodland/Scrub/Heath Communities	
	<i>Corymbia gummifera</i> Open Forest (<i>Corymbia gummifera</i> - <i>Eucalyptus resinifera</i>)	
	<i>Corymbia gummifera</i> Open Forest (<i>Corymbia gummifera</i> - <i>Angophora costata</i>)	
	<i>Corymbia gummifera</i> Derived Grassland	
	<i>Angophora costata</i> - <i>Eucalyptus resinifera</i> Woodland (<i>Angophora costata</i> - <i>Eucalyptus resinifera</i>)	
	<i>Angophora costata</i> - <i>Eucalyptus resinifera</i> Woodland (<i>Angophora costata</i>)	
	<i>Eucalyptus robusta</i> Woodland/Open Forest (<i>Eucalyptus robusta</i>)	
	<i>Eucalyptus robusta</i> Woodland/Open Forest (<i>Eucalyptus robusta</i> - <i>Angophora costata</i>)	
	<i>Eucalyptus robusta</i> Woodland/Open Forest (<i>Eucalyptus robusta</i> - <i>Eucalyptus resinifera</i>)	
	<i>Eucalyptus robusta</i> Woodland/Open Forest (<i>Eucalyptus robusta</i> - <i>Eucalyptus resinifera</i> - <i>Angophora costata</i>)	
	Wet Heath	
	<i>Casuarina glauca</i> - <i>Melaleuca Regrowth Forest</i>	
	<i>Melaleuca quinquebaryia</i> Forest	
	<i>Melaleuca ericifolia</i> Scrub	
	Wetland Communities	
	<i>Casuarina glauca</i> Forest	
	<i>Baumea juncea</i> Rushland	
	<i>Juncus kraussii</i> Saltmarsh	
	<i>Avicennia marina</i> Mangroves	
	Exotic Communities	
	Pine Forest	
	Exotic Grassland	
	Disturbed Estuarine Vegetation	

Revised Vegetation Mapping

Source:
Conacher Environmental Group and Cumberland Ecology

Suffix	Revisions	Date	Init
R0	Preliminary Issue	06-12-11	JD
R1		11-01-12	JD

Figure 8.3
Comparison of Original and Revised Vegetation Mapping

Client:	Crighton Properties Pty Ltd
Project:	Concept Plan 2011 Environmental Assessment Riverside at Tea Gardens
Drawing No:	0043707h_CP_EA_11_C030_R1.cdr
Date:	11/01/2012
Drawing size:	A3
Drawn by:	JD
Reviewed by:	SO'C
Scale:	Not to Scale

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The methodology used by Whitehead and Associates to undertake this assessment relied upon both visual inspection and laboratory analysis of 23 test pits based on a 100m by 100m grid across the site. Test pit locations are shown in *Figure 8.5*.

Following observation and laboratory analysis, Whitehead and Associates concluded that the Riverside site consisted of defined areas of marine (beach barrier), Aeolian and erosion origin soil landscapes and that :

“The southern and eastern part of the site comprises sandy soils of marine (beach barrier) or aeolian origin (Tea Gardens soil landscape). This soil landscape does not meet the conditions for the Swamp Sclerophyll Floodplain Forest EEC.

The northern section of the site comprises clay and clay loam soils of erosional origin (Pindimar Road soil landscape) Soils of an erosional nature would not meet the edaphic and locational conditions for the Swamp Sclerophyll Floodplain Forest EEC.

The northwest portion of the site comprises sandy loam formed under estuarine conditions on a drained Holocene estuarine flat on a coastal sand plain (Bob’s Farm Soil Landscape). While the soils of this area have edaphic characteristics that meet the Swamp Sclerophyll Floodplain Forest EEC definition and this area is waterlogged at times the soils represent those of a distinctly different depositional setting to an alluvial environment.”

Based on the soils assessment by Whitehead and Associates (2011) and recent Land and Environment Court decisions Swamp Sclerophyll Forest is not considered as occurring above the 1- in-100 year flood line. On this basis Cumberland Ecology has mapped EECs occurring on site as shown in *Figure 8.4*. It identifies three different EECs on the site, namely Swamp Sclerophyll Floodplain Forest, Swamp Oak Floodplain Forest and Coastal Saltmarsh totaling 66 Ha in area. Only 3.1 Ha of EEC will be impacted by the proposed development.






The EEC status of vegetation types does not affect the number or type of ecosystem credits. For the purpose of BioBanking Assessment communities with the floristic composition of an EEC were entered as EECs.



Figure 8.4

Endangered Ecological Communities Recorded on the Subject Land

Legend

-  Subject Land
-  1-in-100 year Flood Line
-  Swamp Sclerophyll Floodplain Forest
-  Swamp Oak Floodplain Forest
-  Coastal Saltmarsh

Source:

Riverside Tea Gardens Biodiversity Mapping Report Cumberland Ecology December 2011 Fig 3.3

Client:	Crighton Properties Pty Ltd	
Project:	Concept Plan 2011 Environmental Assessment Riverside at Tea Gardens	
Drawing No:	0043707h_CP_EA_11_C042_R0.cdr	
Date:	11/01/2012	Drawing size: A4
Drawn by:	JD	Reviewed by: SO'C
Scale:	Refer to Scale Bar	

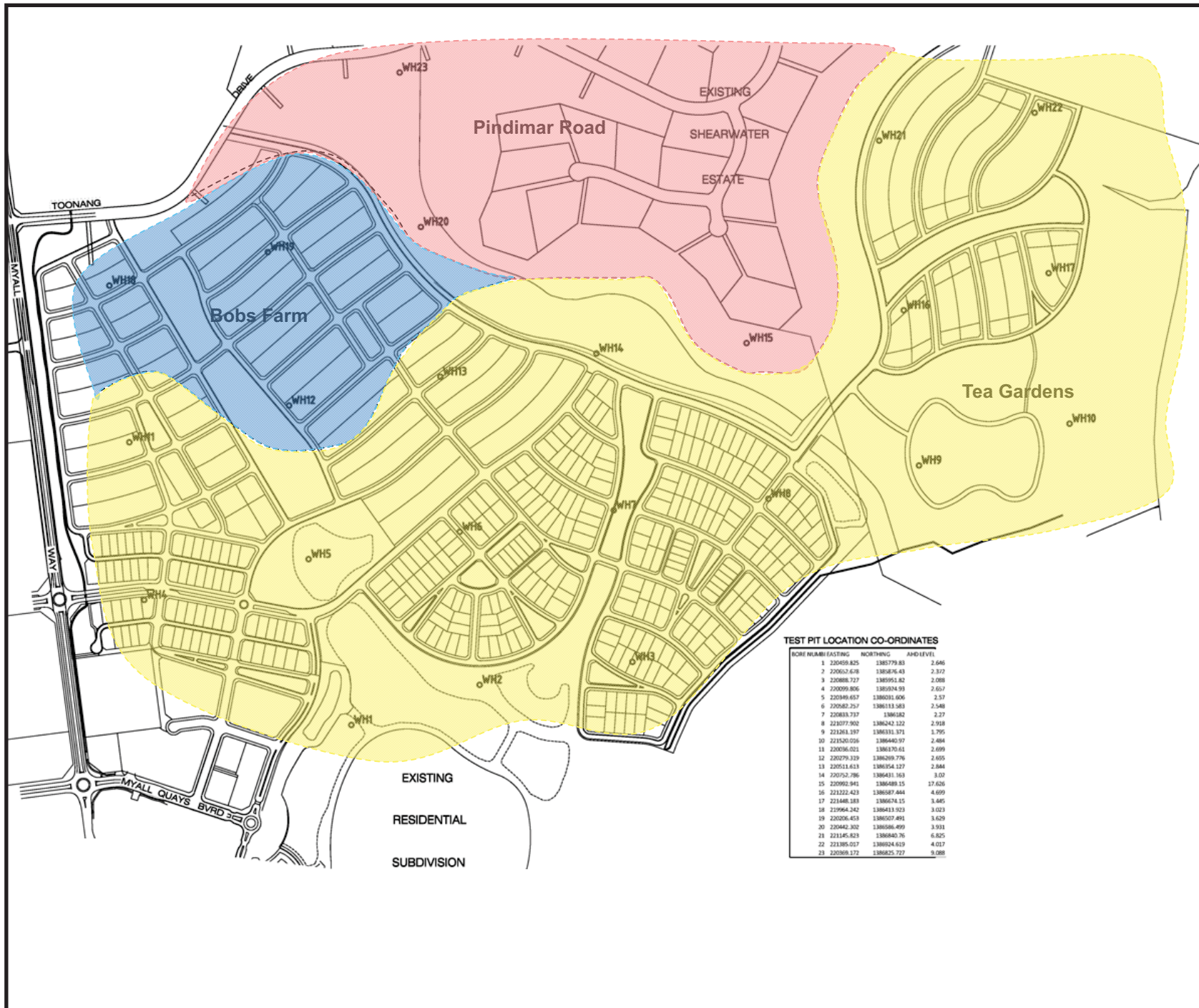
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R0	Preliminary Issue	11-01-12	JD
Suffix	Revisions	Date	Init





Legend

- ⊕ WH1 Test Pit Location
- Bobs Farm
- Pindimar Road
- Tea Gardens

Source:

Whitehead & Associates Environmental Consultants - Soils Assessment Riverside Tea Gardens August 2011 - Fig 3 Soil Landscape Units

Suffix	Revisions	Date	Init
R0	Preliminary Issue	09-01-12	JD

Figure 8.5

Soil Landscape Units and Test Pit Locations

Client: Crighton Properties Pty Ltd

Project: Concept Plan 2011
Environmental Assessment
Riverside at Tea Gardens

Drawing No: 0043707h_CP_EA_11_C032_R0.cdr

Date: 09/01/2012 Drawing size: A4

Drawn by: JD Reviewed by: SO'C

Scale: Not to Scale



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TEST PIT LOCATION CO-ORDINATES

BORE NUMBER	EASTING	NORTHING	AMD LEVEL
1	220458.825	138579.83	2.646
2	220662.678	1385876.43	2.372
3	220888.727	1385951.82	2.088
4	220999.806	1386094.93	2.657
5	220949.657	1386031.606	2.57
6	22082.257	1386113.583	2.548
7	220833.737	1386182	2.27
8	221077.902	1386242.122	2.918
9	221261.197	1386331.371	1.795
10	221520.026	1386402.97	2.484
11	220036.021	1386170.61	2.699
12	220279.329	1386269.796	2.655
13	220511.613	1386354.127	2.844
14	220752.786	1386431.163	3.02
15	220992.941	1386489.15	17.626
16	221222.423	1386587.444	4.699
17	221448.183	1386674.15	3.445
18	219964.242	1386413.923	3.023
19	220206.453	1386007.491	3.629
20	220442.302	1386006.499	3.511
21	221145.823	1386040.76	6.825
22	221385.017	1386024.619	4.017
23	220869.172	1386825.727	9.088

EXISTING
RESIDENTIAL
SUBDIVISION



ERM

PROPOSED MODIFICATION TO ORIGINAL FOOTPRINT AND OFFSETTING STRATEGY

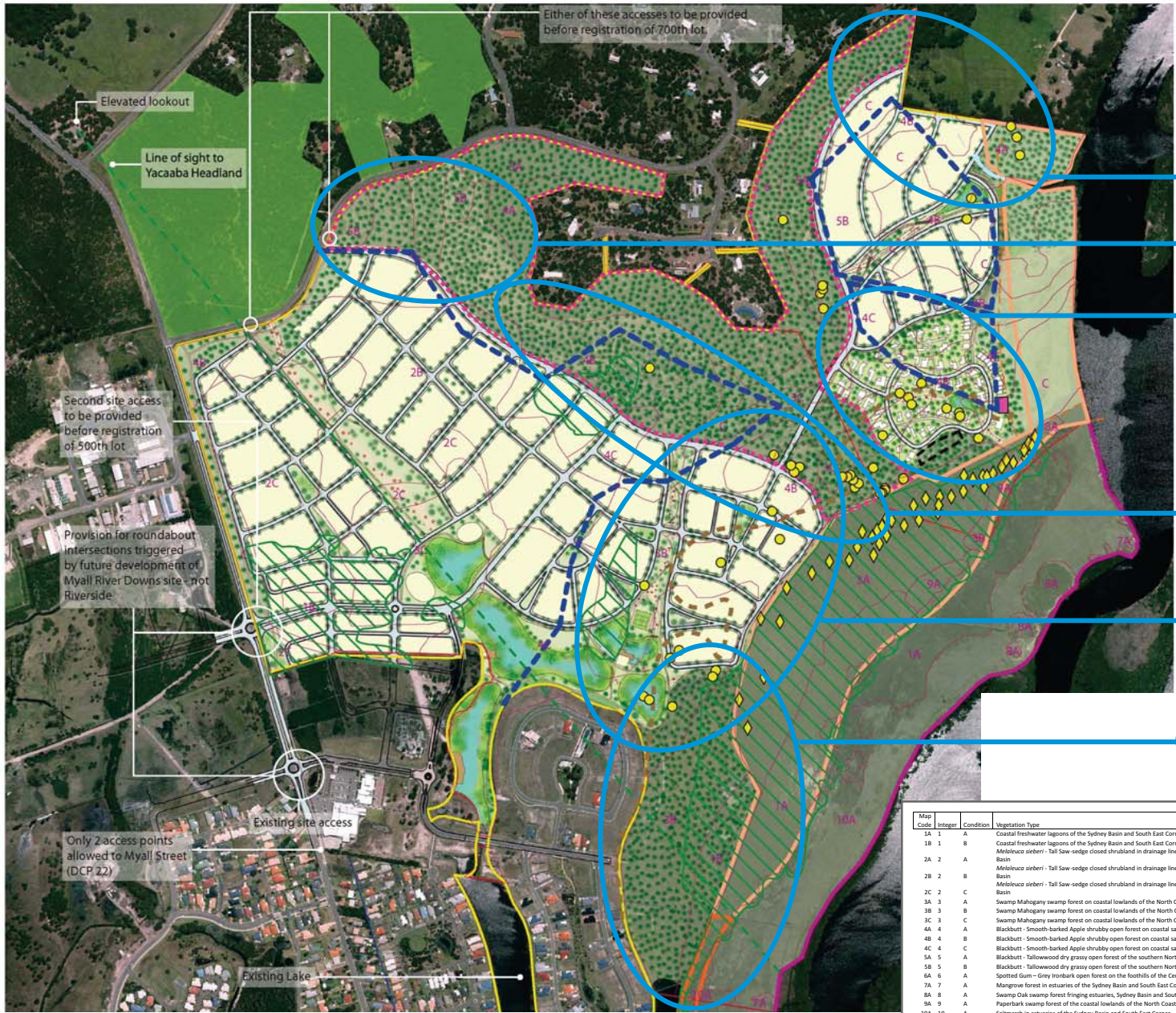
Based upon the new mapping prepared by Cumberland Ecology, the BioBanking assessment by GHD and additional soil profiling by Whitehead and Associates, a modified concept plan has been prepared and is represented *Figure 2.1*.

The modifications made to the previous development footprint include the following areas (as referenced on *Figure 8.6*):

1. In the North West - the proposed wildlife movement corridor has been widened and reshaped to provide a greater interface to the reserve lands off site. This modification matches the footprint modification in this area recommended by the PAC.
2. In the North - the proposed development footprint has been modified in order to reflect proposed development on the adjoining North Shearwater property. Development on the Riverside site will facilitate service and vehicular access connections to the proposed development on the North Shearwater Site.
3. In the central east, an Environmental Lodge development is proposed under a common title, which will result in low density development where all hollow bearing trees are retained (in addition to many others on site), and a number of architectural and behavioural controls implemented which augment the width of the east-west corridor on site to well over 200 m.
4. Urban development that had been proposed to cover 12.8 Ha has been removed from the south western area of the site (a total of 71 lots, a club house and water management ponds have been removed from this area). The area has been floristically mapped as Swamp Sclerophyll on Coastal Floodplain EEC and is directly linked to broader areas of similar vegetation in the adjacent land zoned 7(a) and 7(b). This area is low lying and mapped as potential wallum froglet habitat. This area now augments the area of on site conservation lands, and is proposed to be managed for conservation purposes in perpetuity.
5. Urban development has been removed from the southern edge of the proposed east west corridor (removing 54 lots from the proposed development) significantly widening this corridor to be 200m whilst also retaining a number of hollow bearing trees. DCP 22 prepared for the development of the Riverside Site at the time of rezoning required a 100m wide east west corridor, consisting of a 50 meter Core and 25 meter buffer on each side.

6. With respect to Area 6, the PAC had recommended a retreat to the west from development in this area, primarily to avoid areas mapped as EEC in this location (the suggested PAC footprint describes a line which follows the previously mapped extent of EEC in this area). The removal of development from this area had the additional benefit of preserving a small number of hollow bearing trees in this location (15 in total), as well as a small fragment of Wallum froglet habitat. Additional soil profile testing of this area has concluded that it is not dominated by EEC as was originally thought. It can be adequately offset by conservation in other areas.

Further the modifications discussed in Areas 4 and 5 above have allowed the majority of hollow bearing trees to be retained on site with only four hollow bearing trees to be removed from Area 6. Additionally on the recommendation of GHD, further development has been removed from Area 4 in lieu of Area 6, as it has been demonstrated that this area is more suited to conservation.



- Legend**
- Extent of Project Application
 - 7A Lands
 - 7B Lands
 - DCP Buffer
 - 2.1m AHD Contour
 - Recommended PAC Urban Footprint
 - Proposed Actual Green Buffer
 - Council Reserve
 - Designated Water Course
 - Location of Unknown Midden
 - Wallum Froglet Habitat
 - Existing Residence
 - Surveyed Hollowing Bearing Tree Locations
 - ◆ Approximate Identified Hollowing Bearing Tree Locations

Source:
 Crighton Properties - Constraints Plan R.C. - 37
 November 2011 Rev N

Suffix	Revisions	Date	Init
R0	Preliminary Issue	09-01-12	JD

Figure 8.6
Modification to Development Footprint

Client: Crighton Properties Pty Ltd
 Project: Concept Plan 2011
 Environmental Assessment
 Riverside at Tea Gardens

Drawing No: 0043707h_CP_EA_11_C025_R0.cdr
 Date: 09/01/2012 Drawing size: A4
 Drawn by: JD Reviewed by: SO'C
 Scale: Not to Scale



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Map Code	Integer	Condition	Vegetation Type	Condition
2A	1	A	Coastal freshwater lagoons of the Sydney Basin and South East Corner	Mod/Good/Good
1B	1	B	Coastal freshwater lagoons of the Sydney Basin and South East Corner	Mod/Good/Mod
2A	2	A	Melaleuca sieberi - Tall Saw-sedge closed shrubland in drainage lines on the Central Coast, Sydney Basin	Mod/Good/Good
2B	2	B	Melaleuca sieberi - Tall Saw-sedge closed shrubland in drainage lines on the Central Coast, Sydney Basin	Mod/Good/Mod
2C	2	C	Melaleuca sieberi - Tall Saw-sedge closed shrubland in drainage lines on the Central Coast, Sydney Basin	Low
3A	3	A	Swamp Mahogany swamp forest on coastal lowlands of the North Coast and northern Sydney Basin	Mod/Good/Good
3B	3	B	Swamp Mahogany swamp forest on coastal lowlands of the North Coast and northern Sydney Basin	Mod/Good/Mod
3C	3	C	Swamp Mahogany swamp forest on coastal lowlands of the North Coast and northern Sydney Basin	Low
4A	4	A	Blackbutt - Smooth-barked Apple shrubby open forest on coastal sands of the southern North Coast	Mod/Good/Good
4B	4	B	Blackbutt - Smooth-barked Apple shrubby open forest on coastal sands of the southern North Coast	Mod/Good/Mod
4C	4	C	Blackbutt - Smooth-barked Apple shrubby open forest on coastal sands of the southern North Coast	Low
5A	5	A	Blackbutt - Tallwood dry grassy open forest of the southern North Coast	Mod/Good/Good
5B	5	B	Blackbutt - Tallwood dry grassy open forest of the southern North Coast	Mod/Good/Mod
6A	6	A	Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	Mod/Good/Good
7A	7	A	Mangrove forest in estuaries of the Sydney Basin and South East Corner	Mod/Good/Good
8A	8	A	Swamp Oak swamp forest fringing estuaries, Sydney Basin and South East Corner	Mod/Good/Good
9A	9	A	Paperbark swamp forest of the coastal lowlands of the North Coast and Sydney Basin	Mod/Good/Good
10A	10	A	Saltmarsh in estuaries of the Sydney Basin and South East Corner	Mod/Good/Good



JUSTIFICATION AND BENEFITS OF PROPOSED DEVELOPMENT/CONSERVATION FOOTPRINT

A BioBanking assessment methodology has been used to estimate the quantum of offsets that would be required to compensate for potential impacts of the proposed development. This process has been applied to multiple development scenarios to optimise the balance between development and conservation footprints across the study area. Four potential development footprints have been considered:

- The original development footprint (November 2009), based on the original Concept Plan for the study area;
- The Planning Assessment Commission (PAC) footprint;
- The amended development footprint (February 2011) based on the results of the Cumberland Ecology assessment . and
- The proposed development footprint (December 2011), developed with specific reference to the supplementary GHD site survey data and detailed mapping to minimise impacts on native biodiversity.

The proposed development footprint was identified based on consideration of the credit impact rates (associated with development) and the credit generation rates (associated with conservation lands on-site). GHD's review of the results indicated the PAC boundary had included areas with lower credit impact rates than some of the areas proposed by the current development indicating that some areas of lower ecological values (predominately in the south and north east of the site) proposed for conservation were no different (and in some cases lower) than areas proposed by the PAC for development. It could therefore be argued that these areas outside the PAC boundary are just as suitable for development as areas proposed by the PAC. Similarly areas in the north of the site proposed for development by the PAC included vegetation of high ecological value and would be better suited to conservation. The outcome of this assessment is presented in *Table 8.1*.

Table 8.1 Comparison between the Development Footprint Options Credits Required and Biobank Credits Contribution

	Original development footprint	PAC suggested developable area	Amended development Footprint	Proposed development footprint
Area Impacted (ha)	119.15	73.7	98.8	94.4
Ecosystem credits required	4604	2948	3832	3675
Area retained- West biobank (ha)	26.36	39.04	39.04	41.23

	Original development footprint	PAC suggested developable area	Amended development Footprint	Proposed development footprint
Ecosystem credits generated - West biobank	202	294	294	332
Area retained - East biobank (ha)	49.56	70.02	58.31	63.91
Ecosystem credits generated - East biobank	381	572	461	523
Ecosystem Credit Balance	-4021	-2082	-3077	-2820
Estimated off site biobank requirement (ha) (1)	509.28	263.70	389.72	357.17
Estimated Size Range off site biobank requirement (ha)	380-515	190-270	290-395	260-360
Koala population species credits	-666	-10	-495	-401
Wallum Froglet species credits	-297	197	-39	138

1. It is difficult to estimate the size of offsite biobanks required as it depends on the ecological condition and other landscape factors. GHD has provided the above figures using a constant (though conservative) multiplier for comparison purposes only. The estimate quoted is expected to be an 'upper limit'.

2. Source: GHD 2012

For all development footprint options considered, there is a biodiversity credit deficit i.e. additional off site biobank site(s) would be required. The proposed development footprint has achieved a reduction in the credit deficit of 1201 ecosystem credits from the original development and a further 257 ecosystem credits or 8% compared to the amended development footprint. It should also be noted that the proposed PAC development footprint will also require significant biodiversity offsets (80% of the total biodiversity credits required for the development footprint), including an estimated area of 190-270 ha to be secured off site. The GHD BioBanking assessment has been able to increase the development lot yield while achieving economies in the number of biodiversity credits required by concentrating development in poorer condition vegetation: the preferred development footprint is 28% larger than the PAC development footprint but would only result in a 25% increase in the number of ecosystem credits required.

The proposed development footprint generates a requirement for less BioBanking credits per development lot than the suggested PAC footprint. This assists the economic viability of BioBanking credit delivery.

The proposed development/conservation footprint is considered the most appropriate layout for the study area, considering its residential zoning, and based on the following criteria:

- A reduction in the credit impact of over 1,200 credits when compared to the original development footprint due to additional avoidance measures adopted by the project since this time including:
 - Removing development proposed in the southern corner of the site and adding these lands to proposed conservation lands;
 - Reducing the development scale in the north eastern corner of the site and providing additional lands for conservation; and
 - Increasing the east-west corridor to a minimum width of 200 m throughout.
- Achieving economies in the number of biodiversity credits required by concentrating development in poorer condition vegetation as shown by:
 - An overall ratio of 38.9 credits per hectare for the proposed development footprint, versus
 - An overall ratio of 40 credits per hectare for the PAC development footprint.
- The proposed biobanks include all vegetation types being impacted within the preferred development footprint. This ensures that the types of ecological resources removed by the development would generally be conserved on site in some capacity.
- The proposed biobanks would generate a credit surplus for five of the vegetation types in the study area, including a credit surplus for three of the four over cleared vegetation types present in the study area.
- The most substantial offset deficit is with respect to *Melaleuca sieberi* - Tall Saw-sedge closed shrubland. The majority of the affected vegetation is in moderate or low condition and has been degraded by tree removal and grazing. Securing an offsite biobank with vegetation in good condition may be considered a good outcome to compensate for this loss.
- The proposed biobanks would generate a credit surplus for Wallum froglet species credits.
- It includes approximately 7.8 ha of disturbed, cleared land with very little biodiversity value. This area meets the BioBanking definition of cleared land and does not require biodiversity offsets.

- The development footprint considers the distribution of over cleared vegetation types on the site. Some areas put forward for development by the PAC boundary impacted on over cleared landscapes while conserving areas of vegetation of a lesser conservation status.
- Inclusion of additional lands in the conservation area as mentioned above also removes impacts to approx. 5 ha of vegetation associated with proposed stormwater management infrastructure. Both the original development footprint and the PAC boundary required significant earth works within areas proposed for conservation to enable water to be directed through the 'east-west corridor'. The additional lands proposed to be included in the corridor as part of the preferred development footprint will allow the perimeter road to act as the necessary diversion removing the need for diversions and a large detention basin to be constructed in this area.

The proposed development/conservation footprint provides:

- an 'east-west corridor' of a minimum 200 m wide ensuring suitable connection of the conservation lands in the east of the development to areas of high conservation values to the north and west; and
- a minimum 410 m wide corridor along the Myall River in the east of the site through until the cleared area of the north east corner.

The development will provide resources to invest in the rehabilitation and management of proposed conservation lands on site, thereby improving their condition and biodiversity values. These lands will also be conserved in perpetuity by a BioBanking agreement or equivalent conservation mechanism as agreed with OEH and DP&I.

- The development/conservation footprint proposed for the north-eastern corner of the study area has been designed to consider the new zoning plan and proposed development under the comprehensive Great Lakes Council Local Environmental Plan (LEP) including providing vegetated corridors to the west and along the riparian zone of the Myall River that integrate with those proposed immediately to the north. This approach ensures the Riverside development will not reduce the width of these corridors to a distance less than that immediately north of the site. Similarly, the development footprint proposed will also align with the footprint of the future development to the north.
- Conserving the large 'patch' of vegetation in the far north-eastern corner of the site. This 'patch' will be connected to a riparian corridor to the north of the site as proposed in the comprehensive LEP. Opportunities for connecting this vegetation with the conservation area to the south will be considered during the future development application associated with this area. Any future development applications will need to consider the provisions of the *Water Management Act 2000*, including the rehabilitation and management of riparian systems as approved by the NSW Office of Water.

- Providing a road network that aligns with proposed development to the north and also providing services to this area as required by Great Lakes Council once development consent is granted for the proposed development to the north.

8.8

COMPARISON OF PROPOSED CONCEPT PLAN AND PAC DEVELOPABLE AREA

Section 8.6 describes amendments made to the proposed development footprint and how they accord with the recommendations of the PAC. The key areas in which the current proposed development footprint differ from the recommended PAC footprint are highlighted as Areas 3 and 6 in Figure 8.6.

With respect to Area 3, the PAC had recommended a retreat to the north from development in this area, presumably to broaden the width of the east west movement corridor and to maintain a small number of hollow bearing trees in this area. The low density ecotourism proposal in this location has been specifically designed at half normal residential densities to maintain all hollow bearing trees on the site (in addition to other vegetation). The proposal will augment the core corridor width (which is undeveloped) whilst maintaining hollow bearing tree habitat.

With respect to Area 6, the PAC had recommended a retreat to the west from development in this area, primarily to avoid areas previously mapped as EEC in this location (the suggested PAC footprint describes a line which follows the previously mapped extent of EEC in this area). The removal of development from this area had the additional benefit of preserving a small number of hollow bearing trees in this location (15 in total), as well as a small fragment of Wallum froglet habitat.

Additional soil profile testing of this area has concluded that it is not dominated by EEC as was originally thought. It can be adequately offset by conservation in other areas.

This approach is consistent with the PAC report in which it stated;

“Given the poor baseline information it is not possible to assess whether there are options for improvements within the non developable area (outside the suggested PAC footprint) that might contribute to any offsets required....”

8.9.1

Ecology

In relation to ecology issues the PAC requested the following:

- i) *mapping and description of all vegetation communities on the site. Identification of communities should be based on floristics and structure of the vegetation. Assessment of structural values should take proper account of Specht et al. (1995);*
- ii) *Accurate identification of all endangered ecological communities on site. In determining the extent of the endangered Swamp Sclerophyll Forest community on site regard needs to be given to the NSW Scientific Committee's (2005) Final Determination for this community;*
- iii) *Accurate mapping of all vegetation communities identified on the site. It is expected that the existing vegetation mapping would be revised. Any new mapping should be undertaken in accordance with guidelines contained within the DECC publication 'Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities' (DEC – November 2004). The size of the minimum mapping unit should be stated and should be consistent across the site. The minimum mapping unit achieved in the existing mapping in the east of the site should be considered as a guide. The date of all aerial photography used needs to be stated. The original field data sheets filled out by the botanist who undertook the original quadrat and transect surveys on site should be provided. Field data sheets for any additional quadrats or transects deemed necessary should also be provided.*
- iv) *Accurate and comprehensive descriptions of all mapped vegetation communities*
- v) *Detailed, accurate and concise description of methods used to achieve the vegetation community map*
- vi) *Accurate assessment and mapping of ground layer vegetation condition. Since a large portion of the site has been recently slashed (the site was being extensively slashed on 28 March 2009) it is likely that any full reassessment of ground and shrub layer vegetation could not be undertaken effectively until after the vegetation has been allowed to regenerate (which is unlikely to be before late Spring). If it is not possible to accurately assess ground layer condition across the site then the precautionary principle, as advocated in the EAR, dictates that unless shown otherwise, the ground layer vegetation must be assumed to be in good condition.*
- vii) *Detailed, accurate and concise description of methods and criteria used to achieve the ground layer vegetation map*

- viii) *Accurate mapping of habitats, including movement habitat, of all threatened fauna species known or likely to use the site. Unless shown otherwise it must be assumed that all mapped habitat is of high quality.*
- ix) *Detailed, accurate and concise description of criteria used to determine suitable threatened fauna habitat. Assessments of habitat quality in the EAR are subjective.*

Data is required to substantiate statements such as “It is considered that the retained vegetation and habitats are of sufficient size and quality to support the long term viability of threatened species and endangered ecological communities known to occur within the site” (p. 58 Ecological Site Assessment – Riverside, Tea Gardens).

- x) *Accurate assessment of corridor values on the site. The criteria used to determine suitable corridor locations, widths and habitat types need to be documented. The long term viability of proposed corridors must also be demonstrated.*
- xi) *Losses of biodiversity must be offset in accordance with the DECC “Principles for the use of biodiversity offsets in NSW”.*

The PAC Report comments relate to the ecological assessment undertaken by Conacher Environmental. This ecological assessment has been replaced by a revised and updated biodiversity mapping prepared by Cumberland Ecology and biodiversity BioBanking assessment prepared by GHD (refer to Section 6.9). The PAC specific ecological comments are addressed in Table D.1 of Annex D contained in Volume 1B.

8.10

ABORIGINAL HERITAGE

Issues

The following was recommended by the PAC in relation to the previous Aboriginal Heritage Assessment (ERM, 2008) presented in the Environmental Assessment report:

- *the Proponent be requested to provide further details to confirm the adequacy of the survey sampling in relation to available areas of potential visibility and to further define the extent of Riverside_01;*
- *the additional definition of the extent of Riverside_01 and the adequacy of the buffer area to protect this site must be considered prior to approval of the concept plan;*
- *the proposed management plan in relation to Riverside_01 must consider the potential for impacts to this site as a result of signage and interpretation for use as an educational resource, in consultation with DECC and the KLALC; and*

- *the Proponent clarify the commitment or otherwise for KLALC to monitor construction activities and the mechanism to achieve long term protection of any keeping place established as part of this process.*

Response

As discussed in *Section 6.8.6* the study area was re-surveyed by the ERM Heritage consultant and Aboriginal representatives on 18 March 2009. The survey aimed to re-survey all landform units within the study area, relocate the site identified by Brayshaw in the 1980s and Riverside 01 identified by ERM in 2008. The assessment concluded:

“two Aboriginal heritage sites, both middens, are located within the study area. The proposed development will not directly impact these Aboriginal heritage sites; however there is the potential for indirect impacts which should be mitigated. The area suggested to be a PAD in the southern part of the study area has been determined to contain no archaeological potential and therefore requires no further management or mitigation”.

Suggested mitigation measures are included in the Draft Statement of Commitments (refer to *Chapter 9*).

8.11

HYDROLOGY

The proposed water management system on site (flooding, surface quality and groundwater quality) has been modified significantly since the previous application was withdrawn. The PAC Report outlined concerns with the previous water management system proposed due (in particular) to potential effects on;

1. Groundwater quality – and downstream ecosystems; and
2. Protection of development against potential flooding.

The process of reconsideration of the water management system commenced with a meeting with a representative of the NSW Office of Water (NoW) to formulate objectives for performance of the water management system. These objectives are reproduced in *Table 8.2* and *Table 8.3*. The greatest concern expressed by NoW related to the potential for untreated stormwater to pollute the quality of the groundwater system on site, due to the direct connection of water management basins with the groundwater. Some of these basins were proposed to be brackish in nature, which may also have resulted in saline intrusion into the watertable.

The primary objective agreed upon by the parties was that, rather than prohibit any connection between the water management devices and the groundwater, that all stormwater must undergo a primary treatment process which would raise the quality of the stormwater to at least the quality of the groundwater before any connection is made with the watertable. It was agreed that groundwater recharge was an appropriate method to balance water movement upon the site, subject to the recharged water meeting this water quality standard.

Table 8.2 Groundwater Management Principles and Objectives (Draft)

<i>Principle</i>	<i>Description</i>	<i>Specific Objectives</i>
1. Preserve Resource Value	The scientific, ecological, aesthetic and economic values of the resource should not be compromised.	<ol style="list-style-type: none"> 1. <u>Document Resource Extent</u> Quantify the aquifer resource in terms of quantity, flows and water quality. This is to include the key areas such as the interface with the fringing SEPP 14 wetlands and the region surrounding the existing quarry. The resource extent shall be supported by a detailed network of groundwater monitoring bores and an appropriate calibrated groundwater model. 2. <u>Assess Resource Value</u> Assess the scientific, ecological, aesthetic and economic value of the aquifer. 3. <u>Preserve or Enhance Resource Value</u> Ensure groundwater recharge systems preserve or enhance the existing resource value.
2. Sustainable Resource Use	The resource shall be utilised in a sustainable way so that ecological processes and biodiversity of dependent ecosystems are maintained and/or restored.	<ol style="list-style-type: none"> 1. <u>Threshold Values</u> Establish threshold values for any proposed extraction or recharge. 2. <u>Intergenerational Equity</u> Ensure that the opportunity of future generations for beneficial use of the groundwater resource is not compromised by the development. 3. <u>Sustainable Extractions</u> Ensure groundwater extractions are managed within the sustainable yield of the aquifer.
3. Preserve Water Quality	Suitable groundwater quality shall be maintained at all times for protecting dependent ecosystems.	<ol style="list-style-type: none"> 1. <u>No Net Increase</u> Ensure no net increase in groundwater nutrient and other contaminant concentrations. Where a reclaimed water supply is proposed for the development, this shall be accounted for in any impact assessment. 2. <u>Maintain Salinity Levels</u> Where possible, maintain salinity levels in accordance with pre-development levels. 3. <u>Recharge Systems</u> Where stormwater recharges groundwater directly through the use of 'window' lakes, lake inflow event mean (flow weighted average) concentration performance criteria are as follows (based on existing groundwater data): <ol style="list-style-type: none"> a. TN < 1.0 mg/L b. TP < 0.2 mg/L c. pH 4.0 □ 6.5 d. EC < 1500 µS/cm

<i>Principle</i>	<i>Description</i>	<i>Specific Objectives</i>
4. Apply the Precautionary Principle	Where knowledge is lacking, the precautionary principle shall be applied to protect groundwater resources and dependent ecosystems.	<p><u>1. Development Design</u> Where knowledge is lacking, ensure that groundwater systems are protected through the use of appropriate precautionary design practices which allow for some redundancy in design.</p> <p><u>2. Management Systems</u> Ensure that adequate and sustainable long-term management systems are in place that will preserve or enhance the resource value.</p>
5. Minimise adverse impacts on groundwater dependent ecosystems	Development shall aim to minimise any potential impacts on groundwater dependent ecosystems.	<p><u>1. Flow Patterns</u> Where possible maintain natural groundwater flow patterns / directions.</p> <p><u>2. Groundwater Levels</u> Do not disrupt groundwater levels which are critical for ecosystems.</p> <p><u>3. Hydraulic Gradients</u> Ensure hydraulic flow gradients are maintained between pre- and post-development situations.</p> <p><u>4. Water Balance</u> Pre-development groundwater water balances at fringing SEPP 14 wetlands areas should be maintained.</p> <p><u>5. SEPP14 Wetlands</u> Ensure that there is no disruption or significant change in terms of the supply of groundwater to the fringing SEPP14 wetlands adjacent to the site.</p>

Table 8.3 Surface Water Management Principles and Objectives (Draft)

The objectives of the NSW State Rivers and Estuaries Policy are to manage the rivers and estuaries in ways which:

- slow, halt or reverse the overall rate of degradation in the systems;
- ensure the long term sustainability of their essential biophysical functions; and
- maintain the beneficial use of these resources.

Principle	Description	Specific Objectives
1.	Those uses of rivers and estuaries which are non-degrading should be encouraged.	<p><u>1. Give preference to sustainable use options</u> The assessment of developable areas will identify the extent of acceptable uses.</p> <p><u>2. Promote ecologically sustainable development principles</u> Ensure that best practices are adopted for urban design and water cycle management.</p>
2.	Non-sustainable resource uses of which are not sustainable should be phased out.	<p><u>1. Activities incompatible with the resource and ecosystem conditions should be discouraged and phased out.</u> Ensure that best practices are adopted for urban design and water cycle management.</p>
3.	Environmentally degrading processes and practices should be replaced with more efficient and less degrading alternatives	<p><u>1. Estate design</u> Provide parameters for building design and materials to conform to the natural setting and coastal landscape</p> <p><u>2. Adopt best available management practices</u> Ensure that best practices are adopted for management of stormwater quantity and quality and groundwater quantity and quality</p>
4.	Environmentally degraded areas should be rehabilitated and their biophysical functions restored	<p><u>1. Rehabilitate degraded areas</u> Ensure that vegetation management practices will protect vegetation and habitats from the impacts of development.</p>
5.	Remnant areas of significant environmental values should be accorded special protection	<p><u>1. Protective strategies for wetlands and riparian corridors</u> Limit public access to the SEPP 14 wetlands The outlet from the existing detention lake into the wetland zone to remain unchanged Ensure a range of ecological management strategies are formulated to protect long term environmental and ecological values</p> <p><u>2. Water quality</u> The target reductions in average annual pollutant loads from planned development prior to achieve at least an overall:</p>

Principle	Description	Specific Objectives
6.	An ethos for the sustainable management of river and estuarine resources should be encouraged in all agencies and individuals who own, manage or use these resources	<p>(a) 85% reduction in average annual TSS load (b) 65% reduction in average annual TP load (c) 45% reduction in average annual TN load The likelihood of algal blooms occurring in the existing detention lake after development to be maintained at levels comparable to the likelihood under current conditions.</p> <p><u>1. Community Management</u> Ensure that the Community Management Statement promotes practices that support the sustainable management of the river and estuarine resources.</p> <p><u>2. Management of Water Quality Facilities</u> Ensure that water quality facilities are operated and maintained so as to protect the river and estuarine resources.</p>
<i>Managing Urban Stormwater</i>		
1.	Stormwater quantity management	<p><u>1. Stormwater quantity management</u> Ensure that the peak flows from the development are no greater than under current conditions for the 5 yr ARI, 20 yr ARI and 100 yr ARI events</p>
2.	Stormwater quality management	<p><u>1. Stormwater quality management</u> The target reductions in average annual pollutant loads from planned development prior to achieve at least an overall: (a) 85% reduction in average annual TSS load (b) 65% reduction in average annual TP load (c) 45% reduction in average annual TN load</p> <p>2. The likelihood of algal blooms occurring in the existing detention lake after development to be maintained at levels comparable to the likelihood under current conditions.</p>

It should be noted that the surface water runoff requirements are more stringent than the groundwater contact requirements. In summary, the agreed objectives for water management were:

1. Nil or Beneficial Effect ie, no increase in overall TSS, TP and TN exports to the Myall River (based on performance targets identified in the Great Lakes Council Draft Water Sensitive Design DCP (Version 1.1 May 2010); and
2. Median TP and TN concentrations in discharges to any window lakes/ ponds not to exceed limits identified by Martens and Associates in November 2009 (background levels), namely TN < 1.0 mg/L and TP < 0.2 mg/L.

These objectives are compatible with the Director General's Environmental Assessment requirements for water management.

In order to achieve these objectives, a number of wholesale revisions were made to the water management strategy for the site in comparison to the original scheme assessed by the PAC. The main differences can be seen in the comparison presented in *Figure 8.7* and are summarised as;

1. A large area of freshwater window ponds were removed, consistent with a corresponding reduction in development footprint;
2. Future ponds have been separated from the existing lake system by a land bund to allow the new ponds to operate at a higher design water level to provide future protection from climate change induced sea level rise, as well as to avoid any extension of the brackish (rather than fresh) water management devices;
3. Widow waterbodies have been removed from these areas and replaced with dry swales, which carry out primary water quality treatment without contacting the watertable; and
4. No additional channels or widening of existing channels are proposed to drain the existing lake system.

Figure 6.4 provides a diagrammatic summary showing how the stormwater management system works on site. Stormwater is either conveyed (whilst being treated) or infiltrated above the watertable in the upper reaches of the site - this is known as the primary water quality treatment. Any basins in primary treatment areas are proposed to be lined to ensure separation from the watertable (shown blue on *Figure 6.4*).

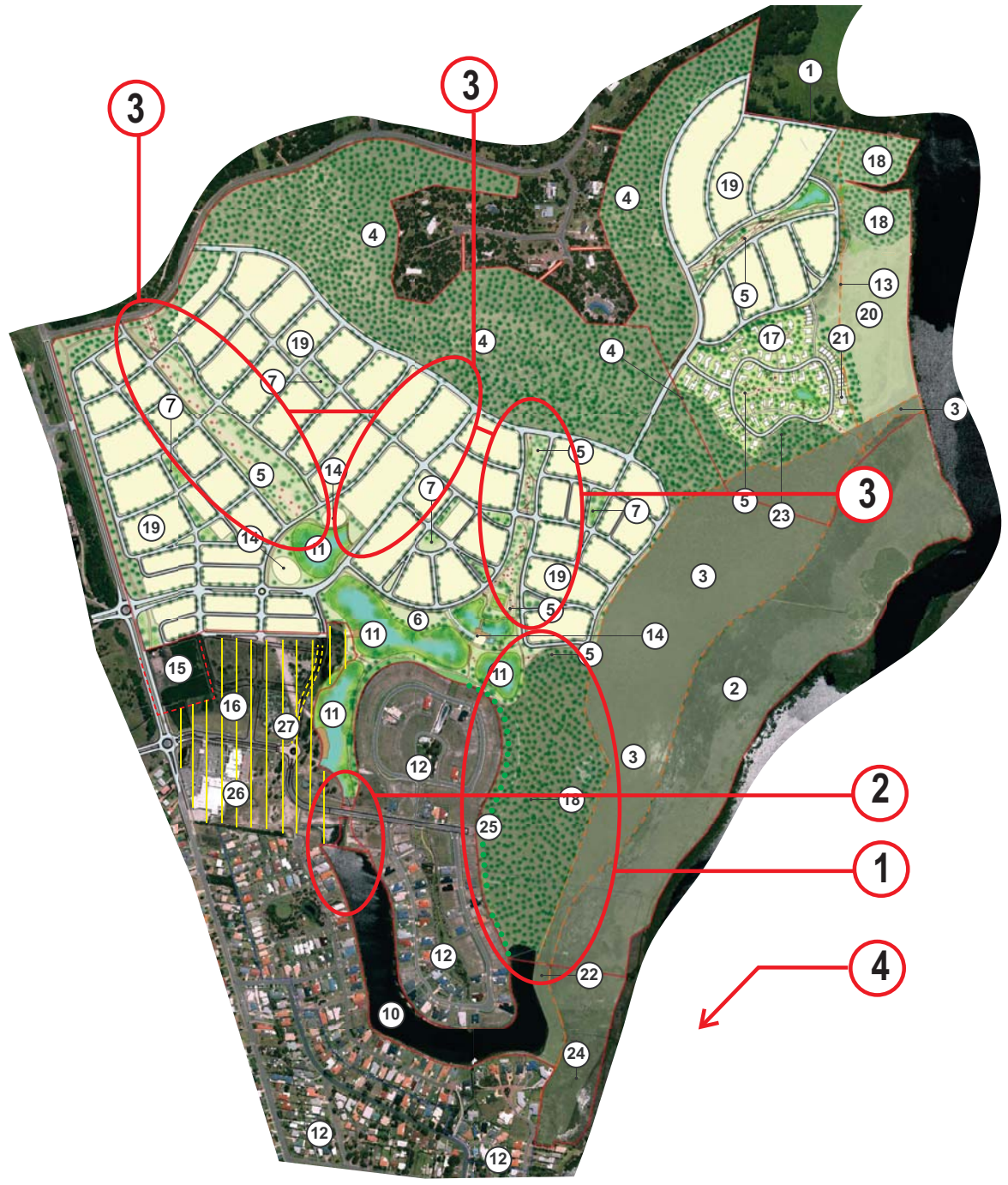
In the lower reaches of the site (after primary treatment has matched the quality of the groundwater) water is infiltrated and treated within a network of window lakes (this is the secondary treatment area) prior to cascading into the existing lake system (minor tertiary treatment) and eventually the Myall River, meeting required discharge objectives.

Off site runoff bypasses the on site water management system and is redistributed to the existing conservation area via a level spreader at a rate to match pre development flows, thus ensuring environmental flows are maintained to downstream receptors.

The primary and secondary treatment regime of stormwater is a significant departure from the previous proposal and ensures that no untreated stormwater is in direct contact with the groundwater on site.



Original Plan



New Plan

Source:
Crighton Properties Pty Ltd

Suffix	Revisions	Date	Init
R0	Preliminary Issue	09-01-12	JD

Figure 8.7
Comparison of Original and New
Water Management Strategies

Client:	Crighton Properties Pty Ltd		
Project:	Concept Plan 2011 Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707h_CP_EA_11_C029_R0.cdr		
Date:	09/01/2012	Drawing size:	A3
Drawn by:	JD	Reviewed by:	SO'C
Scale:	Not to Scale		



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Additionally, the separation of the new system from the existing lakes has allowed the new water management system to be designed to a peak operating discharge level of RL 1.4m, this level is 0.9m above the current minimum required discharge height, and thus allowing for climate change induced sea level rise forecasts.

The scheme has been modelled in detail to demonstrate;

1. Compliance with surface water quality discharge objectives;
2. Compliance with groundwater quality contact objectives;
3. Negligible impact on groundwater heights and quality at down stream receptors;
4. That the system continues to function in accordance with surface and groundwater objectives in the post climate change scenario (allowing for 0.9m of sea level rise and a 30% increase in rainfall intensity); and
5. To provide a safe environment free from flood inundation both now and in the post climate change scenario.

In relation to hydrological issues the PAC requested the following:

Issue

Improved groundwater monitoring and modelling should be undertaken to allow a proper assessment of the current groundwater conditions and the potential impacts of the proposal on the groundwater.

Response

The water management for the site has been redesigned significantly (particularly with the introduction of primary and secondary treatment devices) as follows:

1. Does not extend the existing brackish lake (previously proposed).
2. Does not maintain a direct connection to the existing brackish lake (ie. is a fresh water system).
3. Does not require any new channels through the wetland (previously proposed) nor augmentation of the existing channel.
4. Has reduced the area of open window water bodies from that previously proposed.
5. Treats surface water to equal to or better than groundwater quality through a range of primary water quality devices such as dry swales, bio filtration, lined wetlands and lined ponds prior to any connection with the watertable.

6. Provides additional surface water treatment through two freshwater (window) lakes and a major swale that conveys outflows from the northern freshwater lake south to the brackish lake. This swale replaces two large window ponds previously proposed upstream of the western arm of the brackish lake.

7. Has been designed to function under a 0.9 m sea level rise (including the effects of groundwater rise) and a climate change scenario comprising increased storm intensities.

8. Includes a recharge swale which buffers the SEPP14 wetland.

These measures will have the effect of removing any direct contact between untreated water in water management devices and the groundwater aquifer. This has resulted in a substantial reduction in the potential for any form of groundwater impacts.

Despite this 'reduced risk' solution, Martens and Associates have prepared a detailed groundwater model based upon additional ground water monitoring, prepared in accordance with advice and assistance received from the PAC, including continuous data-logging of groundwater levels during 2009.

The model considered both ground water quality and groundwater level, for the pre and post development scenarios, as well as considering the impacts of climate change.

This analysis has resulted in a number of observations and allowed conclusions to be drawn, all of which are summarised against the relevant issues documented in the following pages.

Issue

The beneficial use value of the groundwater beneath the site has not been properly recognised by the Proponent.

Response

Further consideration by Martens and Associates (2011) of the current groundwater quality on site, has lead them to conclude;

1. *"Groundwater quality is not to a standard to meet potable quality in accordance with the Australian Drinking Water Guidelines (NHMRC, 2004), primarily on the basis of acid levels, variable salinity and elevated concentrations of a range of analytes (Martens and Associates, April, 2009"; and*
2. *"The most significant beneficial use for groundwater in some locations of the site are for irrigation and ecosystem maintenance (Coffey, October 2007)".*

Despite the quality of the current groundwater not being suitable for drinking water purposes, the water management system proposed respects that downstream receptors may be susceptible to pollutants within the groundwater or changes to groundwater levels, therefore the proposal has been designed to ensure that groundwater will not be polluted at the point of contact with surface water. It follows this would not impact downstream receptors or have any significant impact on groundwater levels at downstream receptors.

Martens and Associates concluded;

1. *“Groundwater levels within the wetlands will remain essentially at their current level.*
2. *There will be no significant changes to groundwater flow budgets to the wetlands.*
3. *Existing groundwater flow paths within the wetlands will remain.*
4. *There will be no saline groundwater intrusion within the wetlands.”*

Issue

The presence of GDEs on the site has not been properly assessed. Nor has the groundwater assessment considered the potential impact of the proposal on all GDEs.

In particular, the Wallum Froglet habitat located on the western side of the property is clearly associated with and dependent on shallow groundwater, and would be expected to be sensitive to changes in groundwater levels. Additional Wallum Froglet habitat is understood to occur in other parts of the site. The groundwater impact assessment has not addressed the potential impact of the proposed stormwater treatment system on groundwater levels in the Wallum Froglet habitat areas.

Response

As previously stated, the water management proposal for the site has been redesigned significantly (particularly with the introduction of primary and secondary treatment devices) and this has had the effect of removing any direct contact between untreated water in water management devices and the groundwater aquifer. This means that any potential impacts on Groundwater Dependent Ecosystems (GDE) have been substantially reduced.

The Integrated Water Cycle Management Report contains an updated Hydrogeological Study and Groundwater Management Plan. The Hydrogeological Study describes the quality of the existing groundwater aquifer, and presents the objectives of the water management proposal in protecting the aquifer. It documents the two stage primary and secondary water treatment process to be implemented and describes how this will protect the existing aquifer from any deleterious impacts.

The Hydrogeological Study concludes that the groundwater levels, quality and flow rates will essentially remain the same in the adjacent conservation areas (within which Wallum froglet habitat largely resides). The assessment provided documents how objectives have been set to avoid impacts and demonstrates how the water management system will achieve these objectives.

It should be noted that development is proposed to occur in some areas where potential Wallum froglet habitat exists. These areas are proposed to be offset in the Riverside offset areas and through the implementation of the biodiversity offset strategy.

Issue

The Commission is not satisfied that the groundwater investigations or the groundwater modelling carried out have been sufficient to properly assess the effects that potential contamination of the groundwater from pollutants and nutrients in stormwater and from saline intrusion may have on the Myall River, the SEPP14 wetland and other GDEs on the site and downstream.

Investigations to evaluate the distribution of water quality (surface and groundwater) and the changes in that distribution under varying climatic, seasonal and tidal conditions have not been carried out.

Response

Groundwater investigations, modelling and reporting have been updated significantly since the previous application. Combined with the comprehensive changes to the proposed water management system (including no extension of the brackish lake system and no direct contact between groundwater and untreated stormwater), this additional modelling and reporting demonstrates a level of impact which is consistent with the stated objectives for performance. These objectives were formulated with the assistance of NoW and aim to protect GDEs.

Groundwater quality results were found to be generally below the key criteria for protection of species in marine water (90% protection) presented in the ANZECC (2000) guidelines, with the exception of some metal concentrations. Groundwater quality modelling indicates that the salt water interface would not be significantly affected by the development and groundwater level modelling indicates that there will be little impact within the wetland area.

Groundwater level changes resulting from the proposed development are assessed to be and 0.05 m to 0.1 m within the wetland area. Changes of this magnitude would be within the existing groundwater level variability and are therefore considered unlikely to adversely affect adjacent ecosystems.

Issue

The groundwater modelling should also assess potential impacts of the proposal on fluxes to the SEPP14 Wetland, as well as groundwater levels in the wetland area. These impacts should be assessed in relation to natural variability in both groundwater levels and fluxes.

Response

Both groundwater levels and fluxes were considered in further reporting by Martens and Associates (2011). The concluded as follows;

Preliminary Zone Budgets

The site was separated into the following zones for water budgeting assessment purposes.

1. Site Zone – this zone comprises the development site and external areas within the model domain which are not occupied by wetland; and
2. SEPP 14 Wetland Zone – this represents SEPP14 wetland areas to the east of the site.

The following comments were made by Martens and Associates:

1. On the basis of current groundwater data, there may be a minor reduction (approximately 5%) in net groundwater recharge to the fringing wetland. This is within expected existing annual water balance fluctuations and comes about through a marginal decrease in net recharge within the development site;
2. The modelled reduction is well within expected annual discharge fluctuation and is considered an acceptable outcome and
3. Further minor modification of the stormwater system could be undertaken at the project phase to elevate discharge rates to the SEPP14 wetland should that be required.

Preliminary Nutrient Fluxes

Using the zone water budgets defined above, nitrogen and phosphorus fluxes were estimated based on the limited existing groundwater chemistry data. The following conclusions can be drawn;

1. Results provide an overview of mass transport rates to the fringing wetlands and hence to the receiving waters;
2. Developed conditions show minor reductions to nutrient fluxes; and

3. Impacts of stormwater loads to the groundwater system have not at this stage been included in the nutrient flux analysis but should be included in the more detailed modelling at a later stage. It was noted that the brackish lake's total nitrogen and total phosphorous concentrations are lower than those of the groundwater system and therefore the lake will not provide a source of nutrients for the groundwater system.

Issue

In order to enable proper assessment of the potential impacts of the proposed water management scheme on the groundwater and in turn the wetlands to the east of the site, additional monitoring data are required. Data are required in additional locations, and transient (time-varying) data are also required across the site in order to assess the range of groundwater conditions both seasonally and diurnally.

Response

Additional monitoring (including continuous logging of groundwater data for a period of over four weeks) has been undertaken by Martens and Associates (2011), the results of which have been documented within the updated Hydrogeological Study (refer to *Annex F of Volume 3*). This additional monitoring and modelling, along with the wholesale revisions to the proposed water management system on site, has led to greater certainty that the aquifer and downstream ecosystems is unlikely to be impacted as a result of development.

Issue

It does not appear that the operation of the proposed stormwater treatment system has been assessed with consideration of climate change, especially the potential rise in sea level that would result in more frequent flushing of the saline detention lake. This would presumably lead to an increased potential for saline water intrusion into the aquifer system. The impacts of this on the groundwater resource and the ecosystems which it supports are not presented in the EAR and need to be assessed.

Response

The revised surface water system has been modelled for climate change scenarios in accordance with State Government adopted forecasts for climate change induced sea level rise. Potential impacts on both the surface water quality and groundwater systems have been considered in the modelling.

Previously, the approach to drainage design in Tea Gardens was to maintain drainage structure outlet levels at or above Mean High Water, at approximately RL 0.5m AHD. This is reflected in the levels of drainage structures throughout the existing Tea Gardens township, including all existing stages of the Myall Quays estate.

In order to account for the modelled impacts of climate change, modifications have been made to the previously proposed drainage regime in the Riverside proposal. In order to maintain the existing approach, the most significant change has been to lift the entire drainage system for the site, to ensure that the minimum invert of all new drainage structures in the proposed Riverside are now at or above the predicted worst post climate change Mean High Water of 1.4m AHD. This would ensure that the drainage system would remain unaffected by tidal waters. In discussions with Great Lakes Council's Engineering Department, this has been supported as an appropriate response.

The assessment has also lead to the separation of the newly proposed water management devices on site from the existing lake in order to;

1. Allow for new stormwater devices to operate at a level up to 900mm higher than the current stormwater devices in the 100 year long term projection, without any inundation by back flow from the existing lake system due to potential sea level rise. The outflow from all new stormwater treatment devices occurs at an absolute minimum invert level of 1.4m AHD. The current lake systems is approximately 0.64 m AHD;
2. Ensure there is no saline intrusion into the new stormwater management system by the existing lake system; and
3. Ensure devices which may not be in contact with the watertable, do not make contact due to rising groundwater heights resulting from sea level rise.

Monitoring has shown that there is a general groundwater flow from west to east, thus the risk of saline intrusion is minimal across the site. Additionally, the likely effects of sea level rise on groundwater heights dissipates the further away from the mean high water mark (MHWM)the receptor is on the site.

Issue

The use of recycled effluent has not been adequately assessed for the proposal, particularly in relation to a potential increase in the nutrient concentrations in either the groundwater, or the detention lake or other excavated ponds.

Response

An Integrated Water Cycle Management Plan (IWCMP) has been prepared for the proposed development in consultation with MidCoast Water and their consultants. The IWCMP recommends the use of recycled effluent for the purposes of toilet flushing, laundry uses and external water reticulation. The IWCMP has the support and endorsement on MidCoast Water, and is likely lead to an offer being made by MidCoast Water to supply reticulated treated effluent to the site in a third pipe.

Martens and Associates (2011) have considered the water quality likely to be offered by MidCoast Water for reticulation and the likely effects for household use, particularly in relation to external irrigation.

Martens and Associates (2011) have concluded as follows:

“Recycled Water Usage

We provide the following preliminary comments in relation to the risks that any potential irrigation of recycled water over the site would pose.

1. Indicative nutrient concentrations in recycled water would be 6 mg/L TN and 2.2 mg/L TP. These values are comparable to existing groundwater conditions, particularly nitrogen levels. We note there may be scope to reduce these concentrations with additional water treatment.

2. On the basis that lots will be of the order of 600 m² with irrigated garden beds and/or lawns being in approximately 200 m², some 90- 100 KL/ET/year (say 100 KL/dwelling/year) of recycled water would be expected to be used for outdoor purposes (assuming a total water consumption rate of 210 KL/ET/year).

3. Irrigation nutrient loads to the yard areas will therefore be of the order of 0.60 kg/year TN and 0.22 kg/year TP. It is important to note that these loads would be irrigated during dry times and generally onto unsaturated soils and not directly into the groundwater system. During times of high groundwater, there would be no need to provide additional irrigation water. Risks of direct recharge are therefore negligible.

4. Broad acre nutrient consumption rates for lawns and landscaped gardens are of the order of 200 kg/ha/year and 15 kg/ha/year phosphorus. On this basis, demand for nutrients in irrigated yard and landscaped areas will be of the order of 4 kg/year TN and 0.3 kg/year TP.

5. The above demonstrates that demand for nutrients in garden areas alone far outstrips that which can be supplied by the recycled water. In the case of nitrogen, demand is 660 % of expected supply, and in the case of phosphorus, demand is 136 % of expected supply. In the case of phosphorus, these preliminary estimates do not account for the significant sorption of phosphorous that would occur within soils.

6. The preliminary calculations are conservative as they do not account for the opportunity for nutrient uptake in areas outside those being irrigated, nor do they account for nutrient transformation which will occur within the unsaturated and saturated portions of the soil (eg. denitrification losses).”

Issue

For any revised proposal the Proponent should include assessment of the option that involves no extension to the existing detention lake and no other excavation into the water table. The assessment should include consideration of the use of recycled water, using nutrient loads based on actual discharges from the Hawks Nest STP, and a worst case assumption of some level of fertilizer use by residents in addition to recycled water.

Response

During initial discussion with DWE (co-ordinated by DP&I) it was mutually agreed between all parties that it would be impossible to arrive at a scheme which had no direct connection to the watertable – particularly in the lower reaches of the site.

Instead, attention turned to minimising the area of water management facilities that did have a direct connection to the watertable, and to set minimum water quality standards to be achieved before such a connection would occur.

The current scheme represents a reduction of over 70% in water management devices (on an area basis) in direct connection with the watertable. The remaining 30% are demonstrated to meet minimum water quality targets prior to a direct connection occurring.

The use of treated effluent has been considered (as described above) as has the use of water tanks in lieu of treated effluent. Water quality targets have been demonstrated to be achieved in both instances.

8.12

FLOODING

Issue

The recommended floor levels are sufficient to meet the DECC guideline provided the climate change ramifications can be considered “minor”, but that an additional freeboard (up to 0.5m) may have to be provided if the climate change ramifications are considered “significant”. The process for deciding whether the ramifications of climate change should be considered “minor” or “significant” is to some extent subjective, and needs to be based on a rigorous health and safety risk and economic cost analysis. Until this is done a precautionary approach would be appropriate, with the ramifications of climate change on this site being set at significant.

Response

At the time of the original submission, DECCW guidelines recommended a sensitive analysis approach to consideration of climate change, utilizing a low (0.18m), medium (0.55m) and high (0.91m) sea level rise forecast. Since this time, both DECCW and DP&I have adopted the 'high' forecast 0.91m sea level rise as the standard allowance for climate change induced sea level rise.

The 0.91m standard has been used in revised flood modelling for the site. As a result, site levels have been increased slightly, and it has been demonstrate that all proposed new lots will be above the future 1:100 year flood level (inclusive of climate change). Inundation plans have been provided for the 1:100 year river flood event, as well as a 1:100 year river flood, combined with a regional runoff flood event.

Both cases demonstrate that despite some temporary inundation of low lying open space areas and water management corridors, all proposed residential lots will be free from inundation, as will the local road network throughout the site, thereby providing safe egress in a flood event.

8.13

GROUNDWATER LEGISLATION AND POLICIES

Issue

The Commission considers that the Proponent should fully evaluate alternative stormwater treatment options that do not involve any further excavation into the water table, for any revised proposal.

Response

As previously outlined consultation with NoW resulted in a series of objectives being formulated for dealing with groundwater contact. It is clear that any scheme proposed for the site, will have some degree of direct groundwater contact within the site.

The revised scheme proposed has sought to minimise direct contact as much as possible, and demonstrates compliance with agreed objectives for contact as required by NoW.

Issue

Sampling conducted to date has confirmed the occurrence of low potential ASS below the water table in sporadic locations across the site, including within three of the four test locations in the proposed lake extension. Whilst assessment to date indicates that this issue is likely to be manageable, further investigation is required, in accordance with the ASSMAC Manual, in order to fully understand the potential impacts associated with the disturbance and treatment of these potential ASS.

Following further investigation, the ASS management plan should be revised to consider:

- The likely volume of material and extent of treatment required for excavations below the water table for drainage ponds and specific infrastructure such as the sewage wells. The location of borrow pits to bury excavated clay material should be established and the treatment areas for liming of sand material should be specified. These treatment areas should be located outside any areas that are set aside for habitat corridors or vegetation offsets. The location, nature and operation of treatment ponds required to treat leachate and water pumped from excavations also needs to be established;*
- The potential occurrence of potential ASS and treatment required for establishment of the channel through the wetland;*
- Background surface and groundwater water quality, and potential interactions associated with the excavation, dewatering and treatment of potential ASS; and*
- Potential impacts, groundwater monitoring and contingency measures for dewatering effects on potential ASS adjacent to the lake extension and drainage pond*
- excavations;*
- The potential effects of lime treated sand on vegetation growth also needs to be established and considered in the placement of this material.*

Response

The revised proposal is vastly different from that previously considered by the PAC. The following differences are important to note.

1. The extent of waterbodies required to be excavated has been reduced by over 20% compared to the original excavation area. The excavation which is nearest the Conservation area is now over 150m away from the land zoned Environmental Protection 7(b);

2. Of the remaining 80% of excavation area, 70% will not contact the watertable (these excavations are for primary water quality management purposes only);
3. The existing channel through the SEPP No 14 wetland is not proposed to be widened, deepened or augmented in any way, nor are any new channels proposed to be created; and
4. The current brackish lake system is not to be extended in any way. All new excavations are separated by land bunds from existing water management devices.

Despite this significant reduction in terms of extent and location of proposed excavation which results in markedly reduced potential risk to the environment, an Acid Sulphate Soils Assessment Management Plan (Coffey and Partners, 2011) (refer to *Volume 4*) has been provided to accompany the Concept Plan. The Acid Sulphate Soils Assessment Management Plan sets out the principles to be considered in the preparation of detailed ASSMP which would accompany any future development application.

Any potential risks to the environment can be readily addressed at the development application stage.

8.15

COMMERCIAL AND RETAIL CENTRE

Issue

Given there is doubt about the need for a major expansion of the Myall Quays shopping centre having regard to the Council's population projections and the more recent DoP population update, the lack of a retail strategy, the potential economic and social impacts on the existing shops along Myall Street if the shopping centre is expanded, and the uncertainty as to the facilities and services that will be provided in the proposed extension area, the Commission considers it premature to recommend approval for the proposed retail/commercial centre expansion.

Response

The proposed commercial area has been removed from the current proposal. This area has been issued a waiver by the Department of Planning and Infrastructure from the requirement that prohibits further subdivision until an overall plan is prepared. The area exists on a separate title and under an independent Community Scheme under the Community Titles Act 1989.

8.16

COMMUNITY TITLE

Issue

Legal advice to DoP on the adequacy of the current terms of the Community Management Statements recommended a number of improvements to the detail of the Community Management Schemes to avoid ambiguity in the multiple schemes; ensure consistency with the detail of the concept and project application; and to clarify ongoing responsibility, rigor and review of community land management and maintenance.

Response

As highlighted in the review of the current Community Management Scheme, Community Management Statements are not easily amended, and require the resolution of the Community Association.

The proponent has made a commitment in the Statement of Commitments to pursue reasonable amendments to the current scheme resulting from any approval of the Part 3A Concept Plan, but cannot provide guarantees as to the outcome of any resolution of the Community Association in this regard.

8.17

SEWAGE TREATMENT CAPACITY

Issue

Preparation of an Integrated Water Cycle Management Plan (IWCMP) to be completed prior to approval. The IWCMP needs to address water supply, stormwater, sewage, recycling of effluent in an integrated manner, together with further consideration of STP capacity and consequent infrastructure staging considerations, in consultation with MidCoast Water and DECC.

Response

An Integrated Water Cycle Management Plan (IWCMP) has been prepared for the proposed development in consultation with MidCoast Water and their consultants (refer to *Volume 3*). The ICWMP addresses:

- Flooding and Drainage;
- Groundwater;
- Water Quality;
- Potable Water;

- Rainwater;
- Wastewater;
- Recycled Water; and
- Management Responsibilities and Actions.

The integrated water management system proposed for the Riverside site is based on a strategy which collects, detains and treats stormwater runoff in an integrated train of local, neighbourhood and regional facilities and integrates the detailed consideration of potable water, rainwater, wastewater and recycled water.

It is concluded that management of surface water using a number of lined ponds, lined wetlands, swales, basins, freshwater lakes and the existing saline lake will meet the water quality, and quantity objectives for the site set down by the various relevant authorities.

It is concluded that this scheme is the most likely to succeed in the long term and, if properly managed in accordance with the plan provided in ICWMP is likely to continue to perform at or near the already demonstrated performance levels.

In 2010 Worley Parsons assessed the potable water, recycled water and sewerage servicing options for Riverside at Tea Gardens. The investigation considered the Riverside at Tea Gardens development together with the entire catchment to be serviced by the Hawks Nest Sewage Treatment Plant. In particular, the three new developments Riverside at Tea Gardens, Myall River Downs and North Shearwater were considered. This assessment was carried out in full consultation with MidCoast water and in accordance with its requirements.

The details of the assessment of potable water, recycled water and sewerage servicing options for Riverside at Tea Gardens is included in *Section 6.3.1* with the full technical report attached in *Volume 3*. Based on its review of the assessment MidCoast Water has confirmed that the Riverside (subject to approval) will be serviced by sewer, water and recycled water for toilet flushing, laundry and outdoor uses.

8.18

JUSTIFICATION SUMMATION

The PAC's recommended development footprint responded to the understanding of site constraints as portrayed within base line mapping as well as recommendations for wildlife movement across the site as presented in the previous Concept Plan. In response to the concerns raised by the PAC, the following additional assessments have been undertaken:

- completely new baseline ecological mapping and reporting has been undertaken across the site (Cumberland Ecology, 2011) and a BioBanking Assessment (GHD 2012) has been prepared in light of these findings;
- a review of soil profiles on the site in order to correctly identify the potential extent of previously mapped EECs within the site boundaries (Whitehead and Associates, 2011); and
- updated Integrated Water Cycle Management assessment including Cardno (2011).

Key findings of the additional assessments were:

- the revised vegetation mapping has identified a larger variety of vegetation types upon the site, partly due to the detail provided in the revised mapping and also the re-definition of the vegetation types upon the site to accord with the more diverse community descriptions in accordance with OEH survey and assessment guidelines;
- A suite of the vegetation communities occurring on the subject land comprise species assemblages which correspond to the list of species provided in the final determination of Swamp Sclerophyll Forest. Despite this, the soils analysis undertaken by Whitehead & Associates (2011) across several areas of the subject lands indicates that soil types present within these areas are not of alluvial origin, which is inconsistent with the final determination.;
- the GHD BioBanking assessment highlighted the need for further offsets to be provided off site to augment on site conservation offsets in order to maintain or improve the ecological outcome for the site.
- the BioBanking assessment has been able to increase the development lot yield while achieving economies in the number of biodiversity credits required by concentrating development in poorer condition vegetation.
- the BioBanking assessment has shown that the PAC footprint does not necessarily conserve the highest conservation values on site and that the PAC footprint also requires significant biodiversity offsets, therefore the proposed development delivers a more balanced outcome;
- a number of wholesale revisions were made to the water management strategy for the site in comparison to the original scheme assessed by the PAC, including:
 - a large area of freshwater window ponds were removed, consistent with a corresponding reduction in development footprint;
 - future ponds have been separated from the existing lake system by a land bund to allow the new ponds to operate at a higher design water level to provide future protection from climate change induced sea level rise, as well as to avoid any extension of the brackish (rather than fresh) water management devices;

- window waterbodies have been removed from these areas and replaced with dry swales, which carry out primary water quality treatment without contacting the watertable;
- no additional channels or widening of existing channels are proposed to drain the existing lake system; and
- the separation of the new system from the existing lake has allowed the new water management system to be designed to a peak operating discharge level of RL 1.4m, this level is 0.9m above the current minimum required discharge height, and thus allowing for climate change induced sea level rise forecasts.

These assessments have resulted in modifications to the development footprint of the Concept Plan that avoids many constrained areas. In addition to a reconsideration of 'avoidance', further consideration was given to 'mitigation' and 'offsetting' of impacts within the Concept Plan.

The original Concept Plan has been amended resulting in the deletion of 71 lots in the south east corner close to the high value existing wetland communities, 54 lots on the southern edge of the east west wildlife corridor, as well as the inclusion of a wider wildlife corridor along the northern edge of the site. Residential lots have been moved from the north-west to the north east corner of the site.

Whilst the proposed development footprint differs slightly from the PAC identified 'developable area', additional ecological and hydrological investigations have supported development in areas outside of the footprint whilst ensuring the key ecological and hydrological values of the site are protected.

Areas outside the PAC suggested developable area are just as suitable for development as areas proposed by the PAC for development. The Biodiversity BioBanking assessment has demonstrated that through avoidance, mitigation and offsetting the proposed development can achieve a "no net loss" biodiversity outcome, that includes 'like for like' onsite conservation and a commitment to securing offsite biodiversity offsets at least equal to the biodiversity impacts of the proposed development. Combined with proposed biodiversity management strategies the proposal is considered likely to represent an improved biodiversity outcome, through avoidance of most valuable vegetation and habitat, improvements and ongoing maintenance of degraded areas and onsite conservation areas, and securing of offsite areas of high biodiversity value in perpetuity.

Whilst the purchase and retirement of offsite BioBanking credits (an integral part of the offsetting strategy) will represent a significant financial investment, the timing of the retirement of such credits, following initial project plan stages and onsite offsets, is critical to an economically viable development outcome.

9 STATEMENT OF COMMITMENTS

This Chapter includes Crighton Properties environmental management, mitigation and monitoring commitments which will be adhered to as the development proceeds.

9.1 INTRODUCTION

The commitments detailed in this section have been compiled based on the environmental assessments undertaken during preparation of this EA. They constitute a commitment from Crighton Properties, inclusive of allocation of responsibilities and timing, to implement measures to minimise all potential environmental impacts that have been identified through this EA and ensure that the project is environmentally, socially and economically sustainable.

9.2 DRAFT STATEMENT OF COMMITMENTS

Crighton Properties is committed to minimising the potential for environmental impacts from the proposed development. *Table 9.1* outlines the measures which will be implemented to manage, mitigate and/or monitor any deleterious environmental, social and economic impacts likely to be associated with the proposal.

Table 9.1 Draft Statement of Commitments

Item Number	Item	Commitment	Responsibility	Timing
1	Scope of Development	<p>The development of the subdivision will be carried out as outlined in the documentation and subdivision plans listed below, except where amended by other items of this Statement of Commitments.</p> <ul style="list-style-type: none"> • Environmental Assessment Report (EAR), prepared by ERM, January 2012 and supporting technical reports contained in Volumes 2-5; • Concept Plan drawings prepared by Crighton Properties (<i>Volume 2</i>). 	Crighton Properties	Ongoing
2	Statutory Requirements	<p>The following licences, permits and approvals will be obtained and maintained for the subdivision and construction of infrastructure:</p> <ul style="list-style-type: none"> • Development consent under Part 4 of the Environmental Planning & Assessment Act; • Construction Certificates for engineering works (including earthworks, soil and water management, clearing, roadworks, drainage, landscape, water supply, and sewerage) for each stage of the subdivision; • Compliance and Subdivision Certificates for each stage; • Road Opening Permit; • Section 138 Consent for roadworks (Roads Act 1993); • Essential Energy Design Certification; • Essential Energy Notification of Arrangement; • Telstra Compliance Certificate; • Department of Land and Property Information registration of the subdivision; • Section 73 Compliance Certificate from MidCoast Water. <p>Notice of Commencement of Building or Subdivision Work and Appointment of a Principal Certifying Authority is to be submitted to Council two days prior to commencing work.</p>	Crighton Properties	For the duration of subdivision

Item Number	Item	Commitment	Responsibility	Timing
3	Zoning	A commitment is made to investigate the potential rezoning of conservation corridors, tourist residential precinct and onsite conservation areas in the comprehensive Great Lakes LEP to an appropriate zone in consultation with Great Lakes Council.	Crighton Properties	Prior to the release of the Subdivisions Certificate for each stage.
4	Conveyancing	A final community title and community management plan will be prepared for each stage of the development.	Crighton Properties	Prior to the release of the Subdivisions Certificate for each stage.
5		Easements will be provided for utility services that encroach onto private land or common space.	Crighton Properties	Prior to the release of the Subdivisions Certificate for each stage.
6		Crighton Properties will prepare work as executed plans for construction work in each stage and provide such plans to the relevant authority for each stage.	Crighton Properties and the relevant authority	Prior to the release of the Subdivision Certificate for each stage.
7	Construction	Construction of the subdivision will be generally in accordance with the Staging Plan (R.C. - 08) prepared by Crighton Properties or as otherwise approved in Construction Certificate plans approved by an accredited certifier.	Crighton Properties	Ongoing
8		Construction work shall be carried out only between 7.00 am and 6.00 pm, Monday to Friday and 7.00 am to 5.00 pm Saturdays, excluding public holidays.	Crighton Properties	For the duration of the construction of the subdivision.
9		Construction of the subdivision will be generally in accordance with the CEMP, prepared by ERM, (2011d), which includes: <ul style="list-style-type: none"> • waste management controls; • flora and fauna management; • noise and vibration control; • air and dust management; and • stormwater and sediment control. 	Crighton Properties	For the duration of the construction of the subdivision.

Item Number	Item	Commitment	Responsibility	Timing
10		Inspections will be carried out by an accredited certifier and following each inspection compliance certificates will be forwarded to The Principal Certifying Authority.	Crighton Properties	For the duration of the construction of the subdivision.
11	Acid Sulphate Soils	All earthworks will be completed in accordance with the Acid Sulphate Soil Management Plan prepared by Coffey Geotechnics (2011), and provided in <i>Volume 4</i> of the EAR.	Crighton Properties and contractors	For the duration of the construction of the subdivision.
12	Ecology	Implement the Koala Management Strategy, prepared by Conacher Environmental Group (2011c), (provided in <i>Volume 4</i> of the EA).	Crighton Properties and Community Association	For the duration of construction of the subdivision.
13		The Ecological Site Management Strategy prepared by Conacher Environmental Group (2011b) (provided in <i>Volume 4</i> of the EA) will be implemented following further development and consultation with OEH and DP&I as part of offset strategy. Preparation and implementation of a Wetland Management Plan as recommended in the Wetland Assessment (provided in Annex D of the Biodiversity Mapping Report by Cumberland Ecology (2011) in <i>Volume 4</i> of the EA).	Crighton Properties	Prior to the release of the construction certificate for any stage of the development.
14		A drainage line systems will be incorporated throughout the site that will be rehabilitated with native species. Tree retention will also be a priority for these areas. A vegetation management plan addressing weed management, rehabilitation and replanting of native vegetation throughout the drainage line network will also be developed and implemented.	Crighton Properties	Prior to the release of the construction certificate for any stage of the development
15		A detailed landscaping plan will be prepared using endemic species.	Crighton Properties	Prior to the release of the construction certificate for any stage of the development

Item Number	Item	Commitment	Responsibility	Timing
16		<p>A habitat tree management plan will be developed and implemented that identifies important habitat trees to be retained, recruitment trees to provide long-term replacement hollows, possible tree replanting areas and management measures to protect habitat resources from future potential issues relating to human safety and senescent trees etc. This plan will apply to such areas as:</p> <ul style="list-style-type: none"> • The drainage line network • Proposed pocket parks • The streetscape • Public recreation areas 	Crighton Properties	Prior to the release of the construction certificate for any stage of the development
17		Implementation of appropriate stormwater and erosion and sediment control measures.	Crighton Properties	Prior to the release of the construction certificate for any stage of the development
18		<p>A final Biodiversity BioBanking assessment and offsetting strategy will be prepared in consultation with OEH and DP&I to determine the type and quantum of BioBanking Offsets required to compensate for the impacts of the proposed development. The strategy will be delivered in three stages:</p> <p>Stage 1 - Finalisation of Biodiversity BioBanking Offset Strategy which identifies the quantum of total offsets required. The strategy will determine the quantum of offsets to be delivered on site and off site with corresponding management actions (specific off site offset sites will not be identified at this stage).</p> <p>Stage 2 - Implementation and delivery of on site biodiversity offsets including drafting and implementation of management plans and retirement of BioBanking credits.</p> <p>Stage 3 - Implementation and delivery of off site biodiversity offsets including drafting and implementation of management plans and identification,</p>	Crighton Properties	<p>Stage 1 of the strategy will be achieved within 3 months of DA approval for stage 1.</p> <p>Stage 2 of the delivery strategy will be achieved prior to release of Construction Certificate for Stage 1.</p> <p>Stage 3 of the delivery strategy will be achieved Prior to release of Construction Certificate for Stage 5</p>

Item Number	Item	Commitment	Responsibility	Timing
		purchase and retirement of BioBanking credits.		
19	Bushfire Management	Asset protection zones will be established in accordance with the <i>Bushfire Protection Assessment – Riverside, Tea Gardens</i> report prepared by Conacher Environmental Group, 2011a. Asset Protection Zones will be located between the built form and areas of native vegetation to the west of the site. The APZs will provide a management buffer between these land uses. Clearing within the APZ will be minimized to maintain existing vegetation (as far as possible).	Crighton Properties	Prior to the release of the Construction Certificate for the respective stage of construction.
20		A site specific fuel management plan will be prepared that outlines fuel management within the Asset Protection Zones including maintaining native vegetation within the APZ's within fuel load requirements. This generally means marinating these areas with a discontinuous canopy, a maximum of 25% of the lower storey with the remaining areas 'slashed'.	Crighton Properties	Prior to the release of the Construction Certificate for the respective stage of construction.
21		A covenant will be placed on each applicable title requiring development to be constructed in accordance with the Australian Standard AS3959 'Construction of Buildings in Bush Fire Prone Areas'.	Crighton Properties	Prior to the release of the Subdivision Certificate for the respective stage of construction.
22		A fire hydrant supply will be installed in accordance with Australian Standard S2419-1 (1994).	Crighton Properties	Prior to the release of the Subdivision Certificate for the respective stage of construction.
23		A Bushfire Evacuation Plan will be prepared and incorporated into the Community Management Statement.	Crighton Properties	Prior to the release of the Subdivision Certificate for the respective stage of construction.

Item Number	Item	Commitment	Responsibility	Timing
24	Aboriginal Heritage	The midden site 'NPWS 38-5-148' identified as significant located within the SEPP 14 wetland and the midden site 'Riverside_01' located within the tourist precinct will be protected from all development activities.	Crighton Properties	For the duration of the construction of the subdivision.
25		During ground surface disturbance works in the event that cultural heritage material is exposed within the development area, all development works will immediately cease and a representative of the OEH and Karuah LALC will be contacted regarding further assessment of any cultural materials.	Crighton Properties	For the duration of the construction of the subdivision.
26		<p>The management measures detailed in Chapter 9 of the Heritage Impact Assessment (ERM, 2011a) will be implemented, including:</p> <ul style="list-style-type: none"> fencing the area of raised sand dune proximal to midden Riverside 01 to ensure that cattle are prevented from accessing this area; preparation of a management plan in consultation with the local Aboriginal community to ensure the long-term protection of Aboriginal objects; monitoring of clearing and initial excavation works as requested by the Karuah LALC; and a suitable area will be set aside, as required for the possible containment of any cultural heritage material that is uncovered during the construction works. This will be under the care and control of the KLALC in accordance with a management plan. 	Crighton Properties	For the duration of the construction of the subdivision.

Item Number	Item	Commitment	Responsibility	Timing
27	Water Cycle Management	Design and install water quality control measures and monitoring program substantially in accordance with the <i>Integrated Water Management Strategy</i> dated 2011, prepared by Cardno Willing (refer to <i>Volume 3</i> of the EA).	Crighton Properties	Prior to the release of the subdivision certificate for each stage.
28	Water Quality	Undertake water Quality monitoring in accordance with the proposed methods included in the <i>Integrated Water Management Strategy</i> dated 2011.	Crighton Properties in consultation with relevant authorities.	Prior to the release of the subdivision certificate for each stage
29	Community Facilities	Two clubhouses and recreational facilities will be provided in the development. Separate development applications will be lodged for the clubhouses and recreational facilities. The timing for the submission of applications and subsequent construction of the clubhouses will be consistent with the construction of stages as per the Staging Plan for the development, ensuring that the facilities are available when the relevant stages are released.	Crighton Properties	Prior to the release of the Subdivision Certificate for the respective stage of construction.
30	Social	The Principals of both Tea Gardens Public School and Bulahdelah Central School will be informed of the growth of the school age population in Riverside.	Crighton Properties	Ongoing throughout the development of the project.
31	Health	The approved Concept Plan will be forwarded to the Population Health Unit of the Hunter New England Health Service, to assist them in the planning for preventative health.	Crighton Properties	Following Concept Plan approval
32	Reticulated Services	Each residential lot will be provided with reticulated water supply, sewerage and underground electricity.	Crighton Properties	Prior to the release of the Subdivision Certificate for each stage.

Item Number	Item	Commitment	Responsibility	Timing
33		<p>Infrastructure services will be provided generally in accordance with the drawings prepared by Tattersall Lander (refer to Servicing Strategy, <i>Volume 5</i>, EA), namely Drawing Numbers:</p> <ul style="list-style-type: none"> • 20600198, Water Servicing Strategy; • 20600220; 20600222, Vacuum Sewer Servicing Strategy (sheets 1 and 2); • 20700087, Electrical Servicing Strategy; • 20700088, Communications Servicing Strategy. 	Crighton Properties	Prior to the release of the Subdivision Certificate for the affected stage.
34	Roads and Drainage	All roads will be constructed in accordance with Sheet 5 of the Engineering Plans prepared by Tattersall Lander and provided in <i>Volume 2</i> of the EA.	Crighton Properties	Prior to the release of the Subdivision Certificate for each stage.
35		Drainage will be constructed in accordance with Sheet 19 of the Engineering Plans prepared by Tattersall Lander and provided in <i>Volume 2</i> of the EA.	Crighton Properties	Prior to the release of the Subdivision Certificate for each stage.
36	Developer Contributions	<p>A Voluntary Planning Agreement (VPA), consistent with the draft VPA provided (refer to <i>Annex J, Volume 1B</i>), will be entered into by Crighton Properties with Great Lakes Council detailing the contributions to be made relating to:</p> <ul style="list-style-type: none"> • open space, arterial roads, Marine Drive embellishments and other miscellaneous items; and • material public benefits in the form of land dedication of open space, works, upgrading of Myall Road, and entry statements at the highway and Myall Street / Toonang Drive intersections. 	Crighton Properties with the Great Lakes Council	At the development application stage. Specific timing for the provision of contributions will be detailed in the VPA.
37	Precinct Management	Precinct Management Statements will be prepared for each precinct in accordance with the précis provided in Volume 1B Annexures and in accordance with any conditions of approval.	Crighton Properties	Prior to the release of the Subdivision Certificate for each stage.

This chapter provides justification for the project in terms of the suitability of site and public interest and a conclusion to the EA.

10.1

SUITABILITY OF THE SITE

Location

The Mid North Coast is recognised in the Mid North Coast Regional Strategy (MNCRS) as one of the fastest and most consistent growth areas of NSW, with the demand to live near the coast resulting in the majority of the anticipated growth being accommodated in existing identified growth areas, including Tea Gardens - Hawks Nest. In addition, the MNCRS also identified that recent road upgrades and development activity suggests that Great Lakes and Greater Taree areas, "...will experience revitalised in-migration and population growth" (DoP, 2007). The site provides an opportunity for the orderly provision of residential land in the recognised growth area.

The site is well located to enhance and extend existing infrastructure and services. It is easily accessible from the existing road network and well served by education and medical facilities as well as employment areas.

Revised Footprint

The PAC's recommended development footprint responded to the understanding of site constraints as portrayed within base line mapping as well as recommendations for wildlife movement across the site as presented in the previous Concept Plan. The current footprint has been substantially modified. Revised vegetation mapping has enabled more informed decisions regarding the proposed development footprint while allowing a better balance in terms of avoid, mitigate and offset principles. The Concept Plan has been amended resulting in the deletion of residential lots in the south east corner close to the high value existing wetland communities as well as the inclusion of a wider wildlife corridor along the northern edge of the site. Residential lots have also been moved from the north-west to the north east corner of the site.

Whilst the proposed development footprint differs slightly from the PAC identified 'developable area', additional ecological and hydrological investigations have supported development in areas outside of the footprint whilst ensuring the key ecological and hydrological values of the site are protected, including:

- the low density ecotourism proposal in the north east portion of the site has been specifically designed at half normal residential densities to maintain all hollow bearing trees on the site (in addition to other vegetation). The proposal will augment the core corridor width (which is undeveloped) whilst maintaining hollow bearing tree habitat; and
- additional soil profile testing within an area located to the west of the SEPP 14 wetland and wetland buffer (Area 5 within *Figure 8.6*) has concluded that it is not dominated by EEC as was originally thought. It can be adequately offset by conservation in other areas.

In addition to the changes to the development footprint, on site and off site conservation areas are proposed to achieve the “no net loss” objective incorporated into the BioBanking assessment which has been undertaken for the site. These amendments and supporting materials have been prepared in full consultation with OEH.

10.2 *PUBLIC INTEREST*

The development of Riverside is in the public interest because of the environmental, social and economic benefits resulting from the development of this residentially zoned land. Importantly, the community has informed the design of Riverside, with more than 100 community members participating in a Design Forum to create a vision for the development.

10.2.1 *Social*

Riverside will provide additional housing in Tea Gardens, which will contribute to housing choice and opportunities in the area. Demographic figures for household type by age indicate the predominance of couples without children (‘empty nesters’) and lone person households, which is indicative of an aging population. The proposal provides allotments that can accommodate a variety of dwelling types, which would appeal to a range of household types. The proposal will therefore contribute to a more diverse housing pattern within Tea Gardens.

The Concept Plan incorporates a range of community facilities, which will build on the enhancement of services already delivered by the existing Riverside commercial centre. This includes new community facilities, ability for internal roads to accommodate a bus route, a cycle and pedestrian network that connects all community facilities and a commitment to consolidate sporting and recreational facilities on one adjacent site as part of the Myall River Downs development.

10.2.2

Environmental

Riverside provides an orderly extension to the existing residential area, in a manner that responds to the sensitive coastal environment. The Concept Plan incorporates an open space network that provides for an integrated water management system and establishes a wildlife corridor in a manner that also provides for the recreational needs of the community.

Substantial areas of the Residential 2(f) zoned land are proposed to be protected and enhanced as open space / wildlife movement corridors, over and above those already protected within the Environmental Protection 7(a) and 7(b) zones.

On site and off site conservation areas are proposed in accordance with the BioBanking assessment prepared by GHD (2012) which will likely see combined offset lands, far greater in size than the development footprint, conserved in perpetuity for a beneficial biodiversity outcome.

10.2.3

Economic

The economic benefits of the construction phase are significant. Construction activities will contribute approximately \$256 million in local output across all sectors and an additional 1,557 equivalent full-time jobs.

The Estate's operations are expected to support 10 equivalent full-time jobs and \$0.7 million in wages per annum. Over an average 12 year project life cycle, this translates to a total economic benefit of \$8.4 million. Once in full operation, residential activity will support 13 equivalent full-time jobs and a direct pay packet of \$19 million per annum. This benefit is expected to accrue throughout the economic life of the project and represents a dynamic component of the total economic benefit.

Sales and marketing will support a transitional pay-packet of \$0.6 million and eight equivalent full-time permanent jobs over the eight to 10 year construction period (Parsons Brinkerhoff, 2010).

The economic benefits to the Tea Gardens/ Hawks Nest area created by the Riverside proposal will facilitate the growth anticipated by the Mid North Coast Regional Strategy as one of the fastest and most consistent growth areas of NSW. The regional and local jobs created by the Riverside proposal will support dynamic population growth within the area by offering a range of employment opportunities.

The Concept Plan has evolved in response to the various feedback which has been received and rigorous consideration of the constraints and opportunities associated with the site. This has resulted in a site solution which appropriately balances environmental and economic considerations. The Concept Plan is sympathetic to the surrounding built and natural context.

The proposal will provide additional housing choice in an area set aside for the purpose of urban development and includes water sensitive urban design measures, a substantial open space and drainage reserve network and on site and off site conservation areas.

The site can be serviced using innovative technology which will minimise any harmful impacts on the environment. It is consistent with the relevant State and local strategies, policies and guidelines relating to future development in the area and will enhance the existing character of Tea Gardens through its traditional neighbourhood design.

The economic benefits associated with this project include the creation of 1,557 local jobs across all sectors, spread over the anticipated 10 year life of the project. This project will assist in facilitating and accommodating the anticipated growth in the Mid North Coast and provide a holistic response to urban expansion in the Tea Gardens/ Hawks Nest locality.

Finally, the site is appropriately zoned for the proposed development and has been a keystone in adopted local and regional urban planning strategies for over a decade.

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