

Volume 1B:

Annex D: Response to PAC Comments

Table D.1: Response to Issues raised by the PAC

Issue	Reference Number	Comment	Response
Ecological Issues	1(a)	Accurate identification 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).	The biodiversity values of the study area have been re-assessed and re-mapped by Cumberland Ecology (December 2011) in accordance with the recommendations and feedback made by the PAC on the previous proposed concept plan and project application. Section 6.9 of the EA discusses the biodiversity values of the site with technical assessment reports contained in <i>Volume 4</i> .
	1(b)	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.	<p>Some vegetation types across the site (particularly in the east) fall into the floristic make up of communities which are consistent with the categorisation of Swamp Sclerophyll Forest EEC. The Cumberland Ecology Biodiversity Mapping Report (2011) assessment considers the distribution of these EEC's in accordance with the Scientific Committees Determination, including the influence of the soil profile.</p> <p>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 <i>Swamp Sclerophyll Floodplain Forest EEC</i>. 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.</p> <p>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 :</p> <p><i>"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.</i></p>

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			<p>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.</p> <p>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."</p> <p>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. Cumberland Ecology subsequently concluded (based upon this information) that 66 Ha of EEC is present upon the site (predominantly in the east of the site). It should be noted that only 3.1 Ha of EEC will be impacted upon by the proposal. The EEC status of vegetation types does not affect the number or type of ecosystem credits and for the purpose of BioBanking Assessment communities with the floristic composition of an EEC were entered as EECs.</p>
	1(c)	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	<p>Vegetation community mapping was undertaken by Cumberland Ecology as part of a revised <i>Biodiversity Mapping Report</i> discussed in section 6.9 of the EA (refer to Volume 4 for technical report).</p> <p>Cumberland Ecology conducted flora surveys in accordance with the standards provided in the (then) DEC Threatened Biodiversity Survey and Assessment Guidelines for Development and Activities (Working Draft) (DEC (NSW) 2004) and the BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECC 2009).</p>

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		<p>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.</p>	<p>These surveys involved the following:</p> <ul style="list-style-type: none"> • Vegetation sampling within quadrats (20m x 20m) to obtain information on floristic composition and community structure; • Random meander surveys to detect additional flora species not recorded within the quadrats; • Targeted searches for threatened flora known or considered likely to occur within the subject land; and • Targeted searches for endangered ecological communities (EECs) known or considered likely to occur within the subject land. <p>Habitat assessments were undertaken in accordance with the methodology within the BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECC 2009). Fauna surveys have been conducted on the subject land over the past two decades. As these surveys were completed recently and were comprehensive, it was not considered necessary to undertake additional fauna surveys for the preparation of this report. Survey methods utilised by Conacher included:</p> <ul style="list-style-type: none"> • Amphibians: habitat searches, pitfall trapping, nocturnal habitat searches, opportunistic survey, call playback, spotlighting; • Birds: opportunistic survey, winter bird survey, call playback, spotlighting; • Mammals: trapping (ground and arboreal), pitfall trapping, hair tubes, diurnal observation, koala spot surveys, call playback, spotlighting, anabat detection, harp traps; and • Reptiles: habitat searches, pitfall trapping, opportunistic survey, spotlighting.

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	1(d)	Accurate and comprehensive descriptions of all mapped vegetation communities.	Vegetation communities are described within Chapter 3 of the <i>Biodiversity Mapping Report</i> (refer to <i>Volume 4</i>).
	1(e)	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.	Cumberland Ecology conducted flora surveys in accordance with the standards provided in the (then) DEC Threatened Biodiversity Survey and Assessment Guidelines for Development and Activities (Working Draft) (DEC (NSW) 2004) and the BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECC 2009). This included assessment of ground layer vegetation types. The Cumberland Ecology proposed methodology for vegetation mapping was endorsed by DECC prior to fieldwork commenced.
	1(f)	Detailed, accurate and concise description of methods and criteria used to achieve the ground layer vegetation map.	The methodology utilised for the survey of vegetation communities was in accordance with the standards provided in the (then) DEC Threatened Biodiversity Survey and Assessment Guidelines for Development and Activities (Working Draft) (DEC (NSW) 2004) and the BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECC 2009). This included assessment of ground layer vegetation types.
	1(g)	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.	Standardised habitat assessment plots were conducted at all locations that flora quadrats were conducted. Habitat assessments were undertaken in accordance with the methodology within the BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECC 2009). Habitat assessment plots were 50m x 20m in size and the following fauna habitat attributes were recorded within each plot: Canopy cover; Mid-storey cover;

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			<p>Ground cover;</p> <p>Number of tree hollows;</p> <p>Total length of fallen logs; and</p> <p>Any other significant fauna habitat features (e.g. rocky outcrops, large stand of feed trees, etc).</p> <p>These plots were then used to gain an understanding of the quality of fauna habitat within representative locations of the habitat types within the subject land.</p>
	1(h)	<p>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).</p>	As above.
	1(i)	<p>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.</p>	<p>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. The proposed development also provides 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.</p>

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			<p>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 LEP including:</p> <ul style="list-style-type: none"> 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. 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.
	1(j)	Losses of biodiversity must be offset in accordance with the DECC Principles for the use of biodiversity offsets in NSW.	The GHG BioBanking assessment includes a Comparison of the BioBanking assessment with the DECC (2008) Offsetting Principals and demonstrates that the proposed development footprint is consistent with these principles.
Hydrological Issues	1(k)	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.	<p>Additional monitoring was undertaken by Martens and Associates to supplement previous monitoring undertaken by Douglass and Partners (1994) and Coffey Geotechnics (2004 and 2007). The additional data is incorporated into an updated preliminary groundwater assessment study prepared by Martens & Associates Pty Ltd (November 2011) (refer to <i>Volume 3</i>).</p> <p>The Integrated Water Management Report prepared by Cardno (refer to <i>Volume 3</i>) identifies the current groundwater conditions at the site and identified potential impacts associated with the proposed development.</p>

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	1(f)	The beneficial use value of the groundwater beneath the site has not been properly recognised by the Proponent.	<p>This is addressed in the preliminary groundwater assessment study which has been prepared by Martens & Associates Pty Ltd (November 2011) . Martens, 2011 concluded that:</p> <ul style="list-style-type: none"> • groundwater quality is not to a standard to meet a 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, 2009); • the most significant beneficial uses for groundwater in some locations of the site are for irrigation and ecosystem maintenance (Coffey, 2007); • groundwater levels are likely to be drawdown by approximately 0.05 to 0.1 m over the adjacent SEPP14 wetlands due to reductions to recharge in the area of the site which would be balanced by approximately 10 years of sea level rise. Changes to groundwater flow direction at the site boundaries and within adjoining wetlands are negligible. • the proposed treatment train meets the stormwater quality objectives thereby protecting the quality of groundwater.
	1(m)	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.	<p>An Integrated Water Management Assessment (Cardno, 2011), including an assessment of impacts on groundwater is provided in <i>Volume 3</i>.</p> <p>An updated preliminary groundwater assessment study has been prepared by Martens & Associates Pty Ltd (November 2011) (refer to <i>Volume 3</i>).</p> <p>Protection of GDEs is achieved through appropriate management and monitoring programs proposed for the adjacent SEPP 14 wetlands. This will be achieved through the implementation of an integrated water management scheme (refer to <i>Volume 3</i>).</p>

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	1(n)	<p>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.</p> <p>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.</p>	<p>An updated preliminary groundwater assessment study has been prepared by Martens & Associates Pty Ltd (November 2011) (refer to <i>Volume 3</i>).</p> <p>The shallow wetlands and ponds that discharge into proposed freshwater lakes will be lined to ensure that TN and TP concentrations in stormwater discharged into freshwater (window) lakes not exceed limits identified by Martens & Associates, namely TN < 1.0 mg/L and TP < 0.2 mg/L. It should be noted that the water management proposal for the site has been completely redesigned and now minimises contact with the ground water table whilst increasing stormwater quality.</p>
	1(o)	<p>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.</p>	<p>An Integrated Water Management Assessment (Cardno, 2011), including an assessment of impacts on groundwater is provided in <i>Volume 3</i>.</p> <p>An updated preliminary groundwater assessment study has been prepared by Martens & Associates Pty Ltd (November 2011) (refer to <i>Volume 3</i>). See comment above.</p>
	1(p)	<p>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.</p>	<p>An updated preliminary groundwater assessment study has been prepared by Martens & Associates Pty Ltd (November 2011) (refer to <i>Volume 3</i>). See comment in 1(n).</p>

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	1(q)	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.	An Integrated Water Management Assessment (Cardno, 2011), including an assessment of impacts on surface and groundwater, climate change and flooding is provided in <i>Volume 3</i> . No expansion of the existing sailing water lake is proposed. All new water management features are separated from the existing lake by climate change compliant connections and outflows.
	1(r)	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.	An updated preliminary groundwater assessment study has been prepared by Martens & Associates Pty Ltd (November 2011) (refer to <i>Volume 3</i>). This covers the use of recycled effluent. It has been concluded that the use of recycled effluent on the site will not threaten groundwater quality or surface water quality in the various water management devices.
	1(s)	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.	See comment under 1(n).
Flooding	1(t)	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	In order to account for the possible impacts of climate change, modifications have had to be made to the previously proposed drainage regime in the Riverside Estate proposal. In order to maintain the existing approach, the most significant change has been to re profile the site, to ensure that the minimum invert of all new drainage structures in the proposed Riverside Estate 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

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Non compliance with groundwater legislation and policies	1(u)	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.	<p>been supported as an appropriate response.</p> <p>The other possible effect of climate change has been to increase flooding levels due to potential increases in tailwater and rainfall intensities. Revised flood levels across the site have then been accounted for in determining landform levels. A direct result of this raising of the drainage network is the re profiling of the surface levels across the site to provide cover to the pipes. Consequently the majority of the site is already raised above the revised flood levels. Additional lot filling is proposed in any remaining low-lying areas to ensure that all lots remain flood free above the modelled 100yr flood levels, with climate change. It should be noted that finished floor levels will be a minimum of a further 0.3m above this lot fill level (refer to <i>Volume 3</i>). Safe emergency egress during a flood is provided throughout the site.</p>
			<p>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. 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.</p> <p>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</p>

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Acid Sulphate Soils	1(v)	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 	<p>water meeting this water quality standard.</p> <p>An updated Integrated Water Management Assessment is provided in <i>Volume 3</i>.</p> <p>Coffey Geotechnics has prepared a revised ASS assessment report and revised Acid Sulphate Soil Management Plan (refer to <i>Volume 4</i>).</p> <p>Further assessment on the impact on groundwater is provided in the updated preliminary groundwater assessment study prepared by Martens & Associates Pty Ltd (December 2011) (refer to <i>Volume 3</i>).</p> <p>Furthermore, the Integrated Water Assessment Report (<i>Volume 3</i>) provides additional assessment and management of ASS.</p>

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		<p>required for establishment of the channel through the wetland;</p> <ul style="list-style-type: none"> • 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. 	
Aboriginal Heritage	1(w)	<p>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;</p>	<p>A resurvey of the study area was undertaken on the 18 February 2009. The results of the survey are documented in the updated Cultural Heritage Report (ERM, 2010) (refer to <i>Volume 5</i>).</p>
	1(x)	<p>The Proponent to 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.</p>	<p>KLALC has provided written confirmation of their commitment to monitor construction activities as detailed in the Cultural Heritage Report (ERM, 2010) (refer to <i>Volume 5</i>).</p>
Proposed expansion of commercial and retail centre	1(y)	<p>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</p>	<p>The proposed commercial area has been removed from the current proposal. This area has been issued a waiver by the NSW DoP from the Part 3A Concept Plan process. The area exists on a separate title and under an independent Community Scheme.</p>

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Community Title	1(z)	<p>considers it premature to recommend approval for the proposed retail/commercial centre expansion.</p> <p>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.</p>	<p>The Community Management Statement can only be amended by resolution of the Community Association. The proponent has made a commitment to seek to amend the Statement through consultation with the Community Association as may be recommended by the DP&I. This can be addressed within the Statement of Commitments.</p>
Sewage Treatment Capacity	1(aa)	<p>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.</p>	<p>The Proposal is accompanied by a IWCMP prepared in consultation with MidCoast Water and has the support of MidCoast Water.</p>