Riverside at Tea Gardens
Concept Plan and Project Application

Environmental Assessment Report
Volume 1

for Crighton Properties Pty Ltd

January 2009

0043707 - Final

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for Crighton Properties Pty Ltd

Principal Consultant:	*Steve O'Connor*
Date:	*January 2009*

Environmental Resources Management Australia Pty Ltd Quality System

January 2009

0043707 - Final

SUBMISSION OF ENVIRONMENTAL ASSESSMENT

prepared under Part 3A of the Environmental Planning and Assessment Act 1979

EA PREPARED BY

Names:	***Steve O'Connor***
Qualifications:	*BTP (Hons), MSc (Hons) and FPIA*
Address:	*53 Bonville Avenue* *THORNTON* *NSW 2322*

PROJECT PLAN APPLICATION

Applicant name:	*Crighton Properties*
Applicant address:	*PO Box 3369* *Tuggerah* *NSW 2359*
Land to be developed:	*Property description of land to be developed is contained in the EA.*
Proposed development:	*Concept approval is sought for a residential, tourist and commercial development at the Riverside site in Tea Gardens and project approval for the first stages of the development, including a residential subdivision, under Part 3A of the Environmental Planning and Assessment Act, 1979 (EP&A Act).*

ENVIRONMENTAL ASSESSMENT

☑ *An EA is attached which addresses all matters listed under Part 3A of the Environmental Planning and Assessment Act 1979.*

CERTIFICATE

I certify that I have prepared the contents of this EA and to the best of my knowledge:

- *it contains all available information that is relevant to the environmental assessment of the development to which the EA relates; and*
- *it is true in all material particulars and does not, by its presentation or omission of information, materially mislead.*

Signature:

Name:	*Steve O'Connor*
Date:	*30 January 2009*

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EXECUTIVE SUMMARY

Introduction and Proposal

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by Crighton Properties Pty Ltd (Crighton Properties) to prepare an environmental assessment (EA) of a Concept Plan for a residential, retail, commercial and tourist development at the Riverside site in Tea Gardens and Project Application for the first stages of the estate under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). This EA has been prepared in accordance with the Director-General's Environmental Assessment Requirements, issued on 16 September 2008. It describes the proposal, the environmental implications associated with the key issues of the proposed development and identifies subsequent management or mitigation measures. Architectural and Engineering Plans and Technical Reports, prepared as part of the Environmental Assessment are submitted as supporting documents in Volumes 2 and 3 respectively.

The Concept Plan for the Riverside at Tea Gardens site illustrates a residential / mixed use precinct over the majority of the site and a tourist and residential component located in the north eastern corner of the site. Crighton Properties is seeking concept approval for an extension of the existing town centre along Shoreline Drive, future residential development of the site that creates the potential for 1045 dwellings, tourist facilities (conference centre and accommodation) and residential lots (which are included in the 1045 dwellings) in the north east portion of the site.

The residential development of the site will include a variety of lots, access from Toonang Drive and Myall Street, an extension of the existing town centre on the north side of Shoreline Drive, an internal road network, water sensitive urban design (WSUD) measures including a two hectare extension of the existing detention and water quality management lake, creation of three new fresh water basins and extension of an existing lake – river connection channel, an open space network which provides for public recreation and a wildlife corridor, and community facilities. 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.

Project approval is sought for Stages 1, 2, 3, 4, 5, 6, 7, 8 and 9 of the mixed use retail, commercial and residential subdivision and relates to Lot 40 DP 270100, Lot 5 DP 270561, Pt Lot 1 DP 270561, Pt Lot 2 DP 270561, Lot 10 DP 270100, Lot 19 DP 270100, Lot 30 DP 270100 and Lot 1 DP 270100. The Project Application seeks to create residential lots as follows:

Size of Lots (square metres)	***Number of Lots***	***Number of Dwellings***
Multi dwelling lots	*26*	*61*
350 - 449	*17*	*17*
450 – 549	*70*	*72*
550 – 649	*160*	*152*
650 +	*75*	*79*
Total	*348**	*381*

* *Includes 108 home based business lots which are discussed below.*

The Project Application includes roadways and associated infrastructure associated with the future expansion of the existing town centre on the north side of Shoreline Drive. The Project Application also includes a two hectare extension of the existing brackish detention and water quality management lake, the inclusion of several new freshwater detention basins and ponds and the creation of a new channel connecting the detention lake to an existing channel which leads to the Myall River, to cater for the water quality treatment of drainage from the proposed development. Roadwork construction, open space for recreation and water quality management, and associated landscaping and infrastructure works are also proposed. A community clubhouse and associated tennis courts, active and passive open spaces, pool and BBQ facilities will also be developed. The subdivision would be created under Community Title, as part of the existing approved Community Title development.

Home based business lots are proposed to be located in two precincts and will create an environment that supports new businesses and provides a place where people can live, work and recreate. The two precincts will each have a technology / community meeting place that incorporates meeting rooms and facilities to be accessible to all residents of the home based business lots.

Voluntary Planning Agreement

A draft Voluntary Planning Agreement (VPA) has been prepared to provide appropriate contributions towards the need for infrastructure generated as a result of the proposed development. The VPA will span the life of the project and provide flexibility in the future should the development concepts change or demands for specific public infrastructure or services fluctuate.

Specific development contributions are provided either through monetary contributions paid to Council, land dedication, upgrading of road networks or other works in kind to provide public embellishments. The specific details of the contributions and the obligations of the signatory parties are outlined within the draft Voluntary Planning Agreement prepared jointly by Crighton Properties and Great Lakes Council and contained in Annex E.

The Site

The Riverside at Tea Gardens site ('the site') includes Lot 1 DP 270100, Lot 10 DP 270100, Lot 19 DP 270100, Lot 30 DP 27010, Lot 40 DP 270100, Lot 5 DP 270561, Pt Lot 1 DP 270561 and Pt Lot 2 DP 270561 and is approximately 229 hectares in area. It has approximately a one kilometre frontage to Myall Street and two kilometre frontage to the Myall River. An existing brackish detention lake within Lot 1 DP 270100 is proposed to be extended adjacent to the proposed town centre within Myall Quays. The existing detention lake is to function as part of the water treatment system for the site in conjunction with the proposed three (3) new freshwater detention ponds and basins and the extension of an existing channel connected to the Myall River.

State Environmental Planning Policy No. 14 – Coastal Wetlands (SEPP 14) applies to the wetland within a portion of the site adjacent to the Myall River. The SEPP 14 wetland will not be disturbed by the proposed development as it is proposed to

preserve these wetlands as part of the project. The majority of the site is available for urban purposes and zoned for mixed use urban development. The Shearwater Residential Estate lies to the north of the site and residential development of Tea Gardens is to the south.

The site is flat with generally sandy soils. The majority of the site was previously used for a pine plantation and has been substantially cleared of native vegetation. The majority of the Riverside at Tea Gardens site is zoned Residential 2(f) – Mixed Residential-Commercial. Part of the site adjacent to the Myall River is zoned Environmental Protection 7(a) Wetlands and Littoral Rainforest and 7(b) Conservation. The proposed development is permissible with consent.

Environmental Considerations

Environmental considerations have been identified within the Director General's requirements which relate to management of the land and water interface including protection of the coastal zone including land within 100m of the Myall River and the Port Stephens- Great Lakes Marine Park (protection of SEPP 14 Wetlands adjoining the Myall River have been highlighted). Water cycle management and impacts on the receiving waters and groundwater table from the proposed development require special consideration. Management of the development with respect to acid sulphate soils, bushfire protection and conservation of Aboriginal and European heritage are also identified. Special consideration is also to be given to the impacts associated with infrastructure provision, density of development, flora and fauna preservation and cumulative impacts. These environmental considerations are addressed within the EA and accompanying technical studies. Recommendations relate to management measures including monitoring to address these environmental considerations.

Coastal Protection

There is a SEPP 14 Wetland within the Riverside Concept Plan site. SEPP 14 Wetland No. 746 is located adjoining the Myall River within the eastern portion of the site. State Environmental Planning Policy 71 – Coastal Protection (SEPP 71) applies as the site is within the coastal zone. The parts of the site that are within 100 metres of the Myall River, the Port Stephens-Great Lakes Marine Park and within the SEPP 14 Wetland are defined as 'sensitive coastal locations' under SEPP 71. No development is proposed within the SEPP 14 Wetlands. The proposed extension of an existing channel connected to the Myall River so that it is connected to the existing lake, is limited to an area zoned 2(f) mixed commercial / residential and a small section of land zoned 7(a). No works or disturbance will be undertaken within the adjacent SEPP 14 Wetland. The extension of the channel is required in order to maintain the current hydrological regime of the existing extended detention lake post development. Thirteen residential lots and a community facility including a clubhouse and surrounding active and passive recreational areas forming part of Precinct 1 are located immediately adjacent to the 7(b) Conservation zone (wetland buffer). The proposed development therefore is located within a sensitive coastal location. The environmental impacts of development on the SEPP 14 Wetland have been addressed within this EA.

Water Cycle Management

Groundwater Levels

The groundwater table over the site ranges from 0.5 metres to 1.7 metres below ground level and tends to be shallower in proximity to the Myall River. Groundwater is currently used within Tea Gardens only for minor home irrigation (Coffey, 2007a).

Groundwater modelling indicates that groundwater levels within the site are not significantly affected by the proposed development. It indicated that the water sensitive urban design solution proposed for the site would cause localised drawdown toward the centre of the site by up to one metre. The affected area however is limited and the exceedance of criteria of ASSMAC is only minor for the predicted resulting groundwater levels. It is considered that the proposed extension of the lake would not adversely affect site groundwater outside the proposed lake extension (Coffey, 2007a). It also indicated that there would be negligible impacts to the SEPP 14 wetlands with only a marginal decrease in groundwater levels (less than 0.1 m drawdown) on the western edge of the wetland (Coffey, 2007a).

Groundwater Quality

Testing completed as part of current investigations has indicated that groundwater quality has not changed significantly since 2004. The results are generally below the key criteria for protection of species in marine water presented in the ANZECC guidelines, with the exception of some metal concentrations. The groundwater from the bores closer to the Myall River tends to be characterised by higher EC and a similar anion and cation ratio as seawater. When compared to the Australian Drinking Water Guidelines it is not potable due to concentrations of a range of analytes exceeding the drinking water guidelines.

Groundwater modelling indicated that the saltwater interface would not be significantly affected by the development.

Reuse of Reclaimed Water

Investigations have confirmed that the reclaimed water from treatment facilities in the area may be suitable for irrigation of open spaces and gardens within the development area subject to a small reduction in total nitrogen concentrations. This reduction could be achieved through a combination of treatment and dilution of the reclaimed water, with water of a higher quality (Coffey, 2007a). Ongoing discussions are occurring with MidCoast Water to explore this option further.

Appropriate monitoring of irrigated areas will ensure key indicators remain within the relevant guidelines. Monitoring would include the irrigation water and groundwater quality, application rates and timing of irrigation water and soil testing.

Water Quality Management

The catchment is located on the eastern side of Myall Street and extends from Myall River northwards to high ground near Viney Creek Road. The total area of the catchment is approximately 272 hectares. Surface water drains towards the existing lake and the SEPP 14 wetlands on the eastern boundary of the site. The impact of the existing development on flood flows was mitigated by constructing a detention lake to temporarily store floodwaters and to release it at a rate similar to predevelopment conditions. A number of small retarding basins have also been built within the existing development to meet retardation requirements, in addition to serving a water quality function.

A water quality management program was established in 1996. The primary aim for the existing management of water quality is to protect the SEPP 14 wetland by directing the runoff from the catchment to a tidally flushed lake within the Tea Gardens development directly to the south. This lake is also supported by a number of smaller ponds and wetlands located within the residential areas.

Seven (7) potential water management schemes were identified for consideration and assessed with respect to their strengths and weaknesses and impacts on the existing water quality of the Myall River catchment. An integrated water management plan was prepared which addressed the extension of the existing detention lake at Tea Gardens and the inclusion of several new freshwater detention basins and ponds designed to provide the water quality management system for the development (the proposed scheme).

Consideration of Climate Change

To mitigate the impacts of climate change, the Riverside at Tea Gardens development has adopted an additional freeboard of 0.3 m for minimum floor levels over and above Council's adopted minimum floor level of R.L.2.6 m AHD in areas subject to inundation from the Myall River to avoid over floor flooding in a 100 yr ARI event under all climate change scenarios. Elsewhere in Riverside the adoption of a minimum floor level of 0.5 m above the local 100 yr ARI flood level (under no climate change) would provide a minimum 0.22 m freeboard above the local 100 yr ARI flood level under a worst case of a high climate change scenario (0.91m sea level rise and 30 percent increased in rain fall intensity).

Under a high climate change scenario there would be increased inundation of a number of planned roads by up to 0.8 m (which would be still Low Hazard due to the expected very low velocity of flow on the fringes of the river flooding through the development) but this would comply with the requirements for safe wading. Even under a high climate change scenario, planned roads would provide flood free egress via a number of roads for residents evacuating from threatened properties to higher ground on the northern and north western boundaries of the development.

Wetland Management

The Great Lakes Local Environmental Plan 1996 (LEP) provides for the protection of wetlands on the site. The wetland covered by SEPP 14 is zoned '7(a) - Wetlands and Littoral Rainforest' and an adjacent broad band of freshwater wetland vegetation is covered by 'Zone 7(b) – Conservation' (Winning, 2009).

Developments adjacent to wetlands have the potential to indirectly affect the wetland communities in a number of ways including:

- *changes in quantity and quality of surface and groundwater flows into the wetlands;*
- *human pedestrian and vehicular intrusion;*
- *general 'edge effects', including:*
    - *predation of native fauna by domestic cats and dogs;*
    - *'light spill' of street lights which can affect the behaviour of native animals;*
    - *dumping of rubbish and garden refuse;*
    - *'weed creep' from lawn grasses, etc.; and*
    - *mowing of wetland margins (Winning, 2009).*

To address the potential impacts to the SEPP 14 Wetland, an Integrated Water Management Strategy has been developed to manage the groundwater and surface water flows. The management of the groundwater and surface water flows should mitigate any impacts on the wetlands resulting from the potential pollutants identified. In addition, the Ecological Site Management Strategy identifies controls and mitigation measures to be implemented to protect adjacent wetland areas. The works associated with the extension of the existing drainage channel will result in no loss of SEPP 14 wetland vegetation.

Canal Estate Development

Legal advice from Malcolm G. Craig, Q.C. regarding the applicability of SEPP 50 to the proposed detention basis, indicates that the proposed extension of the existing detention lake would not represent a canal estate development within the meaning of clause 3 of SEPP 50, provided the area of any basins and the lake is the minimum required for stormwater detention and treatment.

Land / Water Interface

Land / Water Interface (residential)

The Concept Plan and Project Application maintain the wetland and wetland buffer. The proposed extension of an existing channel connected to the Myall River will largely occur within 2(f) zoned lands, with a small component within 7(a) zoned land. No works will be undertaken within the SEPP 14 Wetland. Groundwater and surface

water flows from the channel entering the wetland via the existing drainage channel will be managed in accordance with the Integrated Water Management Strategy, to ensure that any impacts on the wetland resulting from potential pollutants are mitigated. A 21 hectare buffer (zoned 7(b) Conservation) will separate the residential area from the wetlands. Land within the 7(b) zoned buffer lands will also be retained in an undeveloped state with the exception of the creation of a foreshore park and a small extension of the existing channel.

Land / Water Interface (Extension of the Existing Drainage Channel)

An existing drainage channel which is connected to the Myall River is proposed to be extended. A three metre wide channel with maximum depth of 0.7m will be created to connect to an existing drainage channel. The total area of excavation is approximately 150m^2 and the total volume of material to be excavated is approximately 60m^3. This will involve the direct loss of approximately 150m^2 of Melaleuca ericifolia scrub (3b) with small patches (unmapped) of Juncus kraussii. This vegetation loss will occur largely on land zoned 2(f) but some vegetation will be removed from 7(a) zoned land. No clearing willoccur within the SEPP 14 Wetland. The resultant shallow water channel would provide alternative wetland habitat (Winning, 2009).Works are anticipated to take approximately two days to complete, followed by subsequent rehabilitation activities and ongoing monitoring to be detailed in the Wetland Management Plan to be developed for the works.

Erosion control methods are to be installed and maintained prior to, during and following excavation activities in order to minimise the impact of sedimentation on the SEPP 14 wetland, adjacent environs and the Myall River. Prior to the commencement of channel extension works, the pH level of the soil will be tested to determine whether acid sulphate soils are present. Should they be present, the mitigation measures detailed in the Acid Sulphate Soil Management Plan will be implemented. The channel is required to be extended in order to maintain the current hydrological regime of the existing lake by a corresponding variation of the rate of flow of water in and out of the lake.

Fishing and Aquaculture

Several studies have been undertaken to gauge the health and diversity of the fish community of the existing artificial lake. These studies include a survey which was undertaken in April 2007. Survey results from 2007 indicate that the number of fish species and individual fish have increased from previous studies. Previous recommendations include increasing the amount and quality of aquatic habitats with respect to increasing the extent, complexity and quality of near-shore habitats for fish, invertebrates and birds. Recommendations for optimising the quality of aquatic habitats incorporate the current proposal to extend the existing detention lake. This will add diversity and provide increased habitat within the lake system.

The planned extension of the lake would increase tidal ventilation and reduce water-quality variability as well as improving the availability of habitats and food for aquatic and water-associated plants and animals. The proposed development at Riverside will continue to contribute to environmental assets of the Tea Gardens area by providing for the extension of marine habitats and supporting the existing aquaculture.

Soils and Contamination

According to the Acid Sulphate Soils Risk Map for Port Stephens the site is located in an area where there is a low probability of acid sulphate soil materials occurring between one metre and three metres below the ground surface. The map indicates that acid sulphate soil (ASS) materials, if present, are sporadic and may be buried by alluvium or windblown sediments. As a result 105 samples across the site were collected and screened for ASS.

Results from laboratory testing indicated that 19 of the 28 samples analysed for SPOCAS / SCR exceeded the Acid Sulphate Soil Management Advisory Committee action criteria. An Acid Sulphate Soils Management Plan has, therefore, been prepared that relates to future earthworks at Riverside. The plan provides information for all lot purchasers and contractors required to work on the site.

A Phase 1 Environmental Site Assessment was undertaken to identify potentially contaminating activities that have previously, or may currently be occurring on the Riverside at Tea Gardens site. The assessment identified that pesticide use occurred in pine plantations, which is an identified past landuse occurring on the site. However, use of pesticides is usually confined to the first two years of a plantation crop cycle and all chemical pesticides used in commercial pine plantations in Australia are also used in general agriculture. Therefore the potential impact to the site from the use of pesticides associated with the former pine plantation is considered to be minor.

Potential for existing site contamination is considered to be low and if encountered, contamination is likely to be limited in extent to localised zones within the site. Therefore the site is considered to have low potential to adversely affect human health or the environment either on surrounding properties or local receiving waters. The Phase 1 ESA undertaken for the Riverside at Tea Gardens site did not identify any significant potential for site contamination. The site is therefore considered suitable for the proposed development.

Soil excavated through the construction of the subdivision, including the water detention lake, basins and ponds, and the extension of an existing channel will be reused on site, with excess topsoil to be stockpiled for future reuse at the proposed sporting complex on the eastern side of Myall Street which will be dedicated to Great Lakes Council as part of the Voluntary Planning Agreement.

Aboriginal Heritage

An Aboriginal Heritage Assessment has been undertaken to identify whether there are any Aboriginal heritage constraints to the proposed development. The assessment involved a review of the environmental, historical and archaeological context of the Riverside at Tea Gardens site, consultation with the Aboriginal community and field investigations of the survey area in conjunction with members of the Aboriginal community.

Two archaeological sites have previously been identified in the locality during investigations carried out by Dallas (1982) and Brayshaw McDonald Pty Ltd (1988). Additional field investigations undertaken in May 2008 as part of the Aboriginal heritage assessment identified a midden site adjacent to the SEPP 14 Wetland buffer.

This site is considered to be a new midden site. The site identified by Dallas (1982) has been previously removed with consent when residential development took place several years ago.

The midden site identified by Brayshaw McDonald Pty Ltd (1988) was not relocated during the current survey due to access limitations and very low visibility associated with the inundation of the SEPP 14 wetland and surrounds. However this site, which was previously recorded within the SEPP 14 wetland, will not be impacted by the proposed development. The adjacent 7(b) Conservation lands provides additional buffer to the SEPP 14 Wetland. Whilst the exact location and context of this site was not reconfirmed within the current survey, the large buffer area provided by the SEPP 14 Wetland and adjacent wetland buffer will ensure that it is not directly impacted.

The newly recorded midden (Riverside_01) is located within the proposed tourist precinct and the Concept Plan has been amended to ensure that it is protected by a minimum 10 metre buffer on all sides.

Neither the newly identified midden nor that previously recorded by Brayshow McDonald (1988) will be directly impacted by the proposed development, however ancillary or indirect impacts cannot be discounted. Alterations to drainage patterns could accelerate erosion of the deposits and greater visitation (on foot and vehicular) may cause damage or erosion. To ensure that indirect impacts do not damage the middens (in particular the recently identified midden located within the proposed tourist precinct), ('Riverside_01'), the following recommendations will be implemented on site:

- *Riverside_01 should be protected on all sides by a minimum 10 metre buffer. No construction/excavation works, including the storage of machinery should impinge on this buffer zone;*

- *a management plan should be developed in consultation with the local Aboriginal community to ensure the long-term protection of the middens. This management plan should consider the use of fencing, designated walkways and interpretive signage at Riverside_01 as an educational resource. No development or excavation works should be undertaken within the tourist precinct until this management plan has been finalised and approved by the Karuah LALC and DECC;*

- *based on the location of site 38-05-0148 within the protected SEPP 14 Wetland and associated buffer zones, no further protection measures are required;*

- *based on the predictive modelling and confirmed by field survey it is likely that a consistent low-density scatter of midden material is likely to occur within the eastern portion of the study area. This area will be protected within the SEPP 14 Wetland and associated buffer zones and no specific management measures or monitoring is recommended;*

- *the remainder of the study area has limited potential for additional sites to be recorded and no specific management measures or monitoring is recommended from an archaeological perspective. Following consultation with the local Aboriginal community, monitoring of clearing and initial excavation works has*

been recommended by the Karuah LALC. This would not be undertaken as an archaeological activity; and

- *a suitable area should be set aside for the possible containment of any cultural heritage material that is uncovered during the construction works. This dedicated 'keeping place' would only be required in the event that material is uncovered and would be under the care and control of the local Aboriginal community.*

Bush Fire

Part of the site is mapped as bush fire prone land in the Great Lakes Council bush fire prone land mapping. The potential bush fire threat was identified from dry sclerophyll forest vegetation to the north west, north east and south east directions. A reduced risk was considered present from the west, south west and south as a result of cleared grass land, scattered trees, industrial land use and existing residential development. The proposal incorporates a range of bush fire mitigation measures, including Asset Protection Zones, building construction, hazard management, evacuation routes, and availability to fire fighting services, water supply and communication.

Flora and Fauna

Detailed flora surveys have been undertaken within the Riverside at Tea Gardens site, or portions of it, over the period 1988 to 2008. Fauna surveys were completed within the site in 2002 (October and September), 2004 (February, March and August), 2005 (August and September), 2007 (March, July, August and September) and 2008 (January, February, March and April) (Conacher Environmental Group, 2008b).

Flora

The majority of the site's vegetation forms a mosaic of highly disturbed grasslands with scattered trees and woodland/open forest communities. However, the eastern portion of the site is dominated by a large remnant of naturally vegetated Swamp Forests, Heaths and Estuarine vegetation communities associated with the low lying areas adjoining the Myall River. This remnant is largely isolated from adjoining vegetation to the south by existing residential development and to the north by an area of cleared agricultural land.

No endangered flora populations or threatened flora species as listed in the TSC Act 1995 have been identified in the local area. Three endangered ecological communities, being Coastal Saltmarsh, Swamp Sclerophyll Forest on Coastal Floodplains and Swamp Oak Floodplain Forest have been identified within the site (Conacher Environmental Group, 2008b).

Fauna

A range of fauna habitats are present within the site reflecting the diversity in the vegetation communities present. The majority of the site is, however, of decreased habitat quality due to the large amount of disturbance through removal and modification of the groundcover and shrub layer through grazing and slashing. The

lack of cover however does increase foraging opportunities for raptorial and other bird species. The open grassed areas contain suitable habitat for macropod species, particularly the Eastern Grey Kangaroo and Red-necked Wallaby.

Areas of the site are prone to ponding after rain, providing suitable habitat for a range of amphibian species. The drainage depressions associated with tracks and tree removal holes contain suitable foraging and breeding habitat for these locally occurring amphibian species.

The denser, less disturbed vegetation types associated with the Myall River (Swamp Forest, Closed Heathland, Low Closed Forest/Open Scrub, Closed Sedgeland, Closed Rushland) provide higher quality habitat due to the increased density and diversity of the various structural layers. These less disturbed habitats provide increased foraging, refuge and breeding opportunities for mammal, bird, reptile and amphibian species. This is reflected in the species richness of these vegetation types in comparison to the majority of the site containing the disturbed vegetation communities. These higher quality vegetation and habitat types will be largely retained as part of the proposed development (Conacher Environmental Group, 2008b).

Threatened Species

There are two Endangered Populations listed on Schedule 1, Part 2 of the Threatened Species Conservation Act (1995) that occur in the local area. These are the Hawks Nest and Tea Gardens Endangered Koala (Phascolarctos cinereus) Population and the Emu population in the NSW North Coast Bioregion and Port Stephens Local Government Area (Conacher Environmental Group, 2008b).

There are no records of Emus on the Atlas of NSW Wildlife (DEC 2007). It is considered that the site contains sub-optimal habitat for the endangered population of Emus. This species was not observed on site or in adjacent areas. Habitat requirements and food tree species that characterise habitat for the Hawks Nest and Tea Gardens population of the Koala were located on the site and adjacent lands. No sightings during surveys or evidence of koala usage such as scats, scratches or sightings were made on the site (Conacher Environmental Group, 2008b).

Seven threatened fauna species were observed within the site during surveys conducted within the last five years.

Management

The proposed development will require approximately 126 hectares of vegetation to be removed or modified, however much of this consists of disturbed/cleared land. The concept plan proposes the retention, protection and management of approximately 78 hectares of higher quality vegetation and habitat types including the vast majority of the endangered ecological community Coastal Saltmarsh and areas within the SEPP 14 wetland (Conacher Environmental Group, 2008b). A further 20 hectares of vegetation will be improved or maintained. An Ecological Site Management Strategy has been developed to manage habitat fragmentation, and preservation of habitat corridors throughout the site (Conacher Environmental Group, 2008d).

Infrastructure

In preparing a strategy for servicing the development, investigations of the capacity of existing infrastructure to accommodate the proposal were completed.

Water

Reticulated water supplies are available to the existing development area south of the site and MidCoast Water has completed the upgrade and augmentation of potable water storages at the Viney Creek Road Reservoirs. In addition, MidCoast Water also has a secure coastal bore water supply that has a known water supply capacity which exceeds the requirements of the potential developments at Riverside, Myall River Downs Estate, North Shearwater and Hawks Nest North. The proposed water supply servicing strategy includes a reorganisation of major water supply services from existing dual supplies in Myall Street to a triple supply via North Shearwater. Investigations are being conducted by Tattersall Surveyors in consultation with MidCoast Water, on the potential for the reticulation of treated effluent via a third pipe to all new residences within Riverside and areas to the north and west.

Sewer

A reticulated gravity sewer system already serves an area south of the site. MidCoast Water has recently constructed a 'state of the art' vacuum sewer pumping station, which is sited adjacent to the Myall River Downs Estate, west of Myall Street. It has been sized to provide services for the lots in the Riverside development.

Electrical and Communications

The proposed electrical and communication services will extend from existing services. Crighton Properties has provided Country Energy with the proposed subdivision layout so that they can commence designing for major new links for the existing overhead supplies.

Amenity and Scale

The desired future character under the NSW Coastal Design Guidelines (2003) includes interconnectedness of residential areas, an ability to provide total water cycle management, a design that provides wildlife corridors and avoids areas of ecological significance and preserves and protects waterways as significant coastal locations. The desired future character is achieved within the Riverside development through the extension of the existing detention lake, the inclusion of three (3) separate freshwater detention ponds and extension of an existing drainage channel connected to the Myall River to provide total water cycle management and an attractive visual landscape within the open space networks which also function as wildlife corridors. The site adjoins a SEPP 14 Wetland which will be preserved as part of this development proposal.

Urban Design

The major urban design principles include walkable neighbourhoods, connected communities, a mix of building types and uses, design of quality open space, and the use of civic buildings as local point and destinations. These urban design principles have been achieved in the following ways:

- *a reduction in the size of neighbourhoods to smaller communities to allow walkability to community facilities and public transport nodes;*

- *design of road networks to provide alternative routes to destinations which include connected pedestrian pathways and separation between vehicles and pedestrian movement to encourage walkability;*

- *provide a mix of uses within a community to provide for passive surveillance within a community to increase safety and security whist moving through the neighbourhood;*

- *by providing a full range of housing types and work places, age and economic classes are integrated and the bonds of an authentic community are formed;*

- *open space is provided in the form of specialised corridors, reserves, playgrounds and parks . Each type is defined by its size; the landscaping used, if any; and the way the space is surrounded; and*

- *civic buildings, such as meeting rooms, churches and community centres are located within open spaces or at the termination of important vistas. Such structures promote democratic initiatives and the balanced evolution of society is facilitated (Roberts Day, 2007).*

Site Permeability

The Myall River Downs and Riverside site is split down the middle by Myall Street which is the major entry to the township of Tea Gardens. In its current state it does not provide a memorable arrival experience. The proposed Master Plan for Riverside and Myall River Downs represents the realisation of this challenge. The plan is structured on three main elements: Nature Preserve, Neighbourhoods and Corridors (Roberts Day, 2007). The context of the Tea Gardens area requires an assessment of the access and servicing over both the Riverside and Myall River Downs site as both sites will need to demonstrate links between the employment, industrial and retail areas which will be developed on both sites to service the area. The Urban Design Report prepared by Roberts Day outlines the Urban Design Forum undertaken with the local community in February 2006 which identified the urban design principles which have influenced the design of the Riverside development.

Traffic and Access

Vehicle Movement and Intersection Capability

Vehicle access for the project application will be from Shoreline Drive via the existing intersection at Myall Street. In the concept plan access will also be provided from a

new access point along Myall Street and two access points from Toonang Drive as part of the future development of Riverside.

Traffic Generation and Movement

Existing traffic flows at the intersection of Myall Street and Shoreline Drive are low. A traffic survey indicated that during the morning peak period the two way traffic flow along Myall Street (west of Shoreline Drive) was in the order of 362 vehicles, with vehicles predominantly going to the west (193 vehicles). The results from the afternoon survey show a peak flow of 421 vehicles with movement predominantly to the east (250 vehicles).

The traffic flows along Shoreline Drive are significantly less with 135 vehicles recorded during the morning survey and 256 vehicles recorded in the afternoon. Based on the RTA Guide to Traffic Generating Developments Myall Street has the capacity to accommodate 1,400 vehicles per hour in one direction. When comparing this capacity with the existing traffic flows it is evident that Myall Street has capacity to absorb additional traffic.

Reducing the RTA Guide to Traffic Generating Development rates by around 35 percent is appropriate to reflect the profile of this development. This gives an external trip generation rate of 0.55 trips per dwelling during peak periods. The daily rate can also be reduced. Based on these rates the project application would generate approximately 215 vehicles per hour two-way. The concept plan (that is full development) would generate 575 vehicle movements per hour.

Intersection Operations

The Myall Street and Shoreline Drive intersection provides a give way control with a central right turn lane, so that west bound traffic is not impeded by traffic turning right, and a deceleration lane for traffic turning left form Myall Street.

An assessment of the operation of this intersection using the Sidra computer program indicated that the existing priority controlled intersection will continue to provide a high level of control for all road users over a ten year design period for the project application. The approach capacity on Myall Street is also satisfactory as a two lane configuration, and does not required upgrading to cater for the project application.

With the development of Myall River Downs on the west side of Myall Street, the existing intersection will need to be upgraded to a roundabout control to allow for a four way intersection. A second intersection will be constructed to the north of the existing intersection, as part of the concept plan. It will be a priority controlled intersection similar to the intersection of Shoreline Drive and Myall Street. It will eventually need to be upgraded to a roundabout control, which is triggered by the development of Myall River Downs or the industrial land west of Myall Street.

Urban Design

The Riverside development incorporates a number of transport objectives that relate to pedestrian, vehicle and cycle movement, public transport and parking.

Public Transport and Pedestrian and Cycle Access

Riverside is currently served by buses along Myall Street. The proposed Riverside development will increase the population of Tea Gardens, contributing to greater potential patronage levels to sustain a viable bus service.

Walkability and cycle access has been integrated in the development of the site, with a shared cycle / pedestrian network through the residential subdivision and the existing commercial centre and the wider area.

Social and Economic Implications

Population Change

At the time of the 2006 Census the total population of Tea Gardens was 2,094 people. Between 1991 and the 2001 Census the population of Tea Gardens doubled from 684 people to 1,372, an average growth of 7.5 percent annually. Between 2001 and 2006 the population of Tea Gardens rose from 1,372 people to 2,094, an average growth of eight percent annually. Between 1991 and 2006, the Tea Gardens population grew by 206 percent.

Riverside is expected to add over 2,000 people to the population of Tea Gardens with the addition of 1,045 new dwellings.

Community Facilities

Riverside is well served by education and medical facilities and has access to public transport and employment areas. The development offers the opportunity to significantly enhance the services and community facilities in Tea Gardens, and build on the enhancement of services already delivered by the existing Riverside commercial centre. To ensure that the community benefits from the development, Crighton Properties commits to:

- *ensuring the internal roads in Riverside will be sufficient to accommodate a bus route generally within walking distance of each dwelling (that is 400 metres);*
- *providing a comprehensive cycle network that connects all community facilities, the commercial centre and directly to Council planned cycle path network;*
- *contributing to the provision of a multipurpose community function / meeting facility;*
- *keeping the principals of both Tea Gardens Public School and Bulahdelah Central School informed of the growth of the school age population in Riverside. Crighton Properties will also discuss opportunities for courses run by TAFE and University of Newcastle to be conducted in the community facilities proposed as part of Riverside;*

- *providing meeting rooms and telecommunications as part of the home business precincts;*

- *consolidating sporting and recreational facilities on the North Western side of the Myall Road site, as part of the Myall River Downs development;*

- *providing opportunities for the expansionof the existing commercial centre (roadways and associated infrastructure are part of the Project Application); and*

- *providing the approved Concept Plan to the Population Health Unit of the Hunter New England Health Service, to assist them in the planning for preventative health.*

Housing

The 2006 Census data indicates that housing in Tea Gardens is dominated by detached dwellings (92 percent). Since 2001 there has been a housing boom, which increased the number of townhouse and unit developments in the town. There is sufficient aged care and retirement living services in the adjoining Myall River Downs development to accommodate the anticipated population growth in Tea Gardens.

At Riverside six approaches will be implemented to encourage the provision of affordable housing, namely:

- *the inclusion of at least ten percent of lots less than 450 square metres, to provide housing options (substantially through the provision of duplexes);*

- *encouraging shared use dwellings incorporating home office facilities to create affordable lifestyle opportunities;*

- *to allow for alternative dwelling types, such as 'dual key' dwellings where areas of a dwelling can be rented out as self contained units;*

- *allowing for an adequate supply of housing in the concept plan;*

- *providing a subdivision design that maximises opportunities for an affordable lifestyle through the use of non motorised transport modes, accessibility of services and facilities and energy and water efficiency; and*

- *encouraging a rental market.*

Economy and Employment

Riverside will contribute to attracting more jobs and working people to Tea Gardens, through the provision of home business lots. The incorporation of these lots offer strong social benefits in terms of allowing people the opportunity to avoid the need to commute long distances, reduced dependence on child care services and prevent the social dislocation that is associated with long distance commuting (Duo, 2007). In addition, the development of Riverside will have a positive effect on employment and

the economy in terms of employment during construction, residential consumption activities and the day to day operation of the site and ongoing maintenance programs.

Retail/ Commercial Demand

The Wakefield Planning Tea Gardens Retail Study – Update of IBECON's 2000 Study (Wakefield, 2007) provided an update using population projection figures produced by the Planning Workshop Australia in 2005, the most recent census information and various Council studies and reports.

There is a high demand for the proposed commercial/retail development of the Riverside site, and it would be able to provide for the Tea Gardens and Hawk Nest area well beyond the year 2016.

Retail Hierarchy

Tea Gardens/Hawks Nest is a relatively isolated area. Raymond Terrace provides the closest level of hierarchy in terms of shopping, followed by numerous opportunities in the Newcastle region.

Based on floorspace and associated changes, Raymond Terrace is the only relevant shopping centre in relation to Tea Gardens/Hawks Nest. Raymond Terrace is 52 km by road from Tea Gardens. It is therefore appropriate to provide retail capacity in Tea Gardens/Hawks Nest at a higher level than might otherwise be expected, given its population.

Community Title

The Community Management Statement for Myall Quays does and will continue to apply to the community land within Riverside at Tea Gardens. All footpaths, cycleways, open space areas, parks and water treatment facilities outside of road reserves will be owned by the Community Association. The commercial precinct will operate under separate Community Title. The benefits of community title are:

- *the ongoing maintenance of the site, including areas of open space, will be undertaken at no cost to rate payers, despite the areas being publicly accessible;*
- *the Community Management Statement regulates development within the community lands, thereby restricting unwanted development and ensuring consistency in the use, maintenance and development of community land;*
- *provision of a collective single entity empowered and effectively ensured to liaise with land and water management groups; and*
- *ability to fund and effectively implement commitments and conditions of consent.*

Conclusions

The Mid North Coast is recognised in the draft 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.

The proposal provides a variety of dwelling types, which would appeal to a range of household types, thereby contributing to a more diverse housing pattern to support the dynamic social character within Tea Gardens. The proposal represents the ongoing development of a site which has already provided over 260 homes / lots in the growth of the region.

The local community will also benefit significantly from the proposed development with an estimated $256 million supporting 1,557 local jobs across all sectors, spread across the anticipated 10 year life of the project. This support will facilitate the anticipated growth of the Mid North Coast and provide a holistic response to growth within the Tea Gardens/ Hawks Nest area.

Comprehensive planning has been undertaken to create an attractive environment for future residents. An assessment of the natural constraints of the site, urban capability, availability of public services, access to employment, commercial and community facilities and the provision in choice of housing and location were all taken into consideration when planning Riverside. These considerations are discussed in detail throughout this Environmental Assessment Report and supported by technical studies and surveys contained within Volume 3.

1 INTRODUCTION

This chapter describes the project, including the site and surrounds and includes background information about the site and project.

Crighton Properties Pty Ltd (Crighton Properties) seeks Concept Plan approval for a residential, retail, tourist and commercial development at the Riverside site in Tea Gardens and approval of a Project Application for the initial stages of the development, including a residential subdivision, under Part 3A of the *Environmental Planning and Assessment Act, 1979 (*EP&A Act).

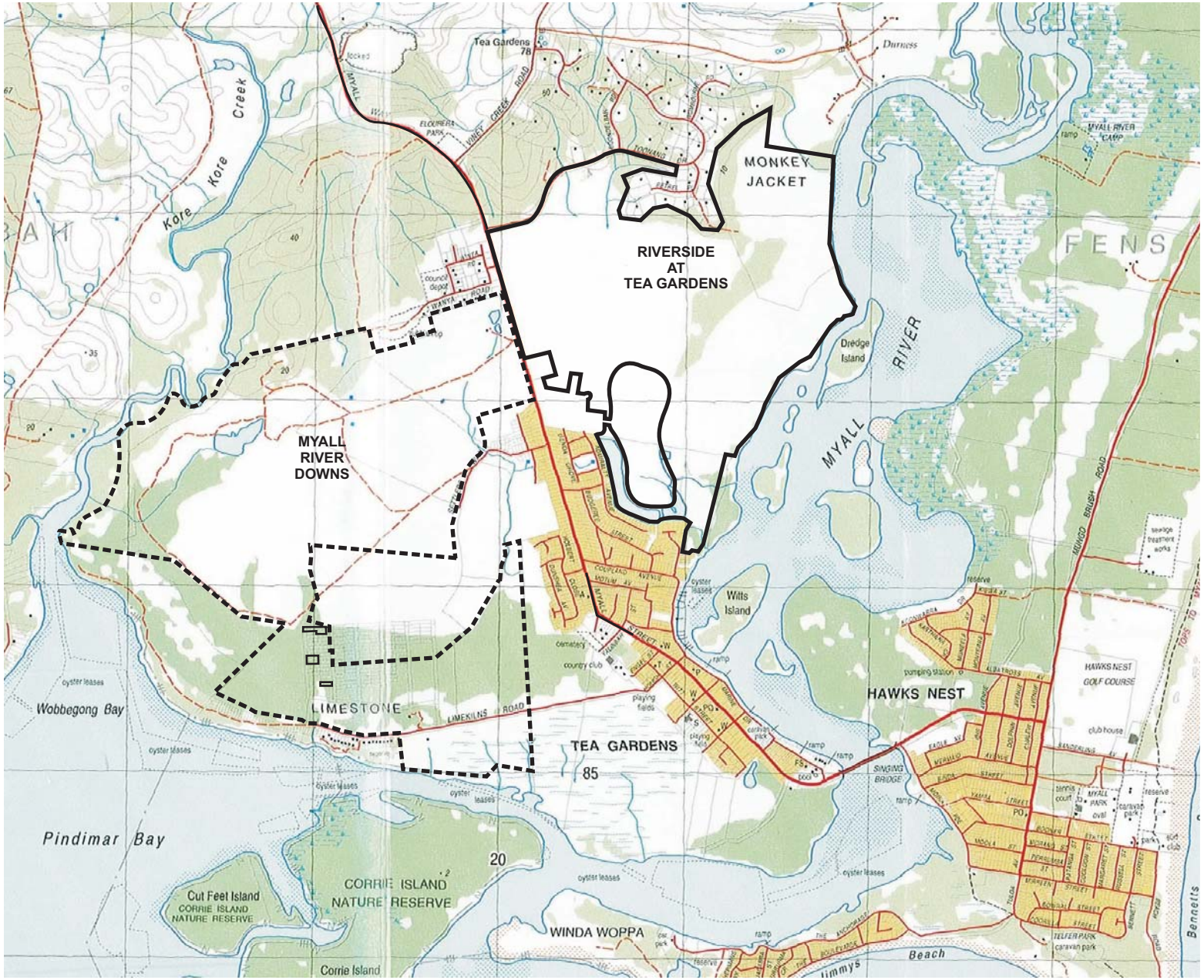
Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by Crighton Properties to prepare an environmental assessment (EA) of a Concept Plan for a residential, retail, tourist and commercial development and Project Application for the initial stages of the development. This EA has been prepared in accordance with the Director-General's Environmental Assessment Requirements, issued on 16 September 2008. It describes the proposal, the environmental implications associated with the proposed development and identifies subsequent management and mitigation measures.

1.1 BACKGROUND

Crighton Properties, or its affiliated companies and associates, are the owner of three substantial development sites at Tea Gardens on the Mid North Coast of NSW. A locality plan is provided in *Figure 1.1*. In 1991 Crighton Properties bought the site currently known as 'Riverside' at Tea Gardens (formerly 'Myall Quays') which lies immediately to the west of the Myall River and to the east of Myall Street (the main road linking Tea Gardens / Hawks Nest with the Pacific Highway). This site has subsequently been subdivided and comprises two large lots. The third development site owned by Myall River Downs Pty Ltd (part of the Crighton Groups) is known as the 'Myall River Downs' site and comprises approximately 320 hectares of land located to the west of the Riverside site and on the western side of Myall Street. The location of these three sites is shown in *Figure 1.1.*

The Myall River Downs Estate has the potential for the creation of approximately 1500 dwellings. A Concept Masterplan has been prepared illustrating how the development of both the Myall River Downs and Riverside at Tea Gardens sites would occur. The Concept Masterplan was based on the findings of environmental studies and design forums held with members of the community, Councillors and Council officers. The concept Masterplan is provided in *Annex A*.

The Myall River Downs site is not part of this Concept Plan and Project Application.



Legend

Riverside at Tea Gardens
Site Boundary

Figure 1.1

Locality Plan

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_aug_01		
Date:	21/08/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	1:25,000 Topo Series Port Stephens Sheet		
Scale:	Refer to Scale Bar		

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This EA relates to the Riverside at Tea Gardens site. Crighton Properties lodged a rezoning request with Great Lakes Council for a multi-stage residential/resort development on the site. The Council first resolved to prepare a draft Local Environmental Plan (LEP) for the site in 1989 subject to the findings of a formal LES. The LES was prepared in 1991 and the site was finally rezoned to *2*(f) Mixed Residential - Commercial in 2000.

In 2002 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. Following the introduction of *State Environmental Planning Policy No 71 – Coastal Protection* (SEPP 71) in November 2002, a master plan was required to be adopted by the Minister for Planning before any further residential subdivisions could be approved.

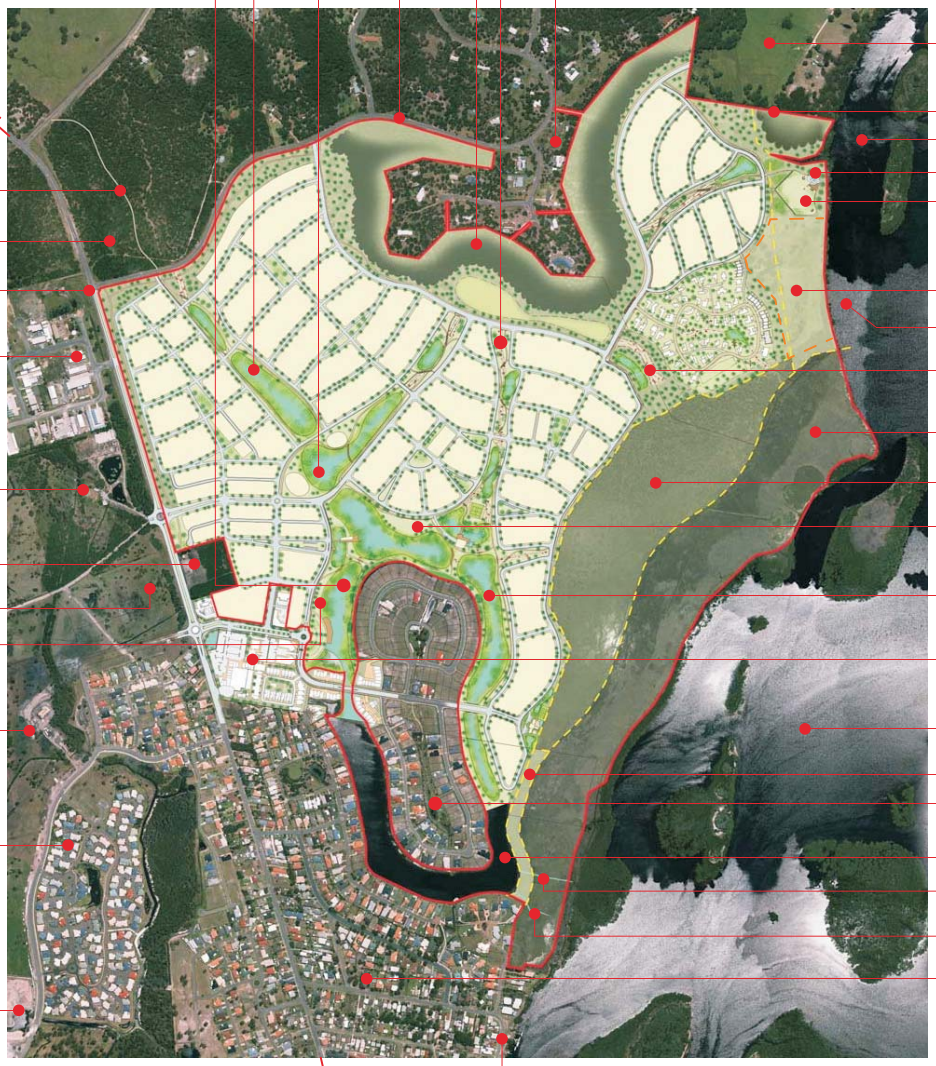
A Planning Focus Meeting was held on site on 28 December 2003 to discuss the master plan and the various development proposals. The Director-General's requirements for an EIS were subsequently issued by the Department of Infrastructure, Planning and Natural Resources in January 2004 (Ref: N91/00721) for the artificial water detention body and the residential/tourist/recreational components of the development. The Department also provided requirements regarding the preparation of a master plan for the development under SEPP 71 (Ref: S03/03010). Since the issue of the Director-General's requirements, the EP&A Act has been amended to include Part 3A Major Projects provisions. Refer to *Section 3.3.1* for further discussion on these provisions.

1.2 SITE DESCRIPTION

The Riverside at Tea Gardens site ('the site') incorporates Lot 10 DP 270100, Lot 19 DP 270100, Lot 30 DP 270100, Lot 1 DP 270100, Lot 40 DP270100, Lot 5 DP 270561, Pt Lot 1 DP 270561 and Pt Lot 2 DP 270561, and is approximately 229 hectares in area.

Lot 40 DP 270100, Lot 5 DP 270561, Pt Lot 1 DP 270561 and Pt Lot 2 DP 270561 were created from Lot 38 DP 270100. Lot 38 was subdivided into the four lots, one within the current residential community association (Lot 40) and three within the newly created commercial community association (Lot 5, Pt Lot 1 and Pt Lot 2). The purpose of the creation of the alternative community title arrangements was to facilitate effective administration of the lots and reduce potential for conflict and competing priorities of the community and commercial precincts.

The proposal includes Lot 1 DP 270100 which supports a brackish detention lake which is proposed to be extended adjacent to the proposed town centre within Myall Quays. The two hectare extension of the existing detention lake within the Riverside development is to function as part of the water treatment systems for the site in conjunction with the proposed three (3) new freshwater detention ponds and basins.



Legend

Riverside at Tea Gardens Site Boundary

Distance to:	
Pacif c Hwy	12 km
Karuah	24 km
Bulahdelah	39 km
Raymond Terrace	51 km
Newcastle	76 km
Sydney	215 km

Figure 1.2

Context Plan for Riverside at Tea Gardens

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_jan_02		
Date:	23/01/09	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties Context Plan RC .01		
Scale:	Refer to Scale Bar		

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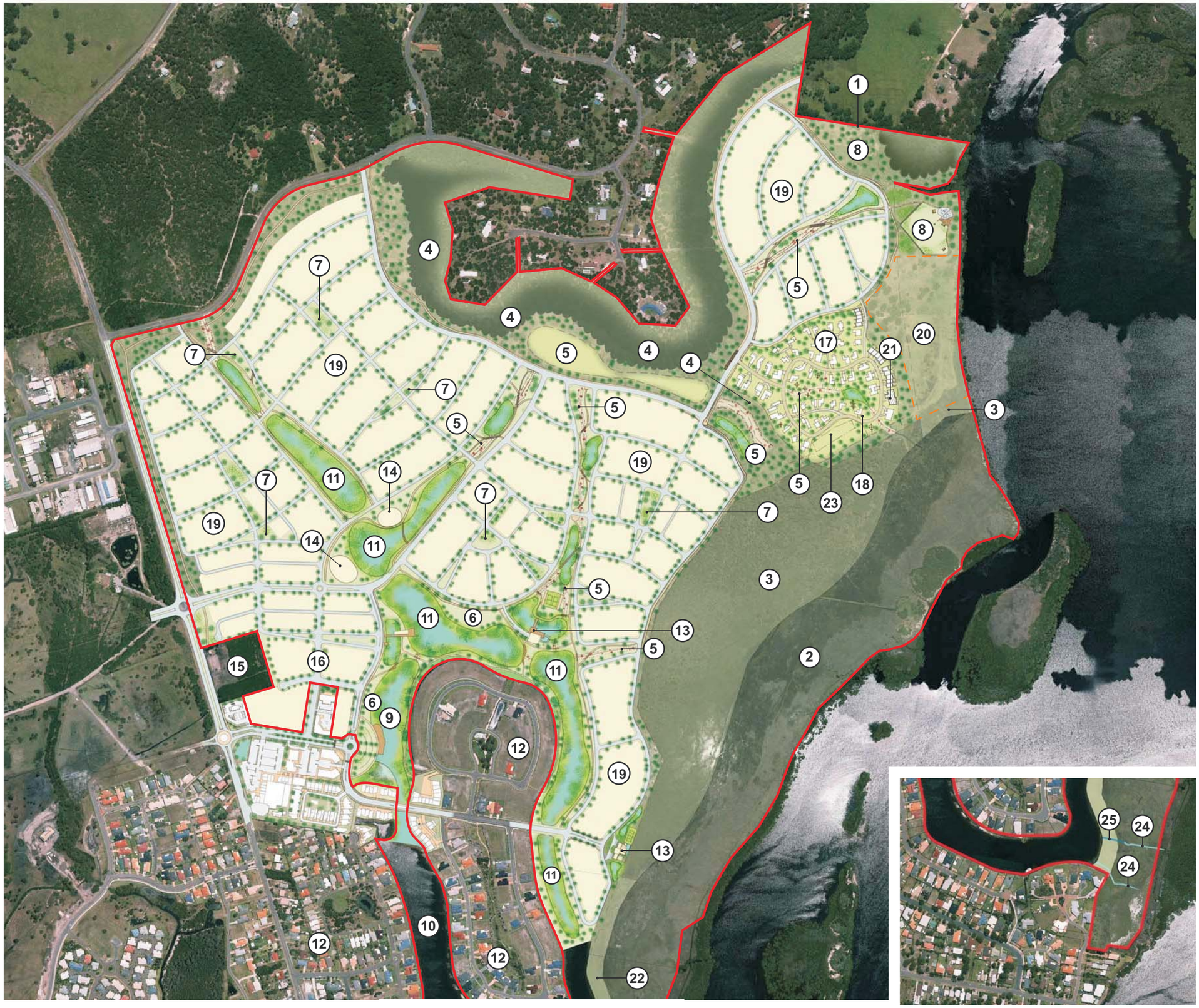

Item	Description
1	Extent of concept plan area 'Riverside' at Tea Gardens.
2	Existing 7(a) wetland zone.
3	Existing 7(b) buffer zone.
4	Wildlife movement corridor.
5	Water management & open space corridors.
6	Community parks incorporating walking/cycle ways, BBQs, children's play area equipment.
7	Community pocket parks.
8	Myall foreshore park including structured and unstructured open space.
9	Extended lake area for water detention & water quality management (2.0 Ha).
10	Existing detention and water quality lake.
11	New fresh water water quality management & detention ponds.
12	Existing residential development.
13	Precinct community facilities.
14	Future precinct community facilities.
15	Site area currently owned by Great Lakes Council.
16	Super Lots for future development.
17	Tourist lodgings precinct.
18	Conference & community facilities, associated low rise town house accommodation.
19	Proposed residential lot development to be developed under community title.
20	Future development site.
21	Existing house.
22	DCP buffer.
23	Location of known midden & buffer.
24	Existing drain outlet to Myall River.
25	Existing drain to Myall River to be extended to connect with existing lake.

Land Use Legend

Total Site	Ha	%
Open Space		
- Wetlands (zoned 7a)	28.4	12.4
- Buffer Zones (zoned 7b)	20.6	9.0
- Additional Conservation Buffer	1.4	0.6
- Wildlife Corridors	27.3	11.9
- Myall Foreshore Park	5.6	2.4
- Drainage Corridors, Ponds & Large Parks	35.1	15.4
- Pocket Parks	2.6	1.1
- Existing detention & water quality lake	6.7	2.9
Total	**127.7 Ha**	**55.7%**
Built Upon Area		
- Residential (including roads & community facilities)	83.6	36.5
- Tourist/Residential (Lodgings)	8.4	3.7
- Future Development Site	5.0	2.2
- Commercial/Retail	4.3	1.9
Total	**101.3 Ha**	**44.3%**
Total	**229.0 Ha**	**100%**

Figure 1.3

Concept Plan for Riverside at Tea Gardens

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_jan_03		
Date:	27/01/09	Drawing size:	A3
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties - Plan R.C - 03		
Scale:	Refer to Scale Bar		

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PROJECT YIELD TABLE

Project Application		
Lot Size Range	**No. of Dwellings**	**% of Total**
Multiple Dwellings <450m²/DW	61	16.0%
<450m²/DW	17	4.5%
450-550m²/DW	74	19.4%
550-650m²/DW	150	39.4%
>650m²/DW	79	20.7%
Super Lots for future development	-	-
Total	**381**	**100%**
Yield	381/ 29.3 Ha	13 DW/Ha
Concept Plan		
Lot Size Range	**Approx No. Dwellings**	**% of Total**
Multiple Dwellings <450m²/DW	96 approx.	16%
<450m²/DW	27 approx.	4.5%
450-550m²/DW	113approx.	18.9%
550-650m²/DW	239approx.	39.9%
>650m²/DW	124approx.	20.7%
Total lots	**599**	**100%**
Tourist lodges	**50**	**NA**
Town houses	**15**	**NA**
+Project Application	**381**	
OVERALL TOTAL	**980/65**	
YIELD	980/75.4 Ha	13 DW/Ha

Note: *yield not inclusive of tourist lodges or town houses*

Figure 1.4

Urban Development Structure Concept Plan

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_jan_04		
Date:	23/01/09	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties - Plan R.C -07		
Scale:	Refer to Scale Bar		

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The site is bounded by Myall River to the east and Myall Road to the west (refer to *Figure 1.2*). The Shearwater Residential Estate lies to the north of the site and residential development of Tea Gardens is to the south. The site has an approximate one kilometre frontage to Myall Street and two kilometre frontage to the Myall River. *State Environmental Planning Policy No. 14 – Coastal Wetlands* (SEPP 14) applies to wetlands within the eastern portion of the site adjacent to the Myall River. These wetlands were clearly identified along with a buffer to the wetlands and zoned for environment protection when the site was rezoned in 2000. The remainder of the site is available for urban purposes and zoned for mixed use urban development.

The site is flat with generally sandy soils. The majority of the site was previously used for a pine plantation and has been substantially cleared of native vegetation. Some scattered isolated occurrences of both pines and natives currently exist on the site.

Part of the Riverside Estate has previously been developed and comprises a range of residential, retail/commercial, recreation and tourist development including 261 residential lots that have been sold or are on the market, a 3600m^2 shopping centre and supermarket as well as a state of the art medical centre, service station and monthly markets. There are a range of development consents related to this area as a result of the staged nature of the development. The most relevant development consents are provided in *Annex B along with the history of the creation of the detention lake on the Myall Quays site.*

1.3 CONCEPT PLAN DESCRIPTION

The Concept Plan developed for the Riverside at Tea Gardens site illustrates a residential / mixed use precinct over the majority of the site and a tourist and residential component located in the north eastern corner of the site (refer to *Figure 1.3* and *Figure 1.4*).

Concept plan approval is sought for the following:

- an extension of the existing town centre on the north side of Shoreline Drive, to accommodate a range of uses (which will be subject to future applications) including additional retail and commercial uses (approximately 4 hectares);

- residential development of the site (covering approximately 84 hectares), which will include a variety of lots, access from Toonang Drive and Myall Street;

- an internal road network, upgrading of intersections and associated road works along Myall Street and other construction works, such as cycleways, external to the site;

- water sensitive urban design (WSUD) measures including a two hectare extension of the existing detention lake and the creation of three new freshwater detention basins and numerous additional ponds surrounded by parklands and extension of an existing channel which is connected to the Myall River to link the detention lake to the Myall River to enhance water quality management ;

- an open space network comprising 127 hectares in total which provides for public recreation, stormwater management, a wildlife corridor, conservation areas, and community facilities. Substantial areas (approximately 27 hectares) of the Residential 2(f) zoned land are proposed to be protected and enhanced as wildlife movement corridors, over and above those already protected within the Environmental Protection 7(a) and 7(b) zones (which comprise 28 and 21 hectares respectively); and

- the Concept Plan for Riverside at Tea Gardens has the potential to create 1045 dwellings as detailed in *Table 1.1.*

Table 1.1 Concept Plan Dwellings

Development	Number of Dwellings
Residential (variety of lots)	980
Tourist Precinct – lodges (individual lodge houses for permanent residential and tourist accommodation)	40
Tourist Precinct – units (permanent residential and tourist accommodation, maximum two storey in height)	15
Tourist Precinct – permanent residential	10
Total	**1045**

- an 8 hectare tourist/residential development (including a conference centre and accommodation);

- a residential subdivision in the north east portion of the site, together with a foreshore park of 5.6 hectares;.

- clubhouse facilities and associated tennis courts, active and passive open spaces, pool and BBQ facilities; and

- associated landscaping and infrastructure works.

Further descriptions of the Concept Plan and Project Application are set out in *Chapter 2*.

1.4 PROJECT APPLICATION DESCRIPTION

Project approval is sought for Stages 1, 2, 3, 4, 5, 6, 7, 8 and 9 and relates to Lot 40 DP 270100, Lot 5 DP 270561, Pt Lot 1 DP 270561, Pt Lot 2 DP 270561, Lot 1 DP 270100, Lot 10 DP 270100, Lot 19 DP 270100 and Lot 30 DP 270100 (refer to

Figure 1.5). Staging is discussed in *Section 2.11* of this report. The stages are grouped into three precincts as follows:

- Precinct 1 comprises Stages 1 and 2;
- Precinct 2 comprises Stages 3, 5, 6, 7, 8 and 9; and
- Precinct 3 comprises Stage 4.

The Project Application includes the following:

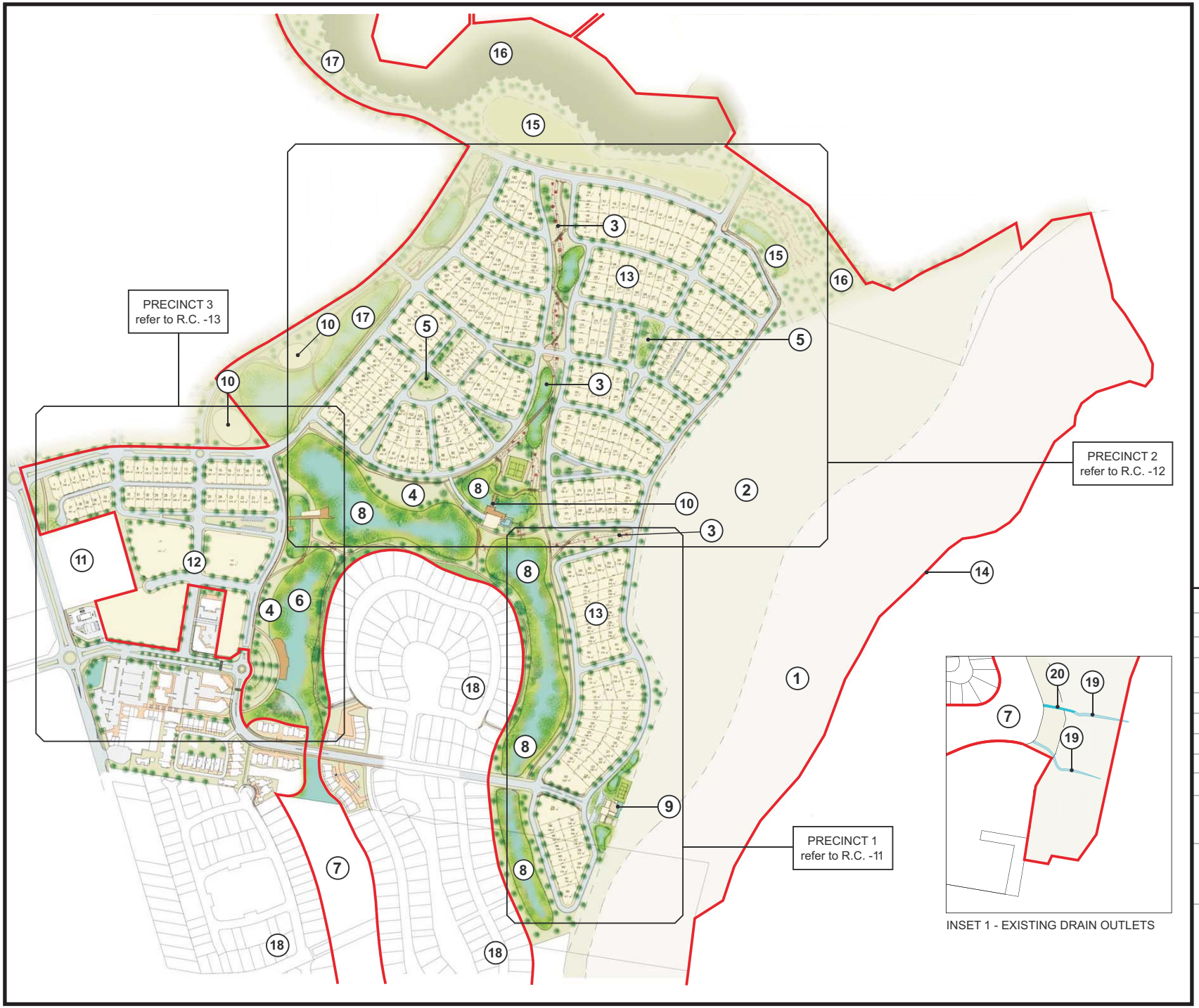
- the creation of residential lots as detailed in *Table 1.2;*

Table 1.2 Project Application Residential Allotments

Size of Lots (square metres)	Number of Lots	Number of Dwellings (%)
Multi dwelling lots	26	61
350 - 449	17	17
450 – 549	70	74
550 – 649	160	150
650 +	75	79
Total	**348***	**381**

* Includes 108 *home based business* lots which are discussed below.

- roadways and associated infrastructure throughout the proposed commercial area (no buildings are proposed in the commercial precinct as part of the Project Application);
- water sensitive urban design measures (WSUD) including a two hectare extension of the existing detention lake, the creation of three (3) new freshwater detention basins and numerous additional ponds surrounded by parklands and open space and the extension of an existing drainage channel which is connected to the Myall River to link it to the detention lake to enhance water quality management within the proposed development;
- construction of a new connection to Myall Street for vehicle access and construction of internal roads and cycleways;
- construction of a community clubhouse and associated tennis courts, active and passive open spaces, pool and BBQ facilities;
- the provision of buffer (21 hectares) to the wetlands (zoned 7(b) Conservation);
- the retention of approximately 28 hectares of wetlands zoned 7(a) Wetlands and Littoral Rainforest; and
- associated landscaping and infrastructure works.



INSET 1 - EXISTING DRAIN OUTLETS

PROJECT APPLICATION YIELD TABLE

Lot Size Range	No. of Dwellings	% of Total
Multiple Dwellings <450m^2	61	16.0%
<450m^2	17	4.5%
450-550m^2	74	19.4%
550-650m^2	150	39.4%
>650m^2	79	20.7%
Total	381	100%

Note: *Total Area 29.3 Ha @ 13 Dwellings per Ha*

Item	Description
1	Existing 7(a) wetland zone (to be further protected as community land).
2	Existing 7(b) wetland buffer zone (to be further protected as community land).
3	Water management & open space corridors.
4	Community parks incorporating walking/cycle ways, BBQs, children's play area equipment.
5	Community pocket parks.
6	Extended lake area for water detention & water quality management (2.0 Ha).
7	Existing detention and water quality lake.
8	New fresh water quality management & detention ponds.
9	Precinct community facilities. Refer to R.C. -31, R.C. -32 , R.C. -33, & R.C. -34
10	Future precinct community facilities.
11	Site area currently owned by Great Lakes Council.
12	Super Lots for future development.
13	Proposed residential lot development to be developed under community title.
14	Extent of project application.
15	Establishment of upper catchment. Dry & wet basins, as well as swales.
16	Augmentation & management of wildlife movement corridor.
17	Temporary works required in these areas to establish drainage & diversions (refer to engineering drawings).
18	Existing residential development
19	Existing drain outlet to Myall River
20	Existing drain to Myall River to be extended to connect with existing lake.

Figure 1.5

Project Application Plan

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_jan_05		
Date:	23/01/09	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties - Plan R.C -10		
Scale:	Refer to Scale Bar		

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The subdivision will be created under Community Title, as part of the existing approved Community Title development.

Approval is sought for one clubhouse sited within the centre of the Riverside development within a community precinct (Precinct 1). The clubhouse will form part of the community precinct including tennis courts, active and passive open spaces, and BBQ facilities. The clubhouse will be surrounded by parklands adjoining the freshwater treatment pond. The clubhouse will include a gymnasium, recreation rooms, children's play area, toilets, offices, lounge room areas, outdoor living area and lap pool (refer to Drawings R.C. -32 to R.C. -35 within *Volume 2* of the EA).

Further description of the Project Application is set out in *Chapter 2*.

Home Based Business Lots

The concept of the *home based business* lots is based on emphasising the nexus between home and work as a means of enhancing quality of life and choice of occupation. It has been recognised that a number of new jobs being created in western democracies are being created by micro enterprises and self employed people, which provides for new ways in which we live and work (Sirolli, 2007). In particular it has manifested in the growth of home based businesses. In Australia there are one million people that conduct business from their place of residence, which is slightly less than 50 per cent of all Australian businesses (Sirolli, 2007). It is one of the fastest growing sectors of the economy, which is facilitated by communication and technological advancements, such as the internet, and a quality of life decision to start a business (Sirolli, 2007).

The 381 residential lots incorporate 108 '*Home based business*' lots, which are located in two precincts, one in the south-west part of the site, at the Myall Road entrance to the development, and the other adjacent to the east side of the water body. These lots will provide for home based businesses with an employment base of up to two people that are not residents of the house. This will facilitate newly developing businesses to establish themselves. The '*Home based business*' lots are detailed in *Table 1.3*.

Table 1.3 Home Based Business Lots

Size of Lots (square metres)	Number of Dwellings
350 – 450	17
451 – 550	25
551 – 650	42
651+	24
Sub Total	**108**

The *home based business* lots in the overall residential subdivision will create an environment that supports new businesses and provides a place where people

can live, work and recreate. The two precincts will have a technology/ community meeting place that incorporates, meeting rooms and facilities to be accessible to all residents of the *home based business* lots.

The intention of the home based business lots is consistent with the definition of '***home business***' in the *Standard Instrument (Local Environmental Plans) Order 2006 (Standard LEP)*. In the Standard LEP home business "*…means a business carried on in a dwelling, or in a building ancillary to a dwelling, by one or more permanent residents of the dwelling that does not involve:*

(a) the employment of more than 2 persons other than those residents, or

(b) interference with the amenity of the neighbourhood by reason of the emission of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit or oil, traffic generation or otherwise, or

(c) involve the exposure to view, from any adjacent premises or from any public place, of any unsightly matter, or

(d) the exhibition of any notice, advertisement or sign (other than a notice, advertisement or sign exhibited on that dwelling to indicate the name of the resident and the business carried on in the dwelling), or

(e) the sale of items (whether goods or materials), or the exposure or offer for sale of items, by retail, except for goods produced at the dwelling or building, or

(f) the use of more than [insert number] square metres of floor area to carry on the business, but does not include bed and breakfast accommodation, home occupation (sex services) or sex services premises".

It also allows for *home industry* as set out in the Standard LEP. Home industry "*means a light industry carried on in a dwelling, or in a building ancillary to a dwelling, by one or more permanent residents of the dwelling that does not involve:*

(a) the employment of more than 2 persons other than those residents, or

(b) interference with the amenity of the neighbourhood by reason of the emission of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit or oil, traffic generation or otherwise, or

(c) the exposure to view, from any adjacent premises or from any public place, of any unsightly matter, or

(d) the exhibition of any notice, advertisement or sign (other than a notice, advertisement or sign exhibited on that dwelling to indicate the name of the resident and the light industry carried on in the dwelling), or

(e) the sale of items (whether goods or materials), or the exposure or offer for sale of items, by retail, except for goods produced at the dwelling or building, or

(f) the use of more than [insert number] square metres of floor area to carry on the light industry, but does not include bed and breakfast accommodation or sex services premises".

1.5 REPORT STRUCTURE

This Environmental Assessment report consists of three volumes. *Volume 1* contains an outline of the scope of the project, consideration of the relevant statutory and non-statutory provisions, a summary of the findings of the technical investigations undertaken as part of the environmental assessment, justification for the project and a draft Statement of Commitments.

Volume 1 includes the following chapters:

Chapter 1 provides an introduction and relevant background information and an overview of the site and project;

Chapter 2 outlines the scope of the project including a site analysis, discussion of the subdivision design and layout including details of alternative designs considered;

Chapter 3 considers relevant statutory and non-statutory provisions arising from relevant environmental planning instruments, development control plans and planning strategies;

Chapter 4 contains summaries of the key issues identified in the environmental assessment including measures and strategies proposed to mitigate any adverse impacts on the environment. The environmental assessment includes investigations in relation to urban design, water management, traffic management, flora and fauna, hazard management (bushfire, acid sulphate soils) infrastructure provision and heritage significance;

Chapter 5 examines the social and economic impacts of the proposal ;

Chapter 6 outlines the consultation that has taken place with government authorities and the community with respect to the proposed development;

Chapter 7 documents the draft Statement of Commitments which sets out the management, mitigation and monitoring measures to be implemented to minimise any potential negative impacts associated with the project; and

Chapter 8 draws conclusions based on the finding in the previous chapters and provides a justification in terms of the suitability of the site for the proposed development and the public interest.

Annexes within ***Volume 1*** include:

- *Annex A*: the initial Riverside at Tea Gardens and Myall Rivers Downs Master Plan prepared under State Environmental Planning Policy 71;

- *Annex B:* Previous Development Consents relating to adjacent development;
- *Annex C:* Environmental Assessment Requirements of the Director General;
- *Annex D:* Architectural and Landscape Design Brochures prepared by Crighton Properties;
- *Annex E:* draft Voluntary Planning Agreement (VPA) prepared by Crighton Properties;
- *Annex F: Community Management Statement – Myall Quays*, prepared by Mallesons Stephens Jaques, 1996, *Community Management Statement for the Myall Quays Town Centre*, prepared by Hunt and Hunt, 2008, and *Precinct Management Statements* for Precincts 1,2 and 3, prepared by Crighton Properties;
- *Annex G: Legal Opinion on SEPP 50 – Canal Estates* prepared by Malcolm Craig QC, March 2004;
- *Annex H:* Compliance with Relevant Policies;
- *Annex I:* Correspondence;
- *Annex J:* Solar Access: and
- *Annex K:* Cost Estimates.

Volume 2 includes the following plans:

- Riverside Concept Plan and Project Application Plans; and
- Riverside Estate Engineering Drawings

Volume 3 includes the following technical reports:

Volume 3A:

- *Construction Environmental Management Plan*, prepared by Environmental Resources Management (ERM), 2009;
- *Riverside at Tea Gardens Integrated Water Management,* prepared by Cardno Willing, 2008, including as annexures:
  - *Assessment of Water Quality Management Options,* prepared by Cardno Willing, 2004;
  - *Groundwater Assessment,* prepared by Coffey Geotechnics Pty Ltd (Coffey), 2007;
  - Fish Community Survey of the Riverside Lake, prepared by Harris Research Pty Ltd, 2007; and

- Riverside at Tea Gardens: Practical Considerations of Climate Change, prepared by Cardno Willing, 2008;

- *Riverside at Tea Gardens Probable Maximum Flood*, prepared by Cardno Willing, 2008;

- *Riverside Estate Project Application and Master Plan Area, Tea Gardens - Geotechnical and Acid Sulfate Soils Assessment,* prepared by Coffey Geotechnics Pty Ltd (Coffey), 2008;

- *Myall Quays Detention Lake Sediment Sampling and Analysis*, prepared by Coffey Geotechnics Pty Ltd (Coffey), 2007;

Volume 3B:

- *Ecological Site Assessment (including Threatened Species Assessment),* prepared by Conacher Environmental Group, 2008, incorporating the *Koala Habitat Assessment and Management Strategy* and *Ecological Site Management Strategy;*

- *Wetlands Assessment for Riverside at Tea Gardens* prepared by Geoff Winning, 2009;

- *Riverside at Tea Gardens Aboriginal Assessment* prepared by Environmental Resources Management (ERM), 2008;

- *Servicing Strategy* prepared by Tattersall Surveyors Pty Ltd (Tattersall Surveyors, 2008;

- *Review of s93 and s94 Requirements – Crighton Properties*, prepared by Connell Wagner Pty Ltd (Connell Wagner), 2007;

- *Traffic Impact Assessment*, prepared by Mark Waugh Pty Ltd, 2008; and

- *Bushfire Protection Assessment Riverside, Myall Road Tea Gardens,* prepared by Conacher Environmental Group, 2008.

Volume 3C

- *Myall River Downs / Riverside at Tea Gardens Recreation Study* prepared by Environmental Resources Management (ERM), 2008;

- *Myall Quays – Architectural and Landscape Design Guidelines*, prepared by Crighton Properties, 2006;

- *Riverside at Tea Gardens – Landscape Design Report and Detailed Design Manual*, Andrews Neil, , 2007;

- *Tea Gardens Retail Study - Update Report IBECON Study of 2000,* prepared by Wakefield Planning, 2007;

- *Riverside at Tea Gardens Economic Impact Statement,* prepared by Parsons Brinckerhoff Pty Ltd (PB), 2007;

- *Riverside @ Tea Gardens, Statement of Social Impacts*, prepared by Duo Consulting Pty Ltd (Duo), 2008;
- *An Assessment of Housing Issues relating to Riverside at Tea Gardens,* prepared by Duo Consulting Pty Ltd (Duo), 2007;
- *Riverside Design Report*, prepared by Roberts Day Urban Designers, 2007;
- *Riverside at Tea Gardens Design Forum*, prepared by Roberts Day Urban Designers, 2007;
- *Riverside at Tea Gardens Phase 1 Environmental Site Assessment* prepared by Environmental Resources Management (ERM), 2008; and
- *Riverside at Tea Gardens Construction Noise Impact Assessment* prepared by Environmental Resources Management (ERM), 2008.

1.6 DIRECTOR GENERAL'S REQUIREMENTS

The Director General's requirements for the preparation of the EA are provided in *Annex C* of this report. A summary of the key issues set out in the DGRs, as well as the relevant section in this EA report in which they are addressed is provided in *Table 1.4*.

Table 1.4 Director General Requirements

Key Issue	Relevant Section in the EA Report
General Requirements	
Part A: Concept Plan Application	
1. An executive summary;	Executive Summary
2. An outline of the scope of the project including: (i) any development options; (ii) justification for the project taking into consideration any environmental impacts of the project, the suitability of the site and whether the project is in the public interest; (iii) outline of the staged implementation of the project, if applicable;	Section 1.4, Section 2.11 and Section 8.1 and Chapter 2
3. A thorough site analysis and description of the existing environment	Figures 2.1 and 2.2, Section 2.1 and 4.19
4. Accurate mapping of zones for the site and surrounds, overlayed on the site survey plan;	Volume 2, specifically drawings R.C. 49 and R.C. 50
5. Consideration of any relevant statutory and non-statutory requirements and identification of any non-compliances with such provisions, in particular relevant provisions of Environmental Planning Instruments, Regional Strategies (including draft regional Strategies) and Development Control Plans;	Chapter 3, Annex H within Volume 1
6. Consideration of impacts, if any, on matters of national environmental significance under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999;	Section 3.1.1, Section 4.12
7. An environmental risk analysis of the project including consideration of the issues raised during consultation;	Section 4.21
8. An assessment of the potential impacts of the project and a draft Statement of Commitments, outlining environmental management, mitigation and monitoring measures to be implemented to minimise any potential impacts of the project;	Chapters 4, 5 and 7
9. The plans and documents outlined in Schedule 2;	Volume 2
10. A signed statement from the author of the Environmental Assessment certifying that the information contained in the report is neither false nor misleading; and	In side the front cover
11. A Quantity Surveyor's certificate of cost to verify the capital investment value of the project; and	Annex K of Volume 1
12. A detailed assessment of the key issues specified below and a table outlining how and where in the EA document these key issues and the above requirements have been addressed.	Chapters 3, 4, 5 and 8 and Table 1.4
Part B: Project Application	
1. The matters listed above in Part A (with the exception of Point 2);	Chapters 2, 3, 4, 5 , 7 and 8
2. A detailed description, including plan details, of the project application component (comprising Stage 1 of the development); and	Section 1.4 and Volume 2
3. Where relevant, demonstrate compliance with BCA and relevant Australia Standards for proposed building; traffic, road and parking; utilities' noise and flooding.	Chapters 3 and 4
Key Issues	
Part A: Concept Plan Application Environmental Assessment	
1. Strategic Assessment	
1.1 Justify the proposal with reference to relevant local, regional and State planning strategies. Provide justification for any inconsistencies with these planning strategies;	Chapter 3 and Annex H of Volume 1
1.2 Demonstrate consistency with the Sustainability Criteria set out in the	Section 3.4.2 and

Key Issue	Relevant Section in the EA Report
relevant Regional Strategy (including draft Regional Strategies);	Annex H of Volume 1
1.3 The proposal must demonstrate compliance with the provisions of *State Environmental Planning Policy No. 71 – Coastal Protection* ;	Section 3.3.6 and Annex H of Volume 1
1.4 The proposal should not include any elements which would be defined as Canal Estate development, as defined in *State Environmental Planning Policy No. 50 – Canal Estate Development*;	Section 3.3.5 and Section 4.6 and Annex G
1.5 Demonstrate that the proposed densities are appropriate for the future housing needs of the Tea Gardens area. Demonstrate compliance with the recommendations of the *Tea Gardens Housing Strategy* (May 2006) particularly relating to affordable housing types and their location;	Section 4.15
1.6 Provision of all development consents issued for the subject site and the adjoining site (known as Myall Quays) including the existing detention lake and connection to the Myall River;	Annex B of Volume 1
1.7 Provision of the Community Management Statement for the existing development adjoining the site, known as Myall Quays;	Annex F of Volume 1
2. Subdivision Design, Layout and Desired Future Character	
2.1 Demonstrate the consistency of the proposal with the character of existing development in terms of the locality, street frontage, scale, building envelopes and future built form controls, aesthetics, energy and water efficiency and safety;	Section 2.10, Section 4.16, Section 4.17, Section 4.18
2.2 Demonstrate the consistency of the proposed subdivision design and layout with the *Coastal Design Guidelines for NSW*, *NSW Coastal Policy 1997* and *SEPP 71 – Coastal Protection*;	Section 3.3.8, Section 3.3.6, Section 4.2 and Annex H of Volume 1
2.3 Identify the type of subdivision proposed across the site i.e. community,. Torrens, strata. A draft community management statement should be provided if community title is proposed;	Section 2.12 and Annex F of Volume 1
2.4 provide details of any staging that demonstrates that lots will be released in an orderly and coordinated manner and identify how the proposal relates to the existing and proposed future stages to ensure an integrated and holistic approach to environmental management;	Section 2.11 and Volume 2 Plans
2.5 Outline the long term management and maintenance of any areas of open space or conservation including ownership and control, management and maintenance funding, public access, revegetation and rehabilitation works and bushfire management;	Section 2.10, Section 2.12 and Annex F of Volume 1
2.6 Address any public access to the shoreline in accordance with the principles of ecologically sustainable development and the NSW Coastal Policy.	Section 4.7
2.7 Address safety and security of the proposal and provide mitigation measures where required.	Section 4.20
2.8 Demonstrate compliance with relevant zone objectives;	Section 3.5.1
2.9 Demonstrate the application of sound urban design principles in the design of the proposal;	Section 2.4, Section 4.17
3. Visual Impact	
3.1 Demonstrate suitability of the proposal with the surrounding area in relation to the proposed and potential bulk scale, amenity (including noise) and visual amenity having regard to the Coastal Design Guidelines of NSW (2003). In particular, address impacts on the amenity of the foreshore, loss of views from public places and cumulative impacts;	Section 2.2, Section 2.4, Section 2.6, Section 3.3.8, Annex H of Volume 1
4. Infrastructure Provision	
4.1 Address the capacity of existing infrastructure to accommodate the proposed development such as water, electricity gas,	Section 4.14

Key Issue	Relevant Section in the EA Report
telecommunications and their staging. Specific consideration should be given the capacity of the sewerage treatment facility at Hawks Nest to accommodate the proposal. Identify and describe staging, if any, of infrastructure works;	
4.2 A risk assessment of effluent disposal including the potential impacts and relevant mitigation measures in the event of a failure of the effluent disposal system through flood or other events;	Section 4.4, Section 4.14, Section 4.21
4.3 Provide details of any planning Agreements entered into or proposed as part of this development and the proponent payment of Section 94 contributions. Note: Any Planning Agreement must be outlined in the Statement of Commitments as an 'offer' under Section 93G of the Act. This should take the form of a draft agreement. Planning Agreements should only contain matters outside the scope of Section 94;	Section 2.13, Section 2.9.2, Chapter 7 and Annex E
5. Traffic and Access	
5.1 Prepare a Traffic Impact Study in accordance with the RTA's *Guide to Traffic Generating Developments*;	Section 4.20 and Volume 3
5.2 Protect existing public access to and along the coastal foreshore and provide, where appropriate, new opportunities for controlled public access. Consider access for the disabled, where appropriate;	Section 4.7.1
5.3 Demonstrate the compliance with sound urban design principles, including parking, access and transport. This must be demonstrate options, particularly as they relate to access to and from adjoining urban areas, with a view to minimise traffic loads on one or more particular access way. In addition consideration must be given to: - pedestrian/cycle access through the site; - public transport access though the site, with particular emphasis on road compatibility for bus access through the site; and - intersection capacity to withstand anticipated traffic loads. With respect to traffic and access, traffic modelling in accordance with the relevant standards is required;	Section 2.6, Section 2.10, Section 4.17, Section 4.20
5.4 Demonstrate the provision of access and servicing links between the subject site and Shearwater Estate (through the Myall Quays site). Consideration of any alternative access requirements of the Great Lakes Hawks Nest / Tea Gardens Conservation and Development Strategy is also required;	Section 4.20
6. Hazard Management and Mitigation	
Coastal Processes	
6.1 Address coastal hazards and the provision of the Coastline management manual. In particular, consider impacts associated with wave and wind action, coastal erosion, sea level rise and more frequent and intense storms in accordance with the principles of ecologically sustainability development ands the NSW Coastal Policy;	Section 3.3.7, Section 4.4.1
Contamination and Acid Sulphate Soils	
6.2 Address any existing contamination and required remediation of soils on the site. Particular regard must be given for Acid Sulphate Soils on the site, particularly relating to the excavation of these soils;	Section 4.9
Bushfire	
6.3 Address the requirements of Planning for Bush Fire Protection 2006 (RFS);	Section 4.11
Geotechnical	
6.4 Provide an assessment of any geotechnical limitations that may occur on the site and if necessary, appropriate design considerations that address these limitations.	Section 4.9.1
Flooding	
6.5 Provide an assessment of any flood risk on site (for the full range of	Section 4.4.1

Key Issue	Relevant Section in the EA Report
floods including events greater than the design flood, up to probably maximum flood; and from coastal inundation, catchment based flooding or a combination of the two) and having consideration of any relevant provisions of the *NSW Floodplain Development Manual 2005*. the assessment should determine: the flood hazard in the area; address the impact of flooding on the proposed development, address the impact of the development (including filling) on flood behaviour of the site and adjacent lands; and address adequate egress and safety in a flood event.	
6.6 Assess the potential impacts of sea level rise and an increase in rainfall intensity on the flood regime of the site and adjacent lands with consideration of *Practical Consideration of Climate Change – Floodplain Risk Management Guideline* (DECC, October 2007).	Section 4.4.1
7. Water Cycle Management	
7.1 Assess the impacts of the proposal on surface and groundwater hydrology and quality during both construction and occupation of the site;	Section 4.3, Section 4.4
7.2 Address potential impacts on the water quality of surface and groundwater, having regards to the relevant State Groundwater, Rivers, Wetlands and Estuary Policies. Consideration must be made for water impacts to the Myall River and identified SEPP 14 Wetlands. Particular regard must be given to how the proposal will minimise altered salinity, pH, litter, weeds, exotic fauna, gross disturbance of these wetlands, and nutrients intake to receiving water bodies;	Sections 3.3.3, 4.3, 4.4 and 4.5
7.3 An Integrated Water Cycle Management (IWCM) Plan based on Water Sensitive Urban Design principles is required. This must address the requirements of the *NSW Floodplain Management Manual*;	Section 4.4.1
7.4 Demonstrate the suitability of using the lake to be a receiving body for stormwater runoff;	Section 4.3 and Section 4.4
7.5 Demonstrate and justify the proposed widening and deepening of a channel connecting the existing lake with the Myall River, particularly in relation to the removal of vegetation fro the SEPP 14 wetland and an Endangered Ecological Community;	Section 4.5 and Section 4.7.2
7.6 Address the aims, objectives and requirements (particularly Clause 7) of State Environmental Planning Policy No 14 – Coastal Wetlands (SEPP 14), particularly in relation to the proposed removal of vegetation from the wetland for the proposed channel works.	Section 3.3.3
7.7 Stormwater management should be designed to ensure ongoing protection of the groundwater aquifer in accordance with the principles of ANZECC & ARMCANZ: *Guidelines for Groundwater Protection in Australia, National Water Quality Management Strategy*, Commonwealth of Australia, 1995. Ensure there is no impact on the existing groundwater aquifer and existing groundwater quality resulting from the proposal. Suitably justify the stormwater treatment measures to be used (amended by DGRs – 28/12/06) in the proposal;	Section 4.3
7.8 A Wetland Management Plan is required to guide the rational conservation, management, and restoration of the wetland habitats and their buffers;	Section 4.5
7.9 Details of any proposed dredging and reclamation activities including methods, uses, timing, extent and duration of works, nature of sediment to be dredged, etc. Specific details must be provided to outline any activities that may harm marine vegetation, or block the passage of aquatic fauna;	Section 4.7.2 and CEMP in Volume 3
8. Heritage and Archaeology	
8.1 An Independent Archaeology Report must be included in the Environmental Assessment. This must address and document	Section 4.10

Key Issue	Relevant Section in the EA Report
information requirements set out in the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DECC 2005) and Interim Community Consultation Requirements for Applicants (DEC 2004);	
9. Flora and Fauna	
9.1 Outline measures for the conservation of existing wildlife corridor values and / or connective importance of any vegetation on the subject land;	Sections 3.2.2, 3.2.5, 3.2.6 and 4.12
9.2 Address measures to protect and manage the SEPP 14 wetland and adjacent aquatic habitats;	Section 4.12
9.3 Outline and document commercial, recreational, and indigenous fishing activities that may be affected by the proposal. Investigation is required into whether the proposal will impact on the continuing operation and viability of nearby aquaculture or marine culture ventures;	Section 4.8
9.4 Demonstrate that any water discharge shall meet the benchmark set under the *Oyster Industry Sustainable Aquaculture Strategy* (amended by DGRs – 6/3/07);	Section 4.8
9.5 Outline measures for the conservation of flora and fauna and their habitats within the meaning of the *Threatened Species and Conservation Act 1995, Native Vegetation Act, 2003* and the *Fisheries Management Act, 1994* including, but not limited to Koala populations, and other EECs;	Section 3.2.4, Section 4.8
9.6 The EA must consider how the proposal has been managed to conserve flora and fauna habitats on the subject site and subject area. The measures proposed to mitigate any effect of the proposal must be provided, including any long term strategies to protect areas within the study area with threatened species. This may include elements that restore or improve habitats. Pre-construction monitoring plans or on-going monitoring of the effectiveness of the mitigation measure must be outlined in detail;	Section 4.12.
10. Socio-Economic Impacts	
10.1 Address social infrastructure including health services and schools. Consultation with service providers, Council, Department of health and Department of Education is required. Provide evidence of the capacity to service the proposed development and expected growth in the locality (amended by DGRs – 6/3/07);	Chapter 5
Part B: Project Plan Application Environmental Assessment (Stage 1 of the development)	
1. Compliance with Concept Plan	
1.1 The EA must demonstrate consistency with all Environmental Assessment requirements as detailed above in part 1, and the following additional matters;	Chapters 2, 3, 4, 5, 7 and 8
2. Subdivision Design, Layout and Desired Future Character	
2.1 Provide details of potential building envelope, built form and design quality controls and the means for implementing them. Ensure subdivision and road works are contained within the relevant zone;	Chapter 2, Chapter 4
2.2 Provide details of the construction of Community facilities where proposed as part of the Project Application for Stage 1 works;	Section 1.4 and Volume 2 Plans
2.3 Demonstrate compliance with BASIX requirements for any BASIX affected development (as defined by the Environmental planning and Assessment regulation 2000) that is proposed as part of the Project Application for Stage 1 works;	Section 4.3
3. Water Cycle Management	
3.1 Provide a detailed Construction Management Plan which mitigates the impacts of the proposal on surface and groundwater hydrology and quality on the site;	Volume 3
3.2 Provide a detailed Integrated Water Cycle Management (IWCM) Plan	Section 4.4.1 and

Key Issue	Relevant Section in the EA Report
based upon Water Sensitive Urban Design Principles;	Volume 3
3.3 Provide a detailed Stormwater Management Plan in accordance with the Environmental Assessment requirements for the Concept Plan application;	Section 4.4.1 and Volume 3
4. Bushfire	
4.1 Provide a detailed plan which addresses the requirements of planning for Bush Fire Protection 2006 (RFS), in particular in relation to asset protection zones, adequacy of water supply, and future management of areas of hazard remaining, including natural areas and buffer zones;	Section 4.11 and Volume 3
5. Earthworks and Filling	
5.1 Address impacts of earthworks and filling on the existing hydrology and water quality, the conservation of flora and fauna and the management of acid sulphate soils and any contamination on the site;	Section 4.3, Section 4.4 and Section 4.9,
5.2 Provide details of the source of fill including types of material and soils, and details of suitable revegetation planting;	Section 4.9
Consultation You should undertake an appropriate and justified level of consultation with the following agencies during the preparation of the environmental assessment: *(a) Agencies or other authorities:* • Great Lakes Council; • Department of Environment and Climate Change; • Department of Primary Industries (Fisheries); • NSW Rural Fire Service; • Department of Water and Energy; • NSW Maritime; • Department of Lands; • NSW Police Service; • State Emergency Service; • Hunter and Central Rivers Catchment Management Authority; • Prot Stephens – Great Lakes Marine Parks Authority; • Local Aboriginal Land Council/s and other Aboriginal community groups; and • MidCoast Water. *(b) Public:* Document all community consultation undertaken to date or discuss the proposed strategy for undertaking community consultation,. This should include any contingencies for addressing any issues arising form the community consultation and an effective communication strategy; The consultation process and the issues raised should be described in the Environmental Assessment.	Chapter 6

2 CONCEPT AND PROJECT PLAN

This chapter describes the Riverside Project and refers to the site analysis, discussion of the built environment, streetscape, facilities to be provided, staging, community title and alternatives considered.

2.1 SITE ANALYSIS

The site is located to the north of the existing residential area of Tea Gardens as illustrated in *Figures 1.1* and *1.2*. It represents a natural extension to the existing residential area of Tea Gardens and will provide a series of walking trails and public open space which connects the two areas.

The design and layout of the Riverside Estate was determined through an overlaying process of mapping various opportunities and constraints to determine the overall building envelope and the character of the open space network. The aim of the mapping exercise was to maximise benefits to future residents of, and visitors to Riverside while protecting areas of environmental sensitivity. The elements that guided the formulation of the design include:

- the surrounding wetland;
- the presence of Wallum Froglet and its habitat;
- visual impact and vistas from key vantage points;
- the integration of adjoining developed areas;
- traffic and access considerations;
- the stand of mature vegetation to the north of the site;
- the topography of the land and the existing drainage network; and
- areas of cultural significance.

Figures 2.1 and 2.2 illustrate key constraints of the site. The constraints map and site analysis plan identify the following ecological habitats and values and other features within the site in relation to the proposed development footprint:

- 7(a) Wetland and Littoral rainforest zone;
- 7(b) Conservation zone;
- DCP 22 buffer;
- asset protection zones;

Either of these accesses to be provided before registration of 700th lot

Elevated lookout

Line of sight to Yacaaba Headland

25 M APZ

25 M APZ

Second site access to be provided before registration of 500th lot

Provision for roundabout intersections triggered by future development of Myall River Downs site - not Riverside

24 M APZ

Existing drain outlet to Myall River to be extended to connect with existing lake

Existing site access

Only 2 access points allowed to Myall Street (DCP 22)

Existing Lake

Existing drain outlet to Myall River

Legend

- 7A Lands
- 7B Lands
- DCP Buffer
- 2.1 mAHD Contour
- 24 m APZ
- 25 m APZ
- 60 m Special Fire Protection Purpose (Relevant to Tourist Accommodation)
- Wildlife Movement Corridor 50m Core (DCP 22)
- Wildlife Movement Corridor - Buffer Edge 25m *Limited Works Allowed (DCP 22)*
- Proposed Actual Green Buffer
- Designated Water Course
- Location of Known Midden
- Coastal Saltmarsh (EEC)
- Swamp Oak Floodplain Forest (EEC)
- Swamp Sclerophyll Forest on Coastal Flood Plain (EEC)
- Wallum Froglet Habitat
- Existing Residence

Vegetation Communities

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

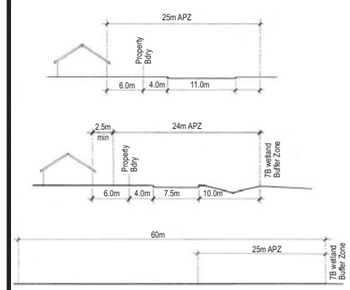

Figure 2.1

Constraints Plan

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_jan_06		
Date:	27/01/09	Drawing size:	A3
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties - Plan R.C - 49		
Scale:			

N

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- wildlife corridors;
- vegetation communities;
- endangered ecological communities;
- Wallum Froglet habitat;
- aboriginal midden site; and
- existing drainage lines.

The proposed development has been designed having regard to ecologically sensitive areas. The less disturbed vegetation communities (Wetland Fringing Woodland and Forests, Wetlands) with higher habitat values are afforded a higher level of retention and protection. The development will require the removal or modification of proportions of threatened species habitats within the more disturbed terrestrial open forest and woodland communities (Conacher Environmental Group, 2008b).

Careful consideration has also been given to the Coastal Design Guidelines and the feedback received during and following the Design Forum held in February 2006 in the preparation of the Concept Plan and Project Application.

2.2 *VISUAL IMPACT*

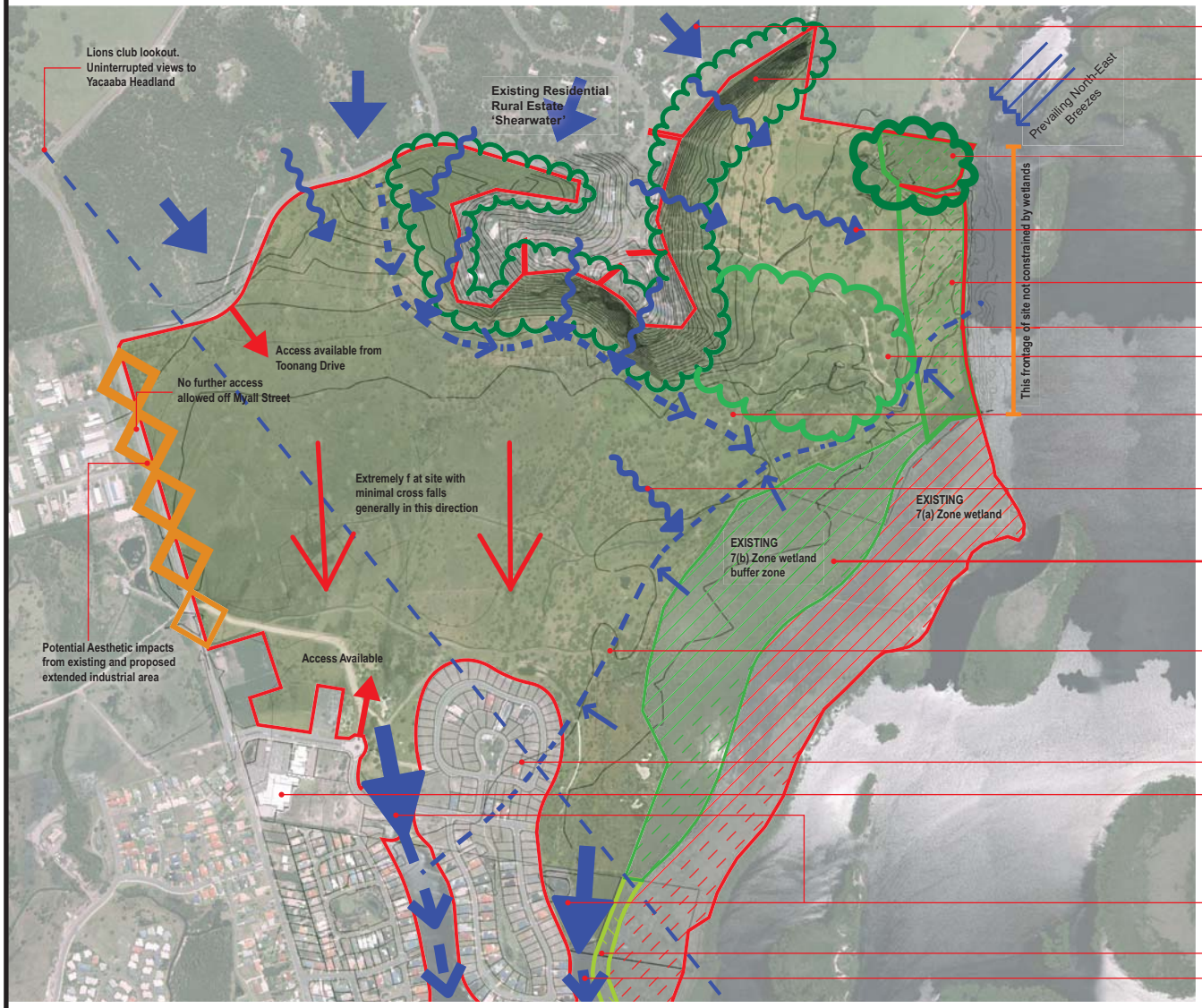
Tea Gardens is distinctive in terms of its high amenity and small scale development, reminiscent of a holiday town.

The site is flat and vacant. Most of the site was previously used for a pine plantation and has been substantially cleared of native vegetation. Some scattered isolated occurrences of both pines and native trees currently exist on the site. It has a long frontage (over one kilometre) to Myall Street, which is the main entrance to the township of Tea Gardens.

When approaching Tea Gardens from the north there is a spectacular view from the top of the ridgeline along Myall Street towards Yacaaba Head. The site comprises the middle-ground view from the public lookout at Elourera Park and when driving over the ridgeline (refer to *Figure 2.2*). Motorists have passing views of the site as it is adjacent to the Myall Street.

The land rises sharply to the north of the site. This land accommodates the North Shearwater Estate, which is characterised by low density residential properties that are occupied by dwellings in a bushland setting. West of this Estate is Elourera Park.

Land opposite the site on the west side of Myall Street is either vacant or occupied by industrial development. This land is also flat and was originally



Legend

Riverside at Tea Gardens Site Boundary

Figure 2.2

Site Analysis Plan

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_aug_07		
Date:	21/08/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties - Plan R.C - 02		
Scale:	Refer to Scale Bar		

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part of a pine plantation so there are some surviving pine trees and a few natives.

The site also has a two kilometre frontage to the Myall River. The majority of this is along the SEPP 14 Wetland. The views from the Myall River to the site are largely of the vegetated wetland and adjacent conservation area. The concept plan provides for the establishment of a mixed tourist / residential development in the north east of the site, adjacent to the Myall River.

Following inspections of the site and surrounds a number of locations were identified as potentially sensitive viewer locations, namely the public lookout at Elourera Park and Myall Street and the Myall River adjacent to the tourist / residential precinct.

Photomontages of the Riverside development have been prepared for the following viewpoints:

- from a view point at the lookout overlooking the site which is on the main transport route for traffic from the Pacific Highway into Tea Gardens; and

- from a view point on the Myall River overlooking the proposed tourist / residential precinct in the north east of the site.

The photomontages are provided in *Figure 2.3.* The Riverside development will be visible to motorists from the eastward approach as is the rest of the existing Tea Gardens township, with the view largely being dwelling roofs interspersed by vegetation canopies and open space corridors from this elevated viewpoint.

The views of the site from the dwellings on the south side of Toonang Drive are obscured by vegetation. The views from the dwellings on the north side of Toonang Drive, immediately opposite the site do not have a direct view of the site as they are either orientated away from the site or obscured by dense vegetation.

The view of the site from the residences along Toonang Drive north of the site is limited and will be obscured by the distance created by the extension of the existing water body and future landscaping as well as existing dense vegetation (refer to *Figure 2.2*).

Whilst the dwellings along Windward Circuit have existing views over the development site, this will not be the case in the future as dwellings will be built on the opposite side of that road (refer to *Figure 2.2.).*

Land opposite the site on the west side of Myall Street is either vacant or occupied by industrial development. These are not considered sensitive receptors.

The proposed tourist / residential precinct in the north east of the site will be visible from the Myall River. However these views are obscured by existing vegetation.

Photograph 1

Photomontage at the look out overlooking the site.

Photograph 2

Before photo of proposed tourist/residential precinct in north east section of the site from the Myall River.

Photograph 3

Photomontage of proposed tourist/residential precinct.

Figure 2.3

Photomontages of Riverside Site

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_nov_08		
Date:	10/11/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	-		
Scale:	-		

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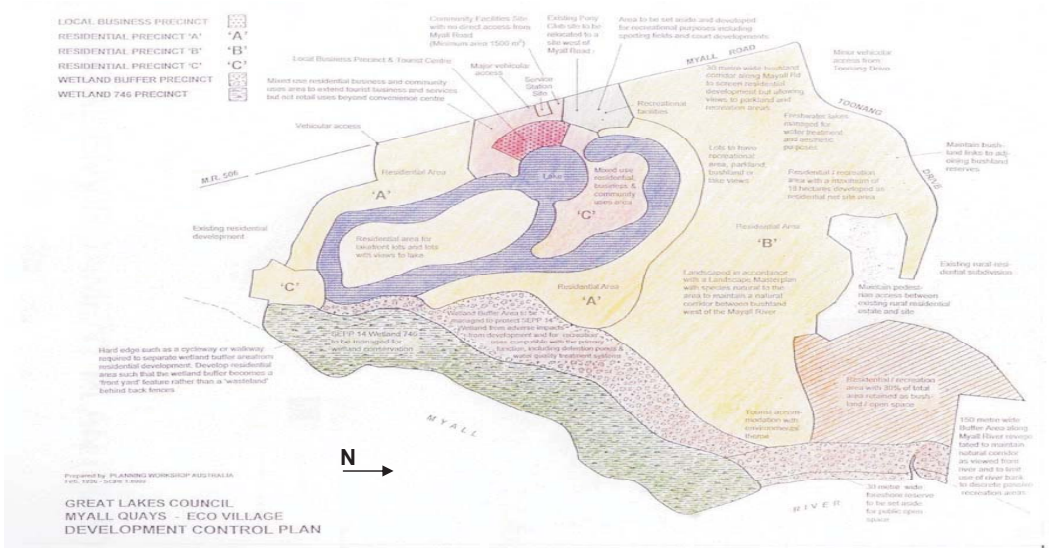

Development Control Plan

The DCP gazetted in 2000 identifies the following precincts:

Local Business Precinct

Local business precinct and tourist centre.

Residential Precinct A

Residential Area

Residential Precinct B

30m wide bushland corridor along Myall Road to screen residential development but allowing views to parkland and recreation areas.
Freshwater lakes managed for water treatment and aesthetic purposes.
Lots to have recreational area, parkland, bushland or lake views.
Residential / recreation area with a maximum of 18ha developed as residential net site area.
Landscaped in accordance with a landscape masterplan with endemic species to maintain a natural corridor between bushland west of the Myall River.
To provide a 100 m wide east / west wildlife movement corridor.

Residential Precinct C

Mixed residential, business and community uses area to extend tourist business and services but not retail uses beyond convenience centre.
Community facilities site with no direct access from Myall Road (minimum area 1,500 m^2).
Major vehicular access.
Service station site.
Existing pony club to be relocated to a site west of Myall Road, with this area to be set aside and developed for recreational purposes including sporting fields and court development.
Minor vehicular access from Toonang Drive.
Maintain bushland links to adjoining bushland reserves.
Maintain pedestrian access between existing rural residential estate and project site.
Tourist accomodation with environmental theme.

Wetland Buffer Precinct

Wetland buffer area managed to protect the SEPP 14 wetland from adverse impacts from development and for recreation uses compatible with the primary function, including detention ponds and water quality treatment systems.
30m wide foreshore reserve to be set aside for public open space.
Cycleway or walkway to separate buffer from residential area.

Wetland 746 Precinct

SEPP 14 wetland 746 to be managed for wetland conservation.

The two DCP maps opposite depict the project location and a comparison of the lastest and original can be made.

Figure 2.4

Great Lakes Council-Myall Quays Eco Village Development Control Plan Precinct and Alternative Residential and Golf Course Development

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_aug_09		
Date:	26/08/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties		
Scale:			

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The Concept Plan has been designed in response to unique features, both internal and external to the site, so that it is linked to the landscape. Open space corridors have been created along view lines from the public lookout to the headlands. Tree planting and a network of water bodies along the open space corridors will enhance the view lines. The internal north-south streets have been aligned the view lines to create a layered view comprising parks, dwellings and the volcanic peaks which form the headlands to Port Stephens.

The design and layout of the estate has been further enhanced by the selection of native vegetation and designated setbacks from Myall Street.

The site will also be visible from the surrounding waterways. Riverside has been designed to reduce the visual impact from the waterway by providing appropriate buffer zones which will be generously landscaped. Further, the Landscape Design Report has recommended a variety of edge treatments to reduce the visual impact of the proposal.

2.3 CONSIDERED ALTERNATIVES

In 2002 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. This proposal which differs from the current proposal was developed in accordance with the Great Lakes Council Myall Quays - Eco Village Development Control Plan. *Figure 2.4* identifies the DCP vision and the other development alternatives.

The above proposal involved the extension of the Myall Quays development including additional housing, commercial, sporting and tourist facilities on the remaining 179 ha of the site. The strategy included additional stormwater detention basins and state of the art rainwater harvesting strategies to support water reuse on approximately 600 new residential lots as well as a nine hole golf course.

The Tea Gardens and Hawks Nest urban areas at the time of the Myall Quays L.E.S. (1991) had the capacity to accommodate about 600 and 1,300 new residential lots respectively. It was determined that the proposed project site could accommodate about 1,000 dwellings together with tourist developments, which would represent a significant development element in the local context. The identification of additional urban development potential saw the proposal redesigned in 2003 to better represent the local context, changing trends and state of the art residential land use needs of the Tea Gardens/ Hawks Nest area. Three (3) major factors were identified which lead to the original proposal being modified to its current form:

Existing Infrastructure

Hawks Nest currently has an 18 hole golf course and there is a nine hole golf course proposed in North Hawks Nest. Therefore there was likely to be little or no demand for a nine hole golf course at Riverside, Tea Gardens.

Planning Context

The Department of Planning (DoP) identified that the local context of the Tea Gardens/ Hawks Nest area had changed significantly since the initial proposal and residential land was identified as being in short supply. The proposed use of residential land for a nine hole golf course within 100 metres of a proposed district shopping centre was seen as an inefficient use of residential land. The resultant low density residential development was not considered in the local community's best interests.

Whilst this redesign process was being undertaken, Great Lakes Council released a housing strategy which identified a new housing density requirement in order to address the demand for housing within the area. A residential density of 13 dwellings per hectare for new residential areas would be required in all future developments. Given that approximately 300 lots had already been developed from the site, the residual (600) residential dwellings and a golf course would not have met the residential density requirement stipulated by Council. The proposal was amended and currently achieves the required residential densities.

Environmental Constraints

The proposed golf course would have been a heavy user of water resources. This significant use of water was not seen as the most appropriate use of local resources nor was it seen as presenting an environmentally appropriate design for the local area. The golf course would have also required the use of chemicals and pesticides to maintain the course. The location of a golf course in such close proximity to Myall River, the adjoining SEPP 14 Wetlands, and the existing artificial lake (within the Myall Quay's precinct on the site) would have increased the risk of chemicals and pesticides used on the golf course entering the water treatment system. It was therefore determined that an alternative design was required which provided a more appropriate response to the environmental context of the local area.

2.4 DESIGN PRINCIPLES AND VISION

The design approach is based on the outcomes of design forum and principles of traditional neighbourhood design. The overarching principles that emerged from the design forum serve as aims of the concept plan. The principles are to:

- preserve the character of this (Tea Gardens) iconic town;
- reinforce the unique community spirit town of self helpers; and
- protect and enhance natural assets.

The principles of traditional neighbourhood development (TND) incorporate:

- walkable neighbourhoods, in which the neighbourhood is limited in size so that the majority of the population is within a five minutes walk of its centre;
- connected networks whereby thoroughfares are designed so that there are alternate routes to most destinations, thereby promoting greater permeability;
- a mix of buildings and uses to integrate a range of housing types and work places;
- quality open space in the form of specialised plazas, squares, playgrounds and parks; and
- community buildings such as recreation facilities, meeting rooms and the like, that are located within open spaces or at the termination of important views to serve as important land marks.

The incorporation of these principles into the concept plan is described further in the next sections.

2.5 BUILT ENVIRONMENT

Riverside will be a combination of traditional housing lots and smaller lots, with at least ten percent of the lots less than 450 square metres in area, in accordance with Council's adopted Housing Strategy. The development will achieve a net density of at least 13 dwellings per hectare across the site, in accordance with Council's adopted Housing Strategy. The different lot sizes and house types provided for in the Riverside development are detailed within Drawings R.C. -11 to R.C. – 14 and R.C. -43 to R.C-48 within the Concept and Project Application Plans provided in *Volume 2*.

In line with Council's Housing Strategy, all proposed buildings will be low density, detached or semi detached and restricted to a maximum height of 9 metres. These building controls combined with streetscape planting will create a low impact, natural coastal living environment.

The concept plan includes tourism facilities and residential development in the north east portion of the site. This precinct includes larger lots able to retain existing trees amongst the lodges and dwellings.

The development of Riverside provides a unique opportunity to formulate architectural and landscape design guidelines that will assist property owners to construct homes which are both distinctive and innovative and will provide the occupiers with enhanced privacy and comfort.

The primary reasons for wanting to effect more control over building activities in Riverside are:

(a) to encourage the care of the environment within the estate and to foster ecologically sustainable design to alleviate escalating Local Government costs, and to reduce the cost of energy;

(b) to preserve the design integrity and architectural quality of homes in the estate to add value to all property in the precinct;

(c) to preserve and enhance the existing landscape and the quality of the streetscape to provide the residents in the community with an environment they can enjoy and take pride in;

(d) to maintain the highest possible aesthetic standards to assist in establishing Myall Quays as the most attractive and desirable place to live on the Mid-North Coast; and

(e) to prevent any owner building a home in the estate which, because of its inappropriate design relative to the block on which it is proposed to be built, devalues the surrounding properties, causing financial damage to the neighbours (Crighton Properties, 1996).

The Design Guidelines link to the Community Association By-Laws and Management Statement. The Community Title arrangements are discussed in detail within *Section 2.12*.

In order to ensure that new developments adhere to the design guidelines a Review Committee has been established. The Review Committee, consisting of two design consultants nominated by Crighton Properties and a Director of Crighton Properties, has been established as a sub Committee to the Executive Committee of the Community Association.

The Review Committee's role is to ensure that the development preserves and protects the estate in a natural environment and maintains the concept, image and aesthetic quality of the development.

To that end no building, dwelling, accessory building, fence or other structure shall be erected, placed, demolished or altered on any lot within the community parcel until the proposed design and documentation including site plan, floor plans, elevations, together with details, specifications, external finishes and a construction programme has been approved in writing by the Review Committee (Crighton Properties, 1996).

An architectural guideline information brochure has been prepared which outlines the theme of the estate, the residential built form guidelines including

roofing, siting and massing of the residential built form, fencing heights, styles and wall colours and finishes. The brochure details the pre-lodgement requirements for the preparation of plans to be submitted to the Review Committee prior to submission with Great Lakes Local Council.

The architectural assessment has acknowledged that the extension of the existing detention basin will create a visual connection between the existing residential subdivision of Admirals Point Tea Gardens and Riverside. An Architectural Guideline has therefore been produced for Admirals Point to provide a more cohesive residential design which is consistent with Riverside. The guideline identifies the appropriated location of dwellings and their presentation to the foreshore and identifies the preferred landscape treatment of the foreshore which is to be provided and maintained by the Community Association.

The Architectural and Landscape Design Guidelines prepared by Crighton Properties also details design considerations for energy efficiency, water conservation, lighting and open space design. The details of the design requirements are within *Annex D* of *Volume 1.*

2.6 STREETSCAPE

Street Type and Streetscape

The design approach is based on the outcomes of consultation with the community and principles of traditional neighbourhood design. The street type and layout design incorporates a street hierarchy to provide streets that fulfil their designated functions and create a legible, safe and attractive environment (refer to Concept and Project Application Plans R.C. -36 to R.C. -42 within *Volume 2*).

The new entry street from Myall Street is a four lane divided road, which will feature an attractive tree lined avenue as an entrance to the development. The street types have sufficient reservation widths to accommodate public utility services, landscaping and footpaths where appropriate.

The street network supports the provision of a public transport route with the main street having sufficient pavement width to cater for buses and the layout allowing buses to service the site, via a loop route, without having to double back on themselves.

The internal arrangement provides for six separate new connections to the existing road network with two to Toonang Drive, one to Myall Street, two to Shoreline Drive and one to Myall Quays Boulevard.

A comprehensive street planting scheme has been developed to add colour and softness to the built form. The following figures include proposed planting to be incorporated within each street type.

Pedestrian and Cycle Circulation

Walkability and cycle access is a key feature of the development of the site, with a cycle / pedestrian network through the residential subdivision and integrated with the commercial centre and the wider area. The street network is designed as an environment that is equitable for the pedestrian, cyclist and motorist. The proposal includes a range of inter-connected on street and dedicated off street cycle ways and pedestrian access ways.

2.7 *MIXED TOURIST/RESIDENTIAL PRECINCT*

The Concept Plan incorporates a mixed tourist / residential precinct within the north east portion of the site. The precinct will incorporate a tourist / residential development consisting of buildings scattered within a bushland setting, supplementing the adjacent wildlife corridor and increasing fauna movement across the site. The precinct will include 50 tourist lodges (including 10 permanent residential dwellings and 40 tourist / permanent dwelling) and 15 units. Whilst subject to future design, the form of the buildings will generally be two storeys in height in keeping with Council's revised draft Housing Strategy. The layout of the tourist/residential precinct is detailed in Drawing R.C – 14 within the Concept and Project Application Plans of *Volume 2*.

2.8 *COMMUNITY FACILITIES*

Each of the residential precincts within the overall development of Riverside will have their own unique focal point and facilities. Concept approval is sought for four club houses and recreational facilities (refer to *Figure 1.3*). The club houses are proposed to provide entertainment, recreation, health and small business support amenities. Project approval is sought for one of the club houses, located within Precinct 1, as detailed within Drawings R.C. -32 to R.C. -35 within *Volume 2*. Separate applications will be lodged for the remaining three club houses in conjunction with the development of those stages.

2.9 *RECREATION FACILITIES*

A Recreation Study has been prepared (ERM, 2008d) to assess the existing provision of, and future demand for active recreational facilities within the Tea Gardens/Hawks Nest area (refer to *Volume 3* of the EA). Both Tea Gardens and Hawks Nest have extensive areas of existing public open space and have local and/or district level facilities (Great Lakes Council, 2003a and ERM 2008d). The location of the existing recreational facilities in the Tea Gardens /Hawks Nest area is illustrated in *Figure 2.5*.

Legend

1. Library/Community Centre
2. Golf Course
3. Pool
4. Myall Sports Reserve
5. Memorial Park Public Reserve
6. Pony Club Site

Figure 2.5

Existing Recreational Facilities in the Tea Gardens/Hawks Nest Area

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_aug_10		
Date:	20/08/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	1:25,000 Topo Series, Port Stephens Sheet		
Scale:	Refer to Scale Bar		

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The structured facilities in Tea Gardens / Hawks Nest consist of courts and fields and include the Memorial Park Public Reserve (Lot 6) in Tea Gardens and the Myall Sports Reserve (R86322) at Hawks Nest. The Tea Gardens reserve is classed as a large district field comprising four small multi-use fields, toilets and storage facilities, and is 1.2 hectares in area. The reserve in Hawks Nest is classified as large district courts and field, which is comprised of a large multi-use field, two tennis courts, one croquet court, swings, toilet facilities and a park, and is four (4) hectares in area (Great Lakes Council, 2003a).

Open space in the area has typically been provided in the following ratios:

- small parks at about 25%;
- large parks without structured facilities at about 30%;
- courts at about 15%; and
- playing fields at about 30%.

Council has provided three community facilities in the Tea Gardens/Hawks Nest area, which are:

- the Hawks Nest/Tea Gardens Community Centre in Hawks Nest;
- the Hawks Nest/Tea Gardens Preschool in Hawks Nest; and
- the Hawks Nest/Tea Gardens Branch Library.

The Hawks Nest Community Centre at 71 Booner Street (site area 1012 square metres) has a capacity to accommodate 200 people sitting and 300 people standing and provides bathroom and parking facilities (Great Lakes Council, 2003b). However, Council considers that it is inadequate to provide an acceptable level of community service (Great Lakes Council, 2003a). It is Council's strategy to construct a new consolidated community facility in Tea Gardens and adapt the existing centre for undetermined uses.

There is currently an 18-hole golf course Hawks Nest, while a community swimming pool and parking area is located in Tea Gardens adjacent to the Singing Bridge.

In addition to the above, the Tea Gardens Grange Retirement Village provides a range of community facilities built to accommodate the needs of its 285 estimated (self care) residents. These facilities include a swimming pool, a library, a croquet lawn, a billiard table, a large lounge and covered deck plus a meeting hall/and dance floor/indoor bowling area.

The proposed Hermitage Retirement Village is expected to be completed by 2011 and will include a range of facilities including: indoor swimming pool, bowling green and tennis courts. While these facilities will mainly cater for

the demands of the residents, they will also potentially reduce demand by the wider community for similar recreational facilities.

2.9.1 Tea Gardens and Hawks Nest Section 94 Contributions Plan

The Tea Gardens and Hawks Nest Section 94 Contributions Plan (Great Lakes Council, 2003a) levies residential development for six types of public facilities that provide community benefit in the area, including open space, such as parks, playing fields and courts and community facilities such as libraries and community centres.

Great Lakes Council (Council) considers that there is currently sufficient space in the large parks, courts and fields to expand facilities and that additional land would not need to be acquired until the future population reached 4123 (expected in 2011). As a consequence, Council has resolved that it will acquire land only for the provision of small parks within Myall Quays, Myall River Downs and Banksia Garden Estate, at a rate of 7.1 square metres per person (25% of Council's open space provision of 28.3 square metres per person).

The Section 94 Plan states that Council will not levy contributions to acquire land for new large parks, playing fields and courts, including those proposed in future stages of Myall Quays, because:

- existing large parks can be augmented to provide additional fields and courts for the public as the need arises;
- Council does not wish to increase its recurrent costs to maintain separate, dispersed facilities; and
- there is little reason to acquire and maintain additional land given the current high provision of open space and opportunities to use it more efficiently.

2.9.2 Additional Recreational Facilities

Council acknowledged that to accommodate the expected population growth in Tea Gardens and Hawks Nest of the magnitude predicted over the next 25 years, existing public services and facilities will need to be extended and other facilities may need to be provided (Great Lakes Council, 2003c). Council has estimated that by 2011, all community facilities (such as community halls, centres and libraries) are expected to be used to capacity (Great Lakes Council, 2003a).

Structured Open Space

Council's Section 94 Contributions Plan requires the provision of approximately 14.4 hectares of structured open space (15% courts and 30%

playing fields) (refer to the *Recreation Study (*ERM 2008d) provided in *Volume 3* of the EA).

Current development plans show 15.9 hectares of recreational land. This represents a current surplus of approximately 1.5 hectares which is carried forward if all future developments provide their full complement of open space.

The structured open space requirement for Riverside at Tea Gardens and Myall River Downs is 6.4 hectares which, in accordance with the Voluntary Planning Agreement between Crighton Properties and Great Lakes Council (refer to *Annex E* of *Volume 1* of the EA), is being provided within the Myall River Downs site (refer to *Figure 2.6*). As detailed within Table 4.2 of the Recreation Study (ERM, 2008d) (refer to *Volume 3* of the EA), an additional 4.3 hectares of structured open space is required in addition to that required for Riverside at Tea Gardens (which is required to provide 2.5 hectares) and Myall River Downs to meet the future needs for both Tea Gardens and Hawks Nest and would be recovered in section 94 contributions from North Shearwater, infill development within Tea Gardens and development within Hawks Nest. The full compliment of structured open space attributable to Riverside at Tea Gardens is to be provided at the Myall River Downs site as provided for in the Voluntary Planning Agreement (see *Annex E*).

2.10 OPEN SPACE AND LANDSCAPE DESIGN

A variety of open space typologies are provided including plazas, pocket parks and corridors. Open space corridors have been located and designed in response to the steep topography to the north of the site, overland flow paths and the high water table. The corridors are linked to create a connected system for future residents and fauna. A variety of swales, ponds and will manage water runoff.

Each of the open space area has lots that are orientated towards them providing opportunities for passive surveillance in the future. This layout will also provide an address to the open spaces, creating attractive and comfortable open spaces.

Open Space Corridors

The open space corridors have been designed as multi-function corridors that address drainage water treatment, pedestrian/cycle access, recreation and amenity (refer to Drawing R.C. -15 within *Volume 2*). The corridors have been designed in accordance with the following principles:

- maximise accessibility through the use of "soft engineering" principles, the use of batters and ramps in lieu of retaining walls to provide logical pedestrian connections. In addition, a series of small bridges will be provided where crossing of drainage lines is required;

Figure 2.6

Myall River Downs Sporting Complex Sketch

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_aug_11		
Date:	26/08/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties		
Scale:			

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- maximise passive surveillance through selective planting of shrubs and a focus on the use of groundcovers and clean trunked canopy trees. In addition to sensitive landscaping the use of pedestrian lighting will be incorporated where appropriate.

- provide for drainage requirements during high flow events through the inclusion of a defined channel which will be planted with species that tolerate periodic inundation; and

- provide for separation of the private recreation and club facilities through subtle landscape solutions that integrate with the public domain landscaping (Andrews Neil, 2007).

Tenure

All parks and open space will remain under the ownership of the Community Association. The Community Association will raise funds and undertake management in accordance with the various management plans prepared for the site.

Maintenance

The landscape contractor will be responsible for the maintenance of all the landscaped areas for twelve months after practical completion has been awarded. When the twelve month maintenance period is completed the ongoing maintenance will be the responsibility of the Community Association (Andrews Neil, 2007).

2.11 STAGING

An indicative staging program is shown on Drawing R.C. -08 within *Volume 2* of the EA. A summary is provided in *Table 2.1.*

Table 2.1 Staging Program

Stage Number	Number of Lots
1	48
2	23
3	44
4	37
5	28
6	53
7	62
8	45
9	41
10	166
11	293
12	65
13	140
Total	**1,045**

2.12 COMMUNITY TITLE

The Community Title is divided into 5 precincts as shown in Drawing R.C. -09 within *Volume 2*.

The Community Management Statement is already in operation for the Riverside development and identifies the terms binding the Community Association, the Executive Committee and any future landowners with respect to the Community Scheme. The commercial precinct (Myall Quays Town Centre) will be managed under separate Community Title to the residential development. The Community Management Statements for Myall Quays and the Myall Quays Town Centre are provided in *Annex F*, within *Volume 1* of the EA.

All footpaths, cycleways, open space areas, parks and water treatment facilities outside of road reserves will be owned by the Community Association, as detailed within Drawing R.C. -09. Public access to these areas (excluding the clubhouses) will be provided and encouraged. Roads will be dedicated to Great Lakes Council.

The by-laws detailed within the Community Management Statement relate to the control and preservation of the essence or theme of the Community Scheme and therefore can only be revoked or amended by a unanimous resolution of the Community Association. The Management Statement includes the following requirements for development within the Riverside site:

- the architectural and landscape standards which outline the standards/ requirements for the design of residential development and community property;
- approvals process for the construction and/or modification of buildings or landscaping;
- outlines the responsibilities of the Community Association and Executive Committee in the control, management and maintenance of community property;
- provides regulation of fence heights, collection of garbage, car parking, the keeping of animals, TV Aerials, etc; and
- identifies the need for the Community Association to ensure that the appropriate insurances are obtained and managed for all community property.

The Community Management Statement for Myall Quays does and will continue to apply to the community land within Riverside at Tea Gardens. Alterations to the Community Management Statement are unable to be made without unanimous resolution of the Community Association, however, additional controls at the precinct level (via Precinct Management Statements)

are proposed to be implemented to restrict development within the community lands of jetties and pontoons, to overcome By Law 4.17 of the Community Management Statement, a stance which the Architectural Review Panel has maintained since its inception. The draft précis of the Precinct Management Statements for Precinct 1 is provided within Annex F of *Volume 2*. To date, the Community Association has adopted a policy of not permitting any jetty / pontoon structures to be erected on community land.

2.13 CONTRIBUTIONS

Section 94 Contributions

Section 94 of the EP&A Act enables consent authorities to levy contributions on developers towards the cost of providing local public infrastructure and facilities required as a result of development. Contributions can only be sought by councils where there is an adopted contributions plan in place.

Section 94 contributions are based on two key concepts:

- reasonableness in terms of nexus (the connection between development and demand created) and apportionment (the share borne by future development); and
- accountability both public and financial.

A Section 94 contribution can be satisfied by a dedication of land, a monetary contribution, material public benefit or a combination of all three (Connell Wagner, 2007).

The Minister, when determining an application under Part 3A of the EP&A Act, must have regard to any contributions plan that is in place pursuant to section 94D. The Minister may also have regard to any planning agreement that is being negotiated. Section 94 is the exclusive source of power for a Council to impose a condition requiring land dedication or monetary contributions, and this power must be specifically authorised by a duly adopted section 94 contributions plan ("CP"). This is an important consideration since a Council wishing to impose such conditions outside section 94 is acting out of power unless these are done under the auspices of a planning agreement (Connell Wagner, 2007).

The Connell Wagner (2007) Report identifies that the Great Lakes Council has in place an "LGA wide" section 94 Contributions Plan (Great Lakes Wide Section 94 Contributions Plan) and a specific Contribution Plan for the Tea Gardens/Hawks Nest area (Tea Gardens & Hawks Nest Section 94 Contributions Plan). These provide details of the various facilities that the Council intends to provide to cater for population growth.

The LGA wide Contributions Plan has an effective life to 2009/2010 and includes provision for the following public facilities:

- library facilities;
- rural fire fighting facilities; and
- administrative building (Connell Wagner, 2007).

The Tea Gardens/Hawks Nest Plan has an effective life to 2010/2011 and includes provision for the following:

- open space, such as parks, playing fields and courts;
- cycleways;
- community facilities such as libraries and community centres;
- surf life saving facilities; and
- upgrading the road network to accommodate increases in traffic (Connell Wagner, 2007).

Voluntary Planning Agreement

Recent planning reforms have widened the gambit of the contributions system to include new provisions under Section 93 and Section 94A of the EP&A Act, which provide greater flexibility as to the means of levying a contribution. The amendments provide for the following methods of funding local infrastructure by a consent authority through:

- Section 94 contributions;
- Section 94A levy; and
- Planning Agreements (Connell Wagner, 2007).

Provisions for planning agreements have been codified under section 93 of the EP&A Act. Planning agreements are intended to be voluntary and can be entered into as part of the rezoning or development approval process. Planning agreements may be directed towards achieving the following:

- meeting the demands created by development for new public infrastructure, amenities and services;
- securing off-site planning benefits for the wider community;
- compensating for loss of or damage to a public amenity, service, resource or asset by development through replacement, substitution, repair or regeneration; and

- meeting the recurrent costs of facilities and services (Connell Wagner, 2007).

A planning agreement may provide for a monetary contribution, land dedication, or material public benefit towards a public purpose (which is widely defined). A planning agreement may also wholly or partly exclude the application of Section 94 or Section 94A of the EP&A Act.

The planning reforms provide Crighton Properties with the opportunity to facilitate their contributions for future demands through a Voluntary Planning Agreement. The development of Crighton Properties holdings including Riverside and Myall River Downs is expected to occur over a 20 year period which is not adequately facilitated by the Great Lakes Council Contribution Plans. A Voluntary Planning Agreement (VPA) has therefore been prepared to provide appropriate contributions to the public and satisfy future development needs generated through the development of Crighton Properties holdings.

A Voluntary Planning Agreement (VPA) has been prepared jointly by Crighton Properties and Great Lakes Council (see *Annex E*) to facilitate development contributions towards a range of public facilities in the Tea Gardens locality, which is subject to approval by the Minister for Planning under Part 3A of the EP&A Act 1979. The Agreement becomes operational from the date it is signed by both parties and relates to the Part 3A application which will enable the development of 381 home sites, in addition to four super lots within the commercial precinct, as well as a range of water management devices and infrastructure provisions including a private clubhouse as part of the Project Application, and a further 599 residential home sites, 65 tourist home sites as well as a range of water management devices and infrastructure provisions including three further private clubhouse sites as part of the Concept Plan. The VPA will span the life of the project and provides flexibility in the future should the development concepts change or demands for specific public infrastructure or services fluctuate.

The specific development contributions are provided either through monetary contribution, land dedication, upgrading of street networks and/or other works in kind. The specific details of the contributions and the obligations of the signatory parties are outlined within the *Voluntary Planning Agreement* (refer to *Annex E*).

3 STATUTORY REQUIREMENTS

This chapter sets out the relevant Commonwealth, State, regional and local statutory requirements that relate to the proposal.

3.1 COMMONWEALTH LEGISLATION

3.1.1 Environmental Protection and Biodiversity Conservation Act, 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for actions that may have a significant impact on matters of national environmental significance. The EPBC Act also requires Commonwealth approval for certain actions on Commonwealth land. Matters of national environmental significance under the Act include the following:

- World Heritage Areas;
- national heritage places;
- Ramsar wetlands of international importance;
- threatened species or ecological communities listed in the EPBC Act;
- migratory species listed in the EPBC Act;
- Commonwealth marine environment; and
- nuclear actions.

From an assessment of the Riverside at Tea Gardens site it was concluded that the proposal would not have any impact on matters of national environmental significance. The site is not in a world heritage area; is not a national heritage place; does not contain Ramsar wetlands of international importance nor a Commonwealth marine environment; and the proposal is not a nuclear action nor does it have a significant impact on migratory species listed in the EPBC Act or threatened species or ecological communities listed in the EPBC Act (refer to ecological assessment in *Volume 3*). Therefore, referral to the Commonwealth Minister for the Environment is not required.

3.2 PROVISIONS OF RELEVANT STATE ACTS

3.2.1 Environmental Planning and Assessment Act 1979

The relevant state planning legislation for NSW is the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EP&A Act institutes a system of environmental planning and assessment in NSW and is administered by the Department of Planning (DoP).

The EP&A Act contains three regimes which impose requirements for planning approval:

- Part 3A provides for the assessment of development that is defined as a 'major project'; or
- Part 4 of the EP&A Act provides for the control of 'development', which requires development consent or is prohibited under an environmental planning instrument; or
- Part 5 of the EP&A Act is used where a proposal does not require development consent and its environmental impacts must be assessed as an 'activity'.

This development is declared a major project under State Environmental Planning Policy (Major Projects). The Minister for Planning is the consent authority for the project.

This Environmental Assessment report considers the likely impact of the project on the environment and has been prepared in accordance with Clause 75(F) of the EP&A Act.

Under Clause 75(R) of the EP&A Act, environmental planning instruments (EPIs) (other than State Environmental Planning Policies) do not apply to a 'Major Project'. A discussion of the applicable State Environmental Planning Policies (SEPPs) to the proposed development follows. Pursuant to clauses 75J (3) and 75O (3), the Minister may still take into account the provisions of any environmental planning instruments that may apply to the site.

Pursuant to Clause 75U of the EP&A Act, authorisation for a Part 3A approved project is not required under Part 4, section 139 or Division 8 of Part 6 of the *Heritage Act 1977*, section 87 or a consent under section 90 of the *National Parks and Wildlife Act 1974*, section 12 of the *Native Vegetation Act 2003*, Part 3A of the *Rivers and Foreshores Improvement Act 1948*, section 100B of the *Rural Fires Act 1997* and section 89, section 90 or section 91 of the *Water Management Act 2000*.

The consistency of the project to the objects of the EP&A Act is detailed in *Table 3.1*.

Table 3.1 Compliance with the relevant objects of the NSW Environmental Planning and Assessment Act 1979

Object	Proposal/Comment
To encourage:	
the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment;	The design and layout of the proposed development was determined through an overlaying process of mapping various opportunities and constraints to determine the overall building envelope and the character of the open space network. The constraints mapping identified conservation areas, specifically the Habitat Conservation Area, the SEPP 14 Wetland and the wildlife corridor which contain significant ecological communities. These areas will be largely preserved as part of this project. Community title will apply to the site, ensuring appropriate management of the public areas and facilities for the welfare of the community.
the promotion and coordination of the orderly and economic use and development of land	The proposed subdivision will be constructed and released in stages to meet residential growth demands. The design of the subdivision has maximised the use of the land in consideration of the environmental constraints of the site. The provision of residential and commercial developments within the subdivision will ensure residents have access to key services and employment.
the protection, provision and coordination of communication and utility services	Services for the subdivision will be extended off nearby existing services. The subdivision provides a variety of dwelling types (including multiple dwellings and various lot sizes), an extension of an existing adjacent commercial precinct and facilities such as community parks, open space and a clubhouse. Both passive and active recreational facilities are catered for throughout the open space and clubhouse facilities.
the provision of land for public purposes	The open space corridors and community parks proposed throughout the development provide for public use of the land. The open space areas are linked by walkways / cycleways, facilitating movement and access within and between precincts of the Riverside development and also with adjoining areas for both residents and visitors. This will provide movement paths between and within residential areas, the commercial area and other natural areas throughout the site The open space areas and the proposed clubhouse facility provide for both active and passive recreational opportunities.

Object	Proposal/Comment
the provision and coordination of community services and facilities	Riverside is well served by education and medical facilities and has access to public transport and employment areas. The development will enhance existing services and community facilities in Tea Gardens through extensions of the existing public bus route, pedestrian and cycle paths, commercial centre and the provision for home businesses. In addition to this the development will contribute to the provision of a multipurpose community function / meeting facility.
the protection of the environment, including the protection and conservation of native animal and plants, including threatened species, populations and ecological communities, and their habitats; and	The Project has identified conservation areas, specifically the Habitat Conservation Area and the SEPP 14 Wetland which contain significant ecological communities. These areas will be largely preserved as part of this project with the asset protection zone (APZs) to provide separation between the wetlands and the proposed subdivision. The wildlife corridor identified within the north portion of the site will also be managed to conserve the existing biodiversity and provide a link between the natural environments found on site. The wildlife corridor is identified on the site analysis plan submitted within Volume 2 of the EA (refer to Drawing R.C. -02).
ecologically sustainable development: • the precautionary principle; • intergenerational equity; • conservation of biological diversity and ecological integrity; and • improved valuation, pricing and incentive mechanisms.	The design and layout of the proposed development was determined through an evaluation process including the overlaying process of mapping various opportunities and constraints which identified conservation areas, specifically the Habitat Conservation Area, the SEPP 14 Wetland and the wildlife corridor which contain significant ecological communities. The layout and design of the subdivision will ensure these areas are protected, thereby minimising potential impact on these environments and conserving the values of these environments for the benefit of future generations. The proposal promotes the use of ecologically sustainable development principles by: • incorporating energy efficient subdivision design and lot size / orientation to maximise solar access; • urban design principles incorporating walkable neighbourhoods and linkages between communities; • the adoption of a total water cycle management design philosophy; • the Habitat Conservation Area and SEPP 14 wetland which will preserve significant ecological communities and provide for ecological corridors; • using engineering, architectural and other best practices to reduce development impacts; • protecting Aboriginal archaeological sites of high archaeological significance;

Object	Proposal/Comment
	• utilising existing service infrastructure; • creating opportunities for public transport usage thereby improving the efficiency of local and regional services; and • providing additional residential land to meet increasing demand.
The provision and maintenance of affordable housing	At Riverside six approaches will be implemented to encourage the provision of affordable housing, namely: • the inclusion of at least ten percent of lots less than 450 square metres, to provide housing options (substantially through the provision of duplexes); • encouraging shared use dwellings incorporating home office facilities to create affordable lifestyle opportunities; • to allow for alternative dwelling types, such as 'dual key' dwellings where areas of a dwelling can be rented out as self contained units; • allowing for an adequate supply of housing in the concept plan; • providing a subdivision design that maximises opportunities for an affordable lifestyle through the use of non motorised transport modes, accessibility of services and facilities and energy and water efficiency; and • encouraging a rental market.

3.2.2 Native Vegetation Act 2003

The *Native Vegetation Act 2003* (NV Act) commenced on 1 December 2005 and repealed the *Native Vegetation Conservation Act 1997* which previously governed the management of native vegetation in NSW.

The NV Act aims to provide flexibility and incentives for farmers to manage native vegetation, end broad scale clearing (unless it improves or maintains environmental outcomes) and encourage healthy and productive landscapes. An assessment of the proposal against the objectives of the NV Act is detailed within the Ecological Site Assessment prepared by Conacher Environmental Group (2008b), provided in *Volume 3* of the EA.

Clause 12 of the NV Act states:

"(1) Native vegetation must not be cleared except in accordance with:

(a) a development consent granted in accordance with this Act, or

(b) a property vegetation plan."

However, the NV Act does not apply to some land. Clause 5 of the NV Act states:

"(1) This Act does not apply to the following land:

(a) the land described or referred to in Part 1 of Schedule 1 (National park estate and other conservation areas),

(b) the land described or referred to in Part 2 of Schedule 1 (State forestry land),

(c) the land described or referred to in Part 3 of Schedule 1 (Urban areas)."

Urban land as defined in Part 3, Schedule 1 of the NV Act includes:

'land within a zone designated "residential" (but not "rural-residential"), "village", "township", "industrial" or "business" under an environmental planning instrument or, having regard to the purpose of the zone, having the substantial character of a zone so designated, not being land to which a property vegetation plan applies'.

Whilst the provisions of the NV Act do not apply to clearing within that part of the Riverside at Tea Gardens site zoned 2(f) – Mixed Residential-Commercial, the NV Act does apply to proposed clearing activities within the 7(a) Wetlands and Littoral Forests zone, within which a small amount of clearing is proposed in the 7(a) area to facilitate the extension of an existing drainage channel. However, section 75U(1) of the EP&A Act specifies that an authorisation referred to in section 12 of the NV Act to clear native vegetation is not required for an approved project under Part 3A of the EP&A Act.

3.2.3 Rural Fires Act 1979

The main objectives of the *Rural Fires Act 1997* are to:

- prevent, mitigate and suppress bush and other fires in NSW;
- co-ordinate bush fire fighting and bushfire prevention throughout the State;
- protect people from injury or death and property from damage as a result of bush fires; and
- protect the environment.

In accordance with section 100B(1) of the *Rural Fires Act 1997*, authorisation from the Commissioner of the NSW Rural Fire Service (RFS) is required for "*subdivision of bushfire land that could lawfully be used for residential or rural residential purposes*". This is known as a bush fire safety authority. Section 100B(2) of the Act specifies that in determining whether to provide this authorisation, the Commissioner will take into consideration the subdivision's compliance with standards regarding setbacks, provision of water supply and other matters considered by the Commissioner to be necessary to protect persons, property or the environment from danger that may arise from a bush fire.

A bush fire hazard assessment has been undertaken by Conacher Environmental Group for the Riverside at Tea Gardens site in accordance with *Planning for Bush Fire Protection* (RFS, 2006) However, it should be noted that, in accordance with section 75U of the EP&A Act, a bush fire safety authority under Section 100B of the *Rural Fires Act 1997* is not required for an approved project under Part 3A of the EP&A Act. Nevertheless, the subdivision has been designed to incorporate the recommendations of the bush fire hazard assessment in relation to asset protection zones, road design and layout, location of water supply and selection of landscaping species. The bush fire hazard assessment report has also made a number of recommendations which have been included in the statement of commitments. The bush fire hazard assessment is provided in *Volume 3*.

3.2.4 Marine Parks Act 1997

The *Marine Parks Act 1997* (MPA 1997) makes provision for the declaration of marine parks. The objects of the MPA Act are:

'*(a) to conserve marine biological diversity and marine habitats by declaring and providing for the management of a comprehensive system of marine parks,*

(b) to maintain ecological processes in marine parks,

(c) where consistent with the preceding objects:

(i) to provide for ecologically sustainable use of fish (including commercial and recreational fishing) and marine vegetation in marine parks, and

(ii) to provide opportunities for public appreciation, understanding and enjoyment of marine parks'.

The Port Stephens – Great Lakes Marine Park was declared effective from 1 December 2005. The Port Stephens – Great Lakes Marine Park (PSGLMP) covers an area of approximately 98, 000 hectares and includes offshore waters to the 3 nautical mile limit of state waters between Cape Hawk Surf Life Saving Club and Birubi Beach Surf Life Saving Club and all estuarine waters of Port Stephens and the Karuah River, the Myall River, Myall and Smiths Lakes and all of their creeks and tributaries to the line of tidal influence. Four types of zones are used within marine parks with various uses permitted within each zone. The four zones are: sanctuary zones, habitat protection zones, general use zones and special purpose zones. The Myall River adjoining the site is within the general use zone. This zone permits the widest range of commercial and recreational fishing activities. To the south of the site, in the vicinity of Wallis Island, a habitat protection zone has been identified. To the north of the site a sanctuary zone has been nominated for part of the Myall River. Most commercial and recreational fishing activities are prohibited in the sanctuary zone and limited activity is permitted in the habitat protection zone.

While the MPA 1997 does not contain specific requirements in relation to land based development the objects relate to conserving marine biological diversity and habitats. In this regard, the development of the site should not result in adverse impacts on the marine environment (this is also a requirement under SEPP 71). The key issue with respect to the proposed development and potential impact on the marine park relates to the management of stormwater drainage. Stormwater management and water quality control has been the subject of exhaustive studies to ensure negligible impacts on the marine environment. The Marine Park Authority has been consulted and advised that they had no interest in development above the Mean High Water Mark and that the existing man made water quality lake does not form part of the gazetted Port Stephens Marine Park. Stormwater management strategies are detailed in *Volume 3*.

3.2.5 Threatened Species Conservation Act, 1995

Schedules 1, 1A and 2 of the *Threatened Species Conservation Act 1995* (TSC Act) list species, populations or ecological communities of native flora and fauna considered to be threatened in New South Wales. The status of threatened species, populations or ecological communities listed in Schedules 1, 1A and 2 have been determined by a Scientific Committee as either:

- Endangered (Schedule 1);

- Critically Endangered (Schedule 1A); or
- Vulnerable (Schedule 2).

Section 5A of the EP&A Act specifies that for the purposes of the Act, and in particular the administration of sections 78A, 79B, 79C, 111 and 112 of the Act, in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats, seven factors must be taken into account along with any assessment guidelines. This assessment is referred to as the 'assessment of significance'.

Where a proposal is likely to significantly affect critical habitat of a threatened species, population or ecological community, or is in critical habitat, as defined by Part 3 of the TSC Act, a species impact statement must be prepared to accompany the development application.

Section 5A of the EP&A Act does not apply to projects assessed under Part 3A of the EP&A Act. However, an assessment of the impact of Riverside at Tea Gardens on threatened species, populations and ecological communities has been undertaken and is provided in *Volume 3*. The assessment concluded that the proposed development would not have a significant adverse impact on any threatened species, populations or ecological communities.

3.2.6 Fisheries Management Act, 1994

The *Fisheries Management Act 1994* includes provisions to declare and list threatened species of fish and marine vegetation, endangered populations and ecological communities, and key threatening processes. These provisions are similar to those in the TSC Act and must be considered when referring to section 5A of the EP&A Act. An assessment of the potential impact of the development of the Riverside at Tea Gardens on threatened aquatic fauna and their habitat has been undertaken. The assessment concluded that the proposed development would not have a significant adverse impact on any threatened species, population or ecological communities. The full report is provided in *Volume 3*.

3.2.7 Protection of the Environment Operations Act 1997

Section 55 of the *Protection of the Environment Operations Act 1997* (POEO Act) provides for the licensing of scheduled activities. Schedule 1 of the POEO Act identifies the thresholds for scheduled activities. Clause 19 of Schedule 1 identifies extractive activities as a scheduled activity if it meets the following criteria:

'Land based extractive activity	*involves the extraction, processing or storage of more than 30,000 tonnes per year of extractive materials*
Water based extractive activity	*involves the extraction of more than 30,000 cubic metres per year of extractive materials'*

Clause 19 of Schedule 1 identifies two types of extractive activities, being:

*'**land based extractive activity**, meaning the extraction, processing or storage of extractive materials, either for sale or re-use, by means of excavation, blasting, tunnelling, quarrying or other such land based methods.*

***water based extractive activity**, meaning the extraction of extractive materials, either for sale or re-use, by means of dredging or other such water-based methods.'*

Extractive materials under the POEO Act are defined as:

'clay, sand , soil, stone, gravel, rock, sandstone or similar substances that are not minerals within the meaning of the Mining Act 1992'.

The proposed extraction of material for the construction of the water detention lake, basins and ponds and the extension of an existing channel is consistent with the definition of an extractive activity under the POEO Act. However, the issuing of an Environment Protection Licence is not considered to be required nor justified in this instance based on the following:

- extracted material will not be sold for economic gain. The majority of the extracted material will be subject to reuse throughout the site for filling and shaping in areas where fill material is required, for the construction of the east / west drainage branch, diversion bank, earth mounds for noise mitigation, and shaping of landscaped areas;

- a small quantity of excess topsoil generated, approximately 38,000m^3 (after on site filling and shaping) will be stockpiled for future use by Great Lakes Council on the site of the future sporting complex located on the western side of Myall Street subject to availability. The future sporting complex site will be dedicated to Great Lakes Council and developed into a valuable community asset to meet the needs of the future population of Tea Gardens. The dedication of the sporting complex to Great Lakes Council (Council) is a condition of the draft Voluntary Planning Agreement between Crighton Properties and Council which will ensure the provision of appropriate recreational facilities. The topsoil referred to above has been offered to Great Lakes Council for its use on the recreational field site free of charge, subject to availability; and

- construction works associated with the water detention lake, basins and ponds and the extension of an existing channel will be limited to Stage 1 of the Riverside at Tea Gardens development and will not be an ongoing activity. The timeframe for construction of these water management devices and is estimated to be between four and 26 weeks.

Given the short term nature of the proposed extractive activities, the end use of the material being for disposal / dispersal for works associated with the Riverside at Tea Gardens development and in light of the material not being sold, extractive activities associated with the construction of the water detention lake, basins and ponds and the extension of an existing channel are not considered to be activities for which an Environment Protection Licence

should be required. The potential environmental impacts associated with the construction activities will be managed in accordance with the Construction Environmental Management Plan for the Riverside at Tea Gardens development as detailed in *Volume 3* of the EA (ERM, 2009).

3.3 STATE PLANNING POLICIES, LEGISLATION AND GUIDELINES

3.3.1 State Environmental Planning Policy (Major Projects) 2005

State Environmental Planning Policy (Major Projects) 2005 (SEPP (Major Projects)) is the principal instrument for nominating projects to be determined by the Minister for Planning under Part 3A of the EP&A Act. Clause 6 of SEPP (Major Projects) identifies Part 3A projects, which includes a project:

"*(a) that is described in Schedule 1 or 2…"*

Schedule 2 Clause 1(i) includes *"subdivision of land in a residential zone into more than 25 lots …"*in the coastal area. The concept plan for the proposed development provides for more than 900 lots and the project plan creates 348 lots in the coastal area, and therefore Part 3A of the EP&A Act applies. In accordance with section 75D of the EP&A Act approval from the Minister for Planning is required for a development which has been declared to be a project under Part 3A of the EP&A Act.

The Minister has confirmed that the development of the Riverside at Tea Gardens site is considered to be a major project under Part 3A of the EP&A Act as specified in the Major Projects SEPP.

3.3.2 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy No 11 – Traffic Generating Development (SEPP 11) was repealed on the 1st January 2008. The planning provisions previously within SEPP 11 have been updated and incorporated into *State Environmental Planning Policy (Infrastructure) 2007*, which came into effect on the 1st January 2008. Schedule 3 of the Infrastructure SEPP outlines the planning requirements for traffic generating development and identifies the following requirements for the subdivision of land based on size and / or capacity:

- site with access to any road: *200 or more allotments where the subdivision includes the opening of a public road*; or
- site with access to a classified road or to a road that connects to a classified road (if access within 90m of connection, measured along alignment of connecting road): *50 or more allotments.*

The Riverside at Tea Gardens development will result in the creation of greater than 200 allotments and will include the construction and dedication of public roads to service the development. The provisions of the Infrastructure SEPP therefore apply to the development and in accordance with Clause 104 of the Infrastructure SEPP, the application is required to be referred to the NSW Roads and Traffic Authority. A Traffic Impact Assessment has been undertaken for the development and is located within *Volume 3*.

3.3.3 State Environmental Planning Policy No 14 – Coastal Wetlands (SEPP 14)

State Environmental Planning Policy No 14 (SEPP 14) – Coastal Wetland No. 746 adjoins the Myall River within the eastern portion of the Riverside at Tea Gardens site. The aim of SEPP 14 is to :

'*ensure that the coastal wetlands are preserved and protected in the environmental and economic interests of the State.*'

SEPP 14 Wetland No 746 will be preserved and protected as a result of the proposed Riverside at Tea Gardens development. The significant ecological communities and value of the SEPP 14 wetlands, including facilitating wildlife movement will not be impacted.

Clause 7(1) of SEPP 14 states that:

"*(1) In respect of land to which this policy applies, a person shall not:*

(a) clear that land,

(b) construct a levee on that land,

(c) drain that land, or

(d) fill that land,

except with the consent of the council and the concurrence of the Director."

Clearing includes tree removal, lopping and lower storey native vegetation removal (i.e. underscrubbing). Development consent is required for such works under SEPP 14, with the exception of Part 3A applications.

Limited works associated with the extension of an existing drainage connected to the Myall River are proposed. These works are largely within land zoned 2(f), with a small section within land zoned 7(a). These works are permissible with development consent within these zones. No development is proposed within the SEPP 14 Wetland.

Clause 7(2) of SEPP 14 states that:

"*(2) In considering whether to grant concurrence under subclause (1), the Director shall take into consideration:*

(a) the environmental effects of the proposed development, including the effect of the proposed development on:

(i) the growth of native plant communities,

(ii) the survival of native wildlife populations,

(iii) the provision and quality of habitats for both indigenous and migratory species,

(iv) the surface and groundwater characteristics of the site on which the development is proposed to be carried out and of the surrounding area, including salinity and water quality,

(b) whether adequate safeguards and rehabilitation measures have been, or will be, made to protect the environment,

(c) whether carrying out the development would be consistent with the aim of this policy,

(d) the objectives and major goals of the "National Conservation Strategy for Australia" (as set forth in the second edition of a paper prepared by the Commonwealth Department of Home Affairs and Environment for comment at the National Conference on Conservation held in June, 1983, and published in 1984 by the Australian Government Publishing Service) in so far as they relate to wetlands and the conservation of "living resources" generally, copies of which are deposited in the office of the Department,

(e) whether consideration has been given to establish whether any feasible alternatives exist to the carrying out of the proposed development (either on other land or by other methods) and if so, the reasons given for choosing the proposed development,

(f) any representations made by the Director of National Parks and Wildlife in relation to the development application, and

(g) any wetlands surrounding the land to which the development application relates and appropriateness of imposing conditions requiring the carrying out of works to preserve or enhance the value of those surrounding wetlands."

An assessment of the impacts of the proposed channel extension works on the adjacent SEPP 14 Wetland and surrounding environment has been undertaken by Winning (2009) and is detailed within the Ecological Site Assessment (Conacher Environmental Group, 2008b) (refer to *Volume 3* of the EA) and summarised in *Sections 4.5* and *4.12* respectively.

No development is proposed within the 7(a) Wetland and Littoral Rainforest or 7(b) Conservation zones with the exception of a small area of clearing within the 7(a) zone for the channel extension. These works are outside of the SEPP 14 Wetland. 13 residential lots and a community facility including a clubhouse and surrounding active and passive recreational areas forming part

of Precinct 1 are located immediately adjacent to the 7(b) Conservation zone. The proposed development therefore is located within a sensitive coastal location and the environmental impacts to the SEPP 14 Wetland have been addressed within this EA.

The value of wetlands was assessed as part of the *Coastal Wetlands of NSW: A Survey and Report Prepared for the Coastal Council of NSW* (1985). This report identified a number of attributes and values of wetlands within NSW, including:

- functional attributes, including:
  - productivity;
  - nutrient recycling;
  - hydrological and geomorphological functions;
- provision of habitat;
- genetic diversity;
- recreational value;
- educational value;
- scientific value; and
- aesthetic value.

SEPP 14 wetlands allow for the continued growth of native plant communities and the provision of habitat for native species and populations within the intertidal estuarine environment. The SEPP 14 wetland adjacent to the Riverside at Tea Gardens development contains the attributes and values as identified in the *Coastal Wetlands of NSW* study (Coastal Council of NSW), including significant ecological communities, facilitation of habitats and corridor linkages. The SEPP 14 Wetland will be fully preserved as a result of the proposed Riverside at Tea Gardens development.

3.3.4 State Environmental Planning Policy No 44 - Koala Habitat Protection (SEPP 44)

SEPP 44 encourages the proper conservation and management of areas of vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline.

Core koala habitat is defined as *"…an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population."* If a site is identified

as a core koala habitat a Koala Plan of Management must be prepared for the site before development consent may be granted. The SEPP does not specify that a Koala Plan of Management would be required for Part 3A Projects.

Specialist surveys for the Koala have been undertaken as part of the environmental assessment of the site (see *Volume 3*). The study found that the proposal was unlikely to impact on koalas in the Hawks Nest/Tea Gardens locality.

3.3.5 State Environmental Planning Policy No 50 – Canal Estate Development (SEPP 50)

SEPP 50 prohibits canal estate development as defined in the Policy. Clause 3 defines canal estate development as development that:

"*(a) incorporates wholly or in part a constructed canal, or other waterway or waterbody, that is inundated by or drains to a natural waterway or natural waterbody by surface water or groundwater movement (not being works of drainage, or for the supply or treatment of water, that are constructed by or with the authority of a person or body responsible for those functions and that are limited to the minimal reasonable size and capacity to meet a demonstrated need for the works), and*

(b) includes the construction of dwellings (which may include tourist accommodation) of a kind other than, or in addition to:

(i) dwellings that are permitted on rural land, and

(ii) dwellings that are used for caretaker or staff purposes, and

(c) requires the use of a sufficient depth of fill material to raise the level of all or part of that land on which the dwellings are (or are proposed to be) located in order to comply with requirements relating to residential development on flood prone land."

Canal estate development does not include drainage works that are *'limited to the minimal reasonable size and capacity to meet a demonstrated need for the works'*.

Several different water management options have been explored for the site and a preferred scheme involving the extension of the existing detention lake and the creation of three separated freshwater basins, in addition to a number of separate smaller water quality control ponds and basins, has been adopted as essential elements in the water treatment train.

Crighton Properties has obtained a legal opinion from Malcolm G. Craig, Q.C. regarding the applicability of SEPP 50 to the original proposed water management system. Mr Craig's opinion is that the proposed extension of the existing detention lake would not represent a canal estate development within the meaning of clause 3 of SEPP 50 and therefore would not be classified as a

prohibited development. This legal opinion is provided at *Annex G* of *Volume 1* of the EA.

Subsequent to the legal opinion obtained from Malcolm G. Craig, Q.C. the proposed water management system was revised from a singular integrated 6.0 hectare extension of the existing lake to present an extension of the existing detention lake by 2.0 ha and inclusion of three (3) separate freshwater detention ponds to cater for water quality management. The revised design of the water treatment system has been sized to the minimal reasonable size and capacity to meet drainage needs. The inclusion of the separate freshwater detention ponds has further addressed the requirements of SEPP 50 by no longer proposing drainage to flow directly to a natural waterway or natural water body. The proposed water management strategy is detailed in *Volume 3*.

3.3.6 State Environmental Planning Policy No 71 – Coastal Protection (SEPP 71)

State Environmental Planning Policy 71 – Coastal Protection (SEPP 71) aims to ensure that development in the NSW Coastal Zone is appropriate and suitably located and that there is a consistent and strategic approach to coastal planning and management. It provides a clear development assessment framework for the coastal zone.

The Riverside at Tea Gardens site is within the coastal zone. The parts of the site that are within 100 metres of the Myall River, the Port Stephens-Great Lakes Marine Park and within the SEPP 14 Wetland are defined as 'sensitive coastal locations' under SEPP 71. Part of this development occurs within Precinct 1 which proposes 13 residential allotments and associated community facilities within a sensitive coastal location, as well as the proposed channel extension works. The channel extension works are located mostly within land zoned 2(f) Mixed Residential - Commercial and partly within land zoned 7(a) Wetlands and Littoral Rainforest. The works are within 100m of the Myall River, Great Lakes Marine Park and the SEPP 14 Wetland. The proposed drainage works are permissible with consent within both the Residential 2(f) and 7(a) Wetland zones.

Part 2, clause 7(a) of SEPP 71 specifies the matters that should be taken into consideration by a council when it prepares a draft local environmental plan and when a consent authority determines a development application to carry out development on land to which the SEPP applies. *Table 3.2* identifies the aims and matters for consideration under SEPP 71 and are considered with respect to the Riverside at Tea Gardens development. Part 3 of SEPP 71 relating to significant coastal development applies to the development as the proposal involves development within 100 metres below mean high water mark of the Myall River and development is proposed within land to which SEPP 14 applies.

Part 4 relates to development control on land to which the SEPP applies and contains the following provisions:

- Flexible zone provisions of an environmental planning instrument are not to apply to development within the coastal zone.

  The proposed development is not relying on flexible zone provisions and is permissible with consent within the existing 2(f), 7(a) and 7(b) zones.

- Public access is not to be impeded or diminished to or along the coastal foreshore.

  The proposed development will not affect public access to the foreshore. There is no existing right of access over the site.

- Effluent is not to be disposed of by a non-reticulated system if it is likely to have a negative effect on the water quality of the sea or any nearby beach, or an estuary, a coastal lake, a coastal creek or other similar body of water, or a rock platform.

  Effluent is to be disposed of by way of a reticulated system.

- Untreated stormwater is not to be discharged into the sea or other coastal waterbody or onto a rock platform.

  Untreated stormwater will not be discharged to the Myall River. *Sections 4.3* and *4.4* detail the proposed management of stormwater associated with the development.

Part 5 relates to master plans. Clause 18 specifies that a consent authority must not grant consent for certain forms of subdivision within the coastal zone unless the Minister for Planning has adopted a master plan for the land. The proposed subdivision of the site would normally require the preparation of a master plan. However, Section 75M(4) of the EP&A Act provides that where an environmental planning instrument requires the preparation of a development control plan before a specified development may be carried out on the land, then that obligation may be satisfied by the submission and approval of a concept plan. Advice from the Department of Planning is that 'master plans' are now considered 'development control plans' so that an approved concept plan for the site will satisfy the provisions of SEPP 71 in this regard.

Table 3.2 SEPP 71 Aims and Matters for Consideration

Consideration	Comments
Part 1 Clause 2 – Aims of SEPP 71	
a) to protect and manage the natural, cultural, recreational and economic attributes of the New South Wales coast.	The development of the site for urban purposes would enhance the cultural and economic attributes of the Tea Gardens / Hawks Nest area through the appropriate provision of housing and commercial facilities. Substantial areas of the 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 7(a) and 7(b) zones.
b) to protect and improve existing public access to and along coastal foreshores to the extent that this is compatible with the natural attributes of the coastal foreshore.	The development of the site for residential and commercial purposes would not have an impact on public access to and along the foreshore as there is no existing legal access over the property. The land adjoining the Myall River is zoned for environmental protection and is not proposed for development. The future residential subdivision and tourist development may assist in improving access to the Myall River.
c) to ensure that new opportunities for public access to and along coastal foreshores are identified and realised to the extent that this is compatible with the natural attributes of the coastal foreshore.	Refer to above comments.
d) to protect and preserve Aboriginal cultural heritage, and Aboriginal places, values, customs, beliefs and traditional knowledge.	An archaeological assessment of the site was undertaken in 1991. The assessment identified two archaeological sites. A Consent to Destroy permit was issued by the National Parks & Wildlife Service for one site. The second site is located within the SEPP 14 wetlands and will not be disturbed by the proposed development.
e) to ensure that the visual amenity of the coast is protected.	The expected visual impacts associated with the use of the site for urban purposes on the amenity of the coast are expected to be negligible. Refer to *Section 3.9* for the visual impact assessment.

Consideration	Comments
f) to protect and preserve beach environments and beach amenity.	The development site is not in proximity to a beach.
g) to protect and preserve native coastal vegetation.	The impacts of the development of the site on coastal vegetation are documented in *Volume 3*. Native coastal vegetation will be protected and preserved where practicable.
h) to protect and preserve the marine environment of New South Wales.	Appropriate stormwater management measures are proposed to minimise impacts on receiving environments.
i) to protect and preserve rock platforms.	No rock platforms are located within the vicinity of the site.
j) to manage the coastal zone in accordance with the principles of ecologically sustainable development (within the meaning of section 6(2) of the *Protection of the Environment Administration Act 1991*). The principles of ecological sustainable development are: i) precautionary principle; ii) intergenerational equity; iii) conservation of biological diversity and ecological integrity; and iv) improved valuation, pricing and incentive mechanisms	The proposed development seeks to maximise the site's potential whilst at the same time protecting its environmentally sensitive areas. The proposal promotes the use of ecologically sustainable development principles by: • incorporating energy efficient subdivision design and lot sizing and orientation to maximise solar access; • urban design principles incorporating walkable neighbourhoods and linkages between communities; • the adoption of a total water cycle management design philosophy; • the Habitat Conservation Area and SEPP 14 wetland which will preserve significant ecological communities and provide for ecological corridors to ensure that the ecological values of the site are conserved for the future; • using engineering, architectural and other best practices to reduce development impacts; • protecting Aboriginal archaeological sites of high archaeological significance; • utilising existing service infrastructure; • creating opportunities for public transport usage thereby improving the efficiency of local and regional services; and • providing additional residential land to meet increasing demand within the constraints of the site, as detailed in *Section 2.1*..

Consideration	Comments
k) to ensure that the type, bulk, scale and size of development is appropriate for the location and protects and improves the natural scenic quality of the surrounding area.	Architectural guidelines have been prepared to ensure that the natural and scenic quality of the area is protected. The proponent has conducted design forums with the community as part of the preparation of the guidelines.
l) to encourage a strategic approach to coastal management.	The site is identified in Council's Conservation and Development Strategy as suitable for residential development.
Part 2 Clause 8 – Matters for Consideration	
(b) existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and, where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved.	There is no existing public access to the foreshore for pedestrians or persons with a disability. Access could be provided to the proposed conference/clubhouse facility and boat berthing basin at the north east corner of the site.
(c) opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability.	Opportunities to provide public access to the foreshore for pedestrians would be problematic given the wetlands in this area, however the project proposes the construction of footpaths adjacent to the wetland buffer land and the Foreshore Park within the northern portion of the site to facilitate access to the foreshore areas, whilst ensuring appropriate protection of areas of ecological value.
(d) the suitability of development given its type, location and design and its relationship with the surrounding area.	A number of environmental assessments have been carried out over the site that have identified the site's opportunities and constraints as detailed within *Section 2.1*. The proposed development is an extension of the existing Riverside Estate and will complement existing development in the area.
(e) any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore.	The development of the site for residential and commercial purposes is a sufficient distance from the Myall River and of a low scale such that it would not affect the amenity of the coastal foreshore.

Consideration	Comments
(f) the scenic qualities of the New South Wales coast, and means to protect and improve these qualities.	The expected visual impacts associated with the use of the site for residential and commercial purposes have been assessed and are considered to be minor.
(g) measures to conserve animals (within the meaning of the *Threatened Species Conservation Act 1995*) and plants (within the meaning of that Act), and their habitats.	The impacts of the proposed development on flora and fauna are addressed in *Section 4.12*. The Ecological Impact Assessment (including threatened species assessment) is provided in *Volume 3* of the EA.
(h) measures to conserve fish (within the meaning of Part 7A of the *Fisheries Management Act 1994*) and marine vegetation (within the meaning of that Part), and their habitats.	The proposed development will not impact on fish and marine vegetation. Refer to the ecological assessment and stormwater management assessment contained in *Volume 3*.
(i) existing wildlife corridors and the impact of development on these corridors.	Refer to the ecological assessment in *Volume 3*. The proposal will not impact on identified wildlife corridors and incorporates corridors to link into the existing system.
(j) the likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards.	The site is not affected by coastal processes or hazards.
(k) measures to reduce the potential for conflict between land-based and water-based coastal activities.	The proposal would not result in any conflict between land-based and water-based coastal activities as the proposed development is located a sufficient distance from the coastal foreshore.
(l) measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals.	The proposal will not impact on any known cultural places, values, customs, beliefs or traditional knowledge of Aboriginal people.
(m) likely impacts of development on the water quality of coastal waterbodies.	The likely impacts associated with the proposed use of the site for residential and commercial purposes on the quality of ground and surface water has been assessed and considered to be acceptable. Refer to *Sections 3.2* and *3.6*.

Consideration	Comments
(n) the conservation and preservation of items of heritage, archaeological or historic significance.	No items of archaeological or historic significance will be impacted by the proposed development. Refer to cultural heritage assessment in *Volume 3*.
(o) only in cases in which a council prepares a draft local environmental plan that applies to land to which this Policy applies, the means to encourage compact towns and cities.	Not applicable to this site.
(p) only in cases in which a development application in relation to proposed development is determined:	
(i) the cumulative impacts of the proposed development on the environment.	The cumulative impact of the concept plan and project application of the proposal on the environment is set out in Chapter 4. The assessment has concluded that the proposal will have acceptable impacts on the environment.
(ii) measures to ensure that water and energy usage by the proposed development is efficient.	Residential development on the site will comply with BASIX requirements.

3.3.7 New South Wales Coastal Policy 1997

The *NSW Coastal Policy 1997* is a guide for land use decision making in the designated coastal zone. It recognises that the coast is the focus of intense pressures from human activity and that there is a large range of competing interests for its resources. A decision making approach based on ecologically sustainable development seeks to reconcile these competing interests. The *NSW Coastal Policy 1997* aims to:

- protect, rehabilitate and improve the natural environment;
- protect and conserve cultural heritage;
- provide for public access and use;
- recognise and accommodate natural processes;
- provide for ecologically sustainable development and use of resources;
- provide information to enable effective management;
- protect and enhance aesthetic qualities;
- provide for ecologically sustainable human settlement; and
- integrate planning and management.

The *NSW Coastal Policy 1997* discourages the development of land with high conservation value or other constraints where development would not be consistent with the aims of the policy. The aims of the Policy are similar to those of SEPP 71. The proposal is consistent with the aims, principles and goals of the *NSW Coastal Policy 1997*, as detailed in *Table 1* within *Annex H* of *Volume 1*.

3.3.8 Coastal Design Guidelines for NSW

The *Coastal Design Guidelines for NSW* was produced in 2003 by the NSW Coastal Council. The document is designed to provide a framework for discussion and decision making involving coastal planning, design and development proposals between all stakeholders in the context of caring for the natural beauty and amenity of coastal beaches, headlands, waterways and ecologies upstream.

Part 1 of the Guidelines defines seven coastal settlement types which can be used to analyse and understand urban development along the NSW coast. Part 2 of the Guidelines identifies five principles for coastal settlement structure. These principles and their elements are presented as best practice outcomes and form the basis for understanding, debating and designing the

present and future form of coastal settlements in NSW. The five principles for coastal settlement structure are:

- defining the footprint and boundary of the settlement;
- connecting open space;
- protecting natural edges;
- reinforcing the street pattern; and
- appropriate buildings in a coastal context.

The concept plan incorporates these principles into its design. The design guidelines are discussed in relation to the Project Application in the urban design and site analysis section in *Chapter 2*. The proposed development's consistency to the *Coastal Design Guidelines for NSW* is detailed in *Table 2* within *Annex H* of *Volume 1*.

3.4 REGIONAL PLANNING INSTRUMENTS, STRATEGIES AND STUDIES

3.4.1 Hunter Regional Environmental Plan 1989

The *Hunter Regional Environmental Plan 1989* (HREP) is the principal regional planning instrument applying to the Hunter region, including the Great Lakes Local Government Area. The main aims of the HREP are to promote the balanced development of the Hunter region, to encourage orderly and economic development and to bring about optimum use of land and other resources consistent with the needs and aspirations of the local community. Clauses relevant to the Riverside at Tea Gardens site are summarised below.

Housing

Clause 8 of the HREP relates to housing. The plan states that a variety of housing types and tenures that are affordable should be provided throughout the region and the design and siting of housing should meet community needs and minimise impacts on the environment. Clause 9 of the HREP also states that adequate and affordable health, education and community facilities should be provided to support residential areas.

Commercial or Retail Uses

Clause 18 of the HREP relates to commercial development, it states:

"The objectives of this plan in relation to planning strategies concerning commercial development are:

(a) to ensure that commercial service centres are developed to suit the convenience of consumers and to optimise public and private investment, and

(b) to promote the distribution of employment in the tertiary sector in a manner compatible with the distribution of population."

Tourism

Clause 21 of the HREP outlines the objectives of the policy in relation to tourism. The plan states that incentives and flexibility should be provided to encourage tourism and plans prepared by Tourism NSW be considered in relation to tourism development in the region.

Urban Land

Clause 29 of the HREP relates to urban land. It states that sufficient amounts of urban land should be provided to meet anticipated growth in an orderly and efficient manner. Natural constraints, urban capability, supply and demand for urban land, availability and costs of public services, access to employment, commercial and community facilities and the provision in choice of housing and location should all be taken into consideration when planning new urban areas.

Soil, Water and Forest Resources

Clause 42 outlines the objectives of the HREP in relation to soil, water and forest resources and states:

"The objective of this plan in relation to planning strategies concerning soil, water and forest resources is to manage the resources of the region in a co-ordinated manner so as to sustain their productivity and condition, and so as to meet community needs while ensuring that adverse impacts on the environment and the population likely to be affected are minimised."

Pollution Control

Clause 45 relates to pollution control and states:

"The objective of this plan in relation to planning strategies concerning pollution control is to control development so as to minimise air, noise and water pollution."

Environmental Hazards

Part 7, Division 3 of the HREP relates to environmental hazards and it identifies that erosion, landslip, flooding, coastal erosion, storm damage and bushfire should be taken into account when identifying areas for development.

Natural Areas

Part 8, Division 1 of the HREP relates to natural areas and their conservation, management and protection. It states that wetlands, forests, water catchment areas, scenic and historic landscapes, foreshores and wildlife habitats should be included in rural environmental protection zones.

Recreation

Part 8, Division 2 of the HREP refers to recreation and states that a wide range of recreation and leisure opportunities should be provided. It also implies that compatible recreation and nature conservation activities should be encouraged and that public access to natural areas should be improved.

Comment

The Concept Plan for Riverside at Tea Gardens shows the site ultimately being developed for a range of uses including residential, commercial and tourist development. The project is consistent with the aims, objectives and relevant clauses of the HREP. The potential environmental impacts of the proposal will be minimised, particularly with respect to implementing strategies concerning water quality and soil erosion management. This is discussed in greater detail in *Chapter 4*.

3.4.2 Draft Mid North Coast Regional Strategy

The *Draft Mid North Coast Regional Strategy* (MNCRS) was placed on exhibition by the Department of Planning on 19 January 2007. Once finalised, it will guide local planning in the eight local government areas of Clarence Valley, Coffs Harbour, Bellingen, Nambucca, Kempsey, Port Macquarie–Hastings, Greater Taree and Great Lakes.

Tea Gardens / Hawks Nest is at the southern end of the area included in the MNCRS and are identified as 'towns' that serve a limited catchment and have a small to medium scale concentration of retail, health and other services with lower density residential. They were recognised as relying on major regional centres and major towns for high order services, retailing and employment.

The waters adjacent to Tea Gardens / Hawks Nest are identified as 'Marine Park / Protection' in the MNCRS. The Concept Plan and project Application include water management measures to ensure that quality of surface and ground water is not reduced. The Concept Plan and Project Application also include a buffer to the wetland, to protect its function and value.

The Mid North Coast is recognised as one of the fastest and most consistent growth areas of NSW. It recognised the growing pressure for urban development in the Great Lakes and greater Taree areas, with recent road upgrades and development activity suggesting that "…*these areas will experience revitalised in-migration and population growth*" (DoP, 2007).

The 'strategy at a glance' aims to, amongst other objectives:

- *"cater for a housing demand of up to 58,400 new dwellings by 2031 to accommodate the forecast population increase of 91, 000 and any anticipated growth beyond this figure arising from increased development pressures in the southern part of the Region"*; and

- *"ensure that new housing meets the needs of smaller households and an ageing population by encouraging a shift in dwelling mix and type so that 60 percent of new housing will be in Greenfield location and 40 percent in existing urban areas"* (DoP, 2007).

It states that the demand to live near the coast will continue to result in the majority of the anticipated growth being accommodated in existing identified growth areas, including Tea Gardens – Hawks Nest.

The MNCRS sets out neighbourhood planning principles that include:

- *"A range of land uses to provide the right mix of housing, jobs, open space, recreational space and green space;*

- *Easy access to major centres with a full range of shops, recreational facilities and services along with smaller village centres and neighbourhood shops;*

- *Jobs available locally and regionally, reducing travel times and the demand for transport services;*

- *Street and suburbs planned so that residents can walk to shops for their daily needs;*

- *A wide range of housing choices to provide for different needs and incomes. Traditional houses on their own block will be available along with smaller lower maintenance homes, units and terraces for older people and young single or couples; and*

- *Conservation land in and around development sites to help protect biodiversity and provide open space for recreation"* (DoP, 2007).

The concept plan and project application meets the aims of the MNCRS and the adopts the planning principles through its creation of a greenfield development with a range of lot sizes to accommodate different housing types that are linked by an open space network that retains wildlife corridors and buffers to the wetlands. The residential lots also provide for home based business which allows people to work at home, thereby reducing the need to travel and providing employment diversity in the Tea Gardens - Hawks Nest area.

The residential lots are close to a range of commercial, community and retail services in the new town centre at the corner of Myall Street and Shoreline Drive. The town centre can be accessed from the residential area within Riverside, by the internal streets or by pedestrian and cycle paths located in the open space network.

The *draft Mid North Coast Regional Strategy* includes Sustainability Criteria against which new proposals are to be assessed against. An assessment of the Riverside at Tea Gardens development against the Sustainability Criteria has been undertaken and is detailed in *Annex H* of *Volume 1*.

3.5 LOCAL PLANNING INSTRUMENTS, POLICIES, STRATEGIES AND STUDIES

3.5.1 Great Lakes Local Environmental Plan 1996

Great Lakes Local Environmental Plan 1996 (Great Lakes LEP) is the principal local environmental planning instrument governing land use within the Great Lakes local government area (LGA).

Zones

The majority of the Riverside at Tea Gardens site is zoned Residential 2(f) – Mixed Residential-Commercial. However part of it is also zoned Environmental Protection 7(a) Wetlands and Littoral Rainforest and 7(b) Conservation. *Figure 3.1* details the zoning of the site.

2(f) – Mixed Residential-Commercial Zone

The objectives of the Residential 2(f) – Mixed Residential-Commercial zone are as follows:

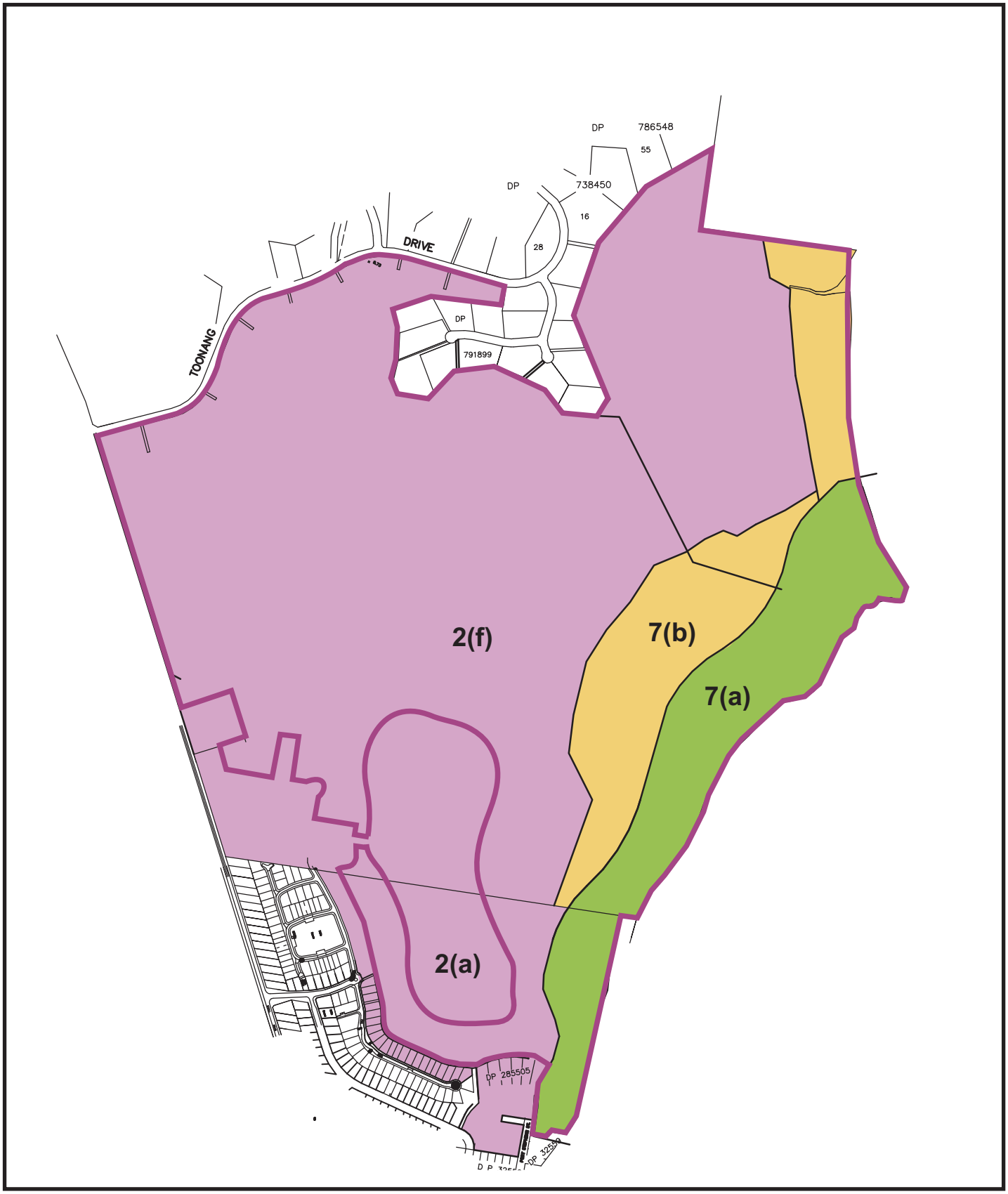
"(a) to enable mixed development comprised of accommodation for tourists and permanent residents generally not exceeding two storeys in height, and

(b) to provide for recreational, retail and commercial uses and a limited range of other uses which:

(i) are complementary with a residential environment, and

(ii) are unlikely to place demands on services beyond the level reasonably required for residential uses."

Exempt development in the 2(f) – Mixed Residential-Commercial zone includes hazard reduction measures; dwelling-houses; family day care homes and home occupations. Prohibited development within the zone includes abattoirs; aerodromes; animal establishments; bulky goods salesrooms or showrooms; extractive industries; hazardous storage establishments; heliports; industries; institutions; intensive agriculture; materials recycling



Legend

Riverside at Tea Gardens Site Boundary

Great Lakes Draft Amendment No.44 LEP 1996

- 2(a) Low Density Residential
- 2(f) Mixed Residential/Commercial
- 7(a) Wetlands Zone
- 7(b) Conservation Zone

Figure 3.1

Existing Zoning Plan Riverside at Tea Gardens

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_river_aug_12		
Date:	20/08/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Great Lakes Draft Amendment No.44 LEP 1996		
Scale:	Refer to Scale Bar		

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yards; offensive storage establishments; plant hire; sawmills; shops; stock and sale yards; transport depots; transport terminals; vehicle body repair workshops; vehicle repair stations and warehouses. All other development is permitted with consent.

Comment

The Riverside at Tea Gardens development provides a mix of tourist and residential development supported by retail / commercial and recreational facilities. Low density tourist accommodation is proposed north of Precinct 2 within the north-eastern portion of the site. The permanent residential component generally includes two storey dwellings which complements the low density coastal community profile of the Tea Gardens and Hawks Nest area.

The proposed development provides both passive and active recreational areas. Active recreational facilities are proposed within the Myall River Downs site as part of the required Section 94 Contributions for Riverside, with agreed contributions toward the embellishment of facilities. The community clubhouse proposed within Precinct 1, as shown in the architectural drawings R.C.-32 to R.C. – 35 (refer to *Volume 2*) identify a swimming pool, gymnasium, tennis court and outdoor children's play area.

The open space networks which link the precincts provides for passive recreation with pedestrian pathways and grassed open areas. The recreation areas provided have been designed to complement the predicted future residential and tourist population which has been assessed by Duo Consulting (2008) within their social impact assessment detailed within *Sections 5.4.5*. and *5.4.6* provided within *Volume 3* of the EA. The open space areas will be managed within a community title scheme. The recreation area proposed within the Myall River Downs site will be dedicated to Council as a community facility as agreed within the Voluntary Planning Agreement (VPA) (refer to *Section 2.13*).

As the proposed development does not incorporate a golf course as originally identified within DCP 22, the residential component has been increased to better align with the density requirements envisaged within Council's revised draft Housing Strategy (PB, 2006). This increase in residential development has required an increase in retail and commercial development within the commercial hub proposed in Precinct 1. The retail and commercial development can no longer seek to meet the daily convenience needs of the residents but needs to provide for employment and business development to support future residents. The Riverside at Tea Gardens development aims to contribute to the provision of services including upgrades to the existing road networks and the development of water, sewerage, electricity and telecommunication services in consultation with the relevant service providers.

It is estimated that:

- residential consumption activities will directly contribute an estimated $17.9 million per annum to the local economy base, which will support an estimated 107 equivalent full time jobs in the local area when complete; and

- jobs associated with the day to day operation of the site and ongoing capital maintenance will be created. For Riverside this is estimated to equate to $2,115,000 to $4,230,000, which represents ten additional full-time direct jobs and 53 jobs overall (direct and indirect) (PB, 2007).

In response to growth anticipated in the local economy base, the retail and commercial centre has been increased. Furthermore the geographical location of surrounding retail centres has also been considered.

Section 5.5 identifies that Hawks Nest and Tea Gardens are geographically isolated with respect to access to existing retail and commercial development. Raymond Terrace is the closest retail centre (52km from Riverside) followed by Newcastle. The social assessment indicates that 52km is a significant distance to travel to a retail centre especially when Riverside at Tea Gardens is attempting to create a community character with home-based businesses, employment and the inclusion of local primary, secondary and tertiary facilities. Therefore the development of the retail and commercial centre has been designed to provide for the Riverside residential community and support the projected future populations of the Tea Gardens and Hawks Nest area envisaged within Council's revised draft Housing Strategy.

The proposal also includes extension of an existing drainage channel which is linked to the Myall River. The proposed channel works are located largely within the 2(f) – Mixed Residential – Commercial zone. This is permissible with consent within the 2(f) zone. The works will facilitate integrated water management across the Riverside site, thereby ensuring tidal flushing of the water management lake.

Development proposed within the 2(f) – Mixed Residential-Commercial zone is consistent with the objectives of the zone

7(a) Wetlands and Littoral Rainforest Zone

The objective of the Environmental Protection 7(a) Wetlands and Littoral Rainforest zone is:

"...to restrict the type and scale of development to that which is compatible with the special ecological or scientific values of coastal wetlands and littoral rainforests and which is unlikely to:

(a) have a significant detrimental effect on the growth of native plant communities, or

(b) adversely affect the survival of native wildlife populations, or

(c) adversely affect the provision and quality of habitats for either indigenous or migratory species."

No development is permitted without consent in the 7(a) Wetlands and Littoral Rainforest zone. Development for the purpose of agriculture; aquaculture, bushfire hazard reduction; dwelling-houses; recreation areas; roads; utility installations and works for drainage purposes are permitted with consent. All other development is prohibited.

Comment

Development proposed within the 7(a) Wetlands and Littoral Rainforest zone, is limited to a small area associated with the extension of the existing channel which is connected to the Myall River. The extension of the channel is required in order to facilitate tidal flushing and drainage of the existing detention lake. The removal of vegetation to facilitate the drainage works is assessed by Winning (2009) (refer to *Volume 3*).

No other development is proposed within the 7(a) Wetland zone, thereby ensuring that the SEPP 14 Wetland is preserved, and thus allowing for the continued growth of native plant communities and the provision of habitat for native species and populations.

The Riverside site is largely disturbed due to its previous use as agricultural grazing lands. A site analysis was undertaken which identified remnant vegetation along the northern boundary of the site adjoining the 7(a) and 7(b) wetland zones. The Riverside at Tea Gardens development has been designed to include a wildlife corridor linking the wetland zone to the existing significant vegetation located along the northern boundary of the site. This link will allow native wildlife to migrate between the two habitat zones with minimal interaction with surrounding development.

Development proposed adjacent to the SEPP 14 Wetland involves the extension of an existing drainage channel to facilitate water management at the site. The SEPP 14 Wetland will not be directly impacted by the proposed development. Potential indirect impacts to the SEPP 14 Wetland will be mitigated in accordance with the Integrated Water Management Strategy (refer to *Section 4.4.1*). *Section 4.5* also details wetland management measures, including the retention of a buffer proposed to protect the wetland areas and provide greater separation between development and the SEPP 14 Wetland.

7(b) Conservation Zone

The objective of the 7(b) Conservation zone is:

"…to enable a limited range of development (including tourist facilities) on land possessing special aesthetic or conservation values where:

(a) it can be demonstrated that the development can be carried out in a manner that minimises risks from natural hazards; and

(b) the development functions efficiently; and

(c) the development does not prejudice other economic development; and

(d) the development does not significantly detract from the scenic quality of the land within the zone; and

(e) the development is unlikely to have a significant detrimental effect on the growth of native plant communities; and

(f) the development is unlikely to affect the survival of native wildlife populations; and

(g) the development is unlikely to adversely affect the provision or quality of habitats for either indigenous or migratory species.

No development is permitted without consent in the 7(b) Conservation zone. Development for the purpose of advertisements; agriculture; bushfire hazard reduction; communication facilities; community facilities; dwelling-houses; motels; recreation areas; roads; tourist facilities and utility installations are permitted with consent. All other development is prohibited.

Comment

The 7(b) Conservation zone provides a designated buffer to the adjacent 7(a) Wetlands and Littoral Rainforest zone (SEPP 14 wetland) located between the buffer and the Myall River, as illustrated in *Figure 3.1* It also provides a buffer between the Myall River and the 2(f) - Mixed Residential-Commercial zone in the north east portion of the site.

Development proposed within the 7(b) Conservation zone is limited to the establishment of a foreshore park adjacent to the Myall River within the north east section of the site. The foreshore park is permissible with consent. No development is proposed within the portion of the 7(b) Conservation zone adjacent to the SEPP 14 wetland.

The foreshore park will provide the community with physical and social opportunities and will involve a landscaped open space area for passive recreation, controlled pedestrian access through the construction of walkways and the provision of community facilities such as BBQ areas and children's play equipment. The park will provide a linkage with other open space areas, thereby facilitating a connected system for future residents and facilitating fauna movement to the Myall River.

The proposal excludes development within the 7(b) Conservation zone adjacent to the SEPP 14 wetland. A pathway to be constructed adjacent to, but not within the 7(b) Conservation zone will provide for controlled public access to the foreshore area outside the conservation area, thereby minimising informal public access throughout the 7(b) buffer lands and SEPP 14 wetland. An asset protection zone to be constructed within the 2(f) zone, adjacent to the

7(b) buffer lands, will provide additional separation to the conservation area, minimising edge effects.

Development within the 7(b) Conservation zone, being limited to the creation of the foreshore park, will ensure the scenic quality of the zone is maintained. The conservation of the zone will allow for the continued growth of native plant communities and provide habitat for native species and populations and provides an important link to the Myall River.

As the project is permissible in the zones the Minister is able to give approval under clauses 75 (J) and 75 (O) of the EP&A Act.

3.5.2 Special Provisions

Development at Myall Quays (Riverside at Tea Gardens)

Clause 33A relates to development at Myall Quays, which is referred to in this report as "Riverside at Tea Gardens." The objective of Clause 33A is to:

"…..ensure that development on certain land at Myall Quays, being Lots 1, 8, Pt 9, 10 and 11 DP 270100 Myall Street, Admiralty Avenue, Budgeree Street and Toonang Drive, Lots 1–23, DP 285341 and Lots 1–15 DP 285432 Admiralty Avenue and Boston Street, Lots 413 and 487, DP 32559 Port Stephens Street and Tamworth Esplanade and Lot 80, DP 702022 Myall Street is controlled so that:

(a) commercial and retail facilities on the land are structured to serve the convenience needs of the residents and day and overnight visitors,

(b) any development on the land is sensitive to the natural environment, and

(c) any water body is maintained under the provisions of a community or neighbourhood scheme."

This clause applies to the land within the site notwithstanding that subdivision since the 1990s, when this clause was introduced into LEP 1996, has changed the property description of the site. In the 1990s it was thought that major commercial and retail facilities would eventually be developed in the North Hawks Nest future urban release area and therefore commercial and retail facilities should be restricted in the Tea Gardens area. However, severe ecological and servicing constraints have been identified in this future urban release area and it has since been decided that the North Hawks Nest future urban release area should be scaled back to a much more modest size.

As a result, the *Tea Gardens and Hawks Nest Conservation and Development Strategy* (Great Lakes Council and Acacia Environmental Planning Pty Ltd, 2003) adopted by Council no longer envisages major growth (including retail and commercial development) in the Hawks Nest area. The Strategy acknowledged that considerable growth would take place on the Riverside site and identified the Myall River Downs Site as a potential major growth

area of the future. Location of the major retail and commercial centre in this future growth precinct of the Hawks Nest and Tea Gardens area is a logical way to proceed.

The Project Application and Concept Plan simply propose to provide a street pattern and the necessary infrastructure (water, sewer, stormwater, telecommunications, electricity, etc) to facilitate future development of this Commercial Precinct. No buildings or any form of land use is proposed at this stage.

Subclause 33A(1)

Subclause 33A(1), which relates to constructing a shopping centre at Myall Quays, states that:

"…a person may, …carry out development for the purposes of a local shopping centre on land within Zone No 2 (f) that is generally bounded by Toonang Drive, Myall Street, Budgeree Street and the Myall River where the gross floor area (excluding pedestrian arcades, public mall areas and colonnades) of any building or buildings at the centre used for retail, office and business purposes does not exceed 3,000 square metres. However, the Council must not grant consent for the development of more than one local shopping centre on any such land."

Subclause 33A(1) specifies a local shopping centre may be constructed on the 2(f) zoned land at Myall Quays (bounded by Toonang Drive, Myall Street, Budgeree Street and the Myall River) and that the gross floor area of any building/s within the centre used for retail, office and businesses purposes must not exceed 3000 square metres. The intention of this clause was to ensure that major commercial activity did not take place on the Riverside site.

As explained above this restriction was introduced because in the 1990s when this clause was drafted, other areas were being considered for this type of development. However, given the significantly reduced size of the North Hawks Nest urban release area resulting from the adoption of the *Tea Gardens and Hawks Nest Conservation and Development Strategy* which identifies the Riverside and Myall River Downs sites as the major future growth precinct in the area, this restriction is no longer considered relevant. The fact that objections pursuant to State Environmental Planning Policy No 1 Development Standards have been supported by Council and approved by the Department of Planning to allow floor space to exceed this 3,000 square metre restriction is evidence that the standard is outdated and no longer aligns with the current growth strategy for the Hawks Nest and Tea Gardens area.

A far greater floor space is likely to be required in the future based on Council's adopted long term population projections. This is acknowledged in the revised draft *Tea Gardens Hawks Nest Housing Strategy* (PB, 2006). It envisages the Myall Quays shopping centre will remain and grow to be the main retail centre of the area and that an area adjacent to the shopping centre

should be identified for use by future commercial/mixed use development. The Housing Strategy is discussed at *Section 3.5.5.*

Likely demand for commercial and retail floor space is discussed in *Section 5.5*. The Concept Plan and Project Application designate the Riverside commercial precinct as having an approximate area of 40,000m^2 (excluding proposed roads). If a floor to site ratio (FSR) of 0.25 : 1 (typical of a single storey development) is adopted it would mean that a gross leasable area of 10,000m^2 could be developed in future. Alternatively if the same area were allowed to be developed at a higher FSR of 0.4 : 1 (typical of a 2-3 storey mix) then the gross leasable area would increase to around 16,000m^2.

While this is far in excess of the 3,000m^2 commercial / retail floor area limit established in Clause 33A(1), the proposal to create a subdivision pattern with the potential to accommodate the 10,000m^2 to 16,000m^2 of retail/ commercial floor space which is likely to be required in future is considered justified for the following reasons:

- **objective/ purpose of the standard** - the provisions of Clause 33A(1) were introduced to ensure appropriate and orderly expansion of commercial areas within Tea Gardens and Hawks Nest in order to meet the needs of the existing and future population as well as visitors. As explained above the planning intent behind this clause has changed with the passing of time and it is no longer considered relevant.

  As previously discussed the future growth of the Tea Gardens and Hawks Nest is documented in the revised draft *Tea Gardens Hawks Nest Housing Strategy* (PB, 2006). An overall principle of the strategy is to '*reinforce and consolidate existing commercial centres'*. The proposed Riverside commercial precinct provides the opportunity for the expansion of commercial / retail development adjacent to the existing Myall Quays commercial area, thereby consolidating the commercial centres to serve the existing and future population of Tea Gardens and Hawks Nest.

  The strategy identifies that '*the movement of the major retail centre to Myall Quays will better serve the future population patterns in the area'*. As detailed in *Table 5.1*, future population growth associated with the development of Riverside at Tea Gardens, Myall River Downs, Hermitage, North Hawks Nest, North Shearwater and other development (including infill) will result in a predicted population of 12,558, which is significantly greater than the 2006 census population of 3,155 (Duo, 2008).

  It is well accepted that with population growth comes increasing demand for retail and commercial services. Previous retail studies, including the *IBECON Tea Gardens Retail Study 2000* (IBECON 2000) and the *Wakefield Planning Tea Gardens Retail Study – Update of IBECON's 2000 Study (*Wakefield 2007) have documented the case for increased land to be made available for retail and commercial development on the Riverside site. The Wakefield report identified a high demand for the proposed commercial/retail development on the Riverside site, and noted that it

would be able to provide for the Tea Gardens and Hawk Nest area well beyond the year 2016.

Tea Gardens/Hawks Nest is a relatively isolated area, with Raymond Terrace providing the closest level of hierarchy in terms of shopping. Raymond Terrace is 52 km by road from Tea Gardens. It is therefore appropriate to provide retail capacity in Tea Gardens/Hawks Nest to meet the locally generated demand for commercial and retail services.

The proposed Riverside commercial precinct will have the capacity to accommodate far in excess of 3000m² of retail and commercial floor space and will facilitate the consolidation of commercial / retail development to serve the current and future population of Tea Gardens and Hawks Nest. This is consistent with the objectives of Clause 33A.

- **consistency with Section 5(a) (i) and (ii) of the EP&A Act 1979 –** The objects of the EP&A Act are detailed in Section 5(a) of the Act. The objects stated in Sections 5(a) (i) and (ii) are:

  (a) to encourage:

  (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,

  (ii) the promotion and co-ordination of the orderly and economic use and development of land,

  The proposed Riverside commercial / retail development is consistent with the objects of Section 5(a) (i) and (ii) of the EP&A Act, as:

  - the site is not prime agricultural land and will not impact in prime agricultural land;

  - the site of the commercial / retail area is not located within or adjacent to an area of significant ecological value. The SEPP 14 wetland and adjacent wetland buffer located within the Riverside at Tea Gardens site will not be affected by the proposed commercial / retail precinct;

  - the Riverside at Tea Gardens development incorporates an integrated water management plan, including the extension of the existing detention lake at Tea Gardens and the inclusion of several new freshwater detention basins and ponds to provide water quality management for the development, including the commercial / retail precinct. The development will also be connected to MidCoast Water's sewage system. The commercial / retail development will therefore not be likely to adversely impact on the area's water resources;

- the commercial precinct will provide an essential connection between existing commercial and retail development and the existing and proposed residential development at Riverside and the future residential developments within Tea Gardens and Hawks Nest, including Myall River Downs, Hermitage, North Hawks Nest, North Shearwater and other development (including infill); and

- as identified above, the consolidation of commercial / retail development at Myall Quays is identified in the revised draft *Tea Gardens Hawks Nest Housing Strategy* (PB, 2006). The proposed commercial / retail development will facilitate the orderly economic development of the site consistent with the draft strategy.

- **Reasonableness –** In order to facilitate the orderly economic development of the site and ensure the commercial and retail needs of the future population of Tea Gardens and Hawks Nest are met the proposed Riverside commercial precinct offers the opportunity to develop a consolidated and structured commercial area. The proposed commercial precinct will be likely to have minimal environmental impacts given the safeguards proposed to protect the local water resources as set out in the integrated water management strategy. It is therefore considered a reasonable proposal which serves the public interest.

The extension of the existing commercial / retail precinct forms part of the project application and will be undertaken during Stage 1 of the project, as detailed in *Section 2.11*.

Summation

The additional commercial / retail floor space proposed as part of the Riverside at Tea Gardens Project Application, whilst exceeding the 3,000 square metre requirement of Clause 33A(1), will facilitate the provision of adequate commercial and retail services to meet the future needs of the population of Riverside at Tea Gardens and existing residences (such as Myall Quays) and is consistent with the intent of the draft *Tea Gardens Hawks Nest Housing Strategy* (PB, 2006).

Subclause 33A(2)

Subclause 33A(2) states:

(a) This subclause applies to development on land within Zone No 2 (f) for the purpose of a lake or other waterbody.

(b) (Repealed)

(c) In determining an application for development to which this clause applies, the Council must take into consideration:

(i) the extent to which the proposed development is likely to affect the environmental qualities on the adjoining wetlands within Zone No 7 (a) or wet heath areas within Zone 7 (b), and

(ii) the likely cumulative impact (in conjunction with existing waterbodies) on the Myall River.

Subclause 33A(2) relates to the impact on adjoining conservation areas and the Myall River of the development of a lake or other water body at Myall Quays. It states that Council must have the concurrence of the Department of Urban Affairs and Planning (now the Department of Planning) before granting consent to such a development, and that the Department must take into consideration the environmental impacts of such a development on the surrounding wetlands, wet heath areas and the Myall River.

On 24 February 2004, the Minister for Planning made a declaration under Section 76A(7)(b) of the EP&A Act that made any water body proposed on parts of the Riverside site 'State Significant Development'. It is noted that Section 76A(7) has been repealed and a reference in any Act or instrument to State Significant Development within the meaning of the Act is taken to be a reference to a project to which Part 3A of this Act applies. The Project Application is seeking approval for the partial extension of the existing detention and water quality management lake in addition to a number of separate fresh water bodies to cater for drainage from the proposed development. An assessment of the impact of the detention / water quality management lake on the adjacent 7(a) and 7(b) zones and Myall River is provided in *Volume 3*.

The intent of clause 33A(2) is being realised as this application under Part 3A of the EP&A Act will be determined by the Minister for Planning who will take advice from the Department of Planning prior to determining this application.

3.5.3 Development Control Plans

Development Control Plan 22 – Myall Quays Estate

Development Control Plan 22 – Myall Quays Estate (DCP 22) applies to land referred to in this report as 'Riverside at Tea Gardens'. DCP 22 provides management principles and actions that proposed development should follow. The management principles and actions relate to:

- conservation of wetland and native species associations;
- earthworks, hydraulic assessment and waterbodies;
- water quality;
- infrastructure;
- open space and conservation areas;

- community and recreation facilities;
- archaeology;
- bushfire protection;
- building guidelines;
- tourist uses; and
- development below the mean high water mark (MHWM).

DCP 22 is outdated as it was prepared prior to recent environmental studies and investigations into the capabilities and suitability of the site. While many of the management principles and actions outlined in the DCP remain relevant, some of the specific controls are no longer appropriate as they are based on a previous master plan that has little resemblance to the current (and proposed) development of the site, nor in any event, can this master plan be realised, given the current planning legislation. It is also noted that the *revised draft Tea Gardens / Hawks Nest Housing Strategy* (Parsons Brinkerhoff, 2006) recommends several amendments to this DCP to ensure that it is in accordance with the new release area principles of the Strategy. It is anticipated that the DCP will be repealed and replaced by a concept plan for the Riverside at Tea Gardens Estate.

Compliance with DCP 22 is detailed within *Table 3* of *Annex H* of *Volume 1*.

Development Control Plan 30 Residential Urban Areas

Development Control Plan 30 – Residential-Urban Areas (DCP 30) provides design guidelines for high quality urban housing. DCP 30 provides performance criteria that should be considered in the design of residential developments. Design elements covered in DCP 30 include:

- site planning;
- site analysis;
- site layout;
- building design;
- building appearance;
- landscape design;
- security; and
- services and site facilities.

The subdivision layout for Stage 1 will allow for dwellings to be erected that comply with the provisions of DCP 30. The *revised draft Housing Strategy* has recommended that DCP 30 be amended to incorporate more detailed urban

design and streetscape guidelines based on the character of the area. It also recommends that to ensure a range of house sizes is provided in new release areas, an FSR of 0.4:1 be applied to small lot housing together with a requirement that 40% of the site be used for soft landscaping. Small lot housing is to be dispersed throughout new release areas.

Development Control Plan 31 - Subdivision

Development Control Plan 31 – Subdivision (DCP 31) outlines the subdivision requirements in residential, commercial/industrial and rural and environmental zones. Section 2 outlines the general requirements for subdivision in all zones regarding site considerations, site hazards, road design and construction, landscaping and site design, services, drainage, existing development and heritage and environmental protection.

Section 3 of DCP 31 relates to residential subdivision. Performance criteria are provided in DCP 31 which are intended as a guide to developers. Generally lots less than 450m^2 will not be permitted in a residential zone, and lots over 450m^2 should be capable of containing a building envelope measuring 8m x 20m or 10m x 16m and have private open space areas of 40m^2 with a minimum dimension of 4m. However, the *revised draft Tea Gardens / Hawks Nest Housing Strategy* recommends that this DCP be amended to make provision for small lot housing (i.e. between 300m^2 and 450m^2).

The project generally complies with the provisions of DCP 31 as detailed within Table 4 of *Annex H*, *Volume 1*.

Stormwater Quality Development Control Plan

The Great Lakes *Stormwater Quality Development Control Plan* (Stormwater DCP) encourages good design and technology to improve the water quality of the Great Lakes area. It specifies that development will need to reduce the volume of stormwater runoff and pollutants in stormwater that is directly connected to Council's stormwater drainage network. The Stormwater DCP applies to land zoned 1(c) and all 2, 3, 4, 5 and 6 zones under the Great Lakes LEP 1996. Therefore, the Stormwater DCP currently applies to the land zoned 2(f) at the 'Riverside at Tea Gardens' site.

Subdivision

Under the Stormwater DCP, subdivisions must either meet stormwater management requirements outlined in the relevant catchment strategy or DCP, or where there are no specific Council strategies or DCPs, meet the requirements in Section 2.4 of the *Stormwater Quality Development Control Plan.* Section 2.4 states that applicants for subdivision will need to model post-development pollutant loads for the proposed land use and that the applicant must use acceptable modelling software to produce these results. This information must be submitted with a development application.

Development

Under Section 3.3 of the Stormwater DCP, residential development (a detached house on one lot or dual occupancy development) complies with the DCP if it prevents runoff from all driveways being direct-connected to a stormwater drainage network draining to the street (i.e. by ensuring that stormwater drains across the site or to on-site landscaped or infiltration areas provided suitable soils are present).

Section 3.4 of the Stormwater DCP relates to tourist, commercial, retail and industrial developments. A development complies with the DCP if it captures and stores the first flush of 2mm from all impermeable site areas. The required storage volume (V) is:

V (litres) = total impermeable site area (m^2) x 2

Overflows from the storage tank/s must be directed to an on-site landscaped area/s for infiltration.

Stormwater management for the site has been the subject of exhaustive studies and a best practice stormwater strategy has been prepared. Details are provided in *Volume 3*.

3.5.4 Car Parking Policy

Great Lakes Council *Car Parking Policy* outlines the amount of car parking required for various types of development. *Table 3.2* outlines the requirements for development permissible in the Residential 2(f) Mixed Residential-Commercial zone.

Table 3.3 Car Parking Requirements

Land Use	Type of Development	Car Spaces Required
Residential*	Dwelling Houses	1 covered space
	Dual Occupancy (Granny Flat)	2 spaces
	Residential Flat Buildings	1space/1 bedroom unit, plus 1.2 spaces/2 bedroom unit, plus 1.5 spaces/3 or more bedroom unit, plus 0.2 visitor spaces/unit, plus 1 trailer space/8 units (0.125/unit)
Casual Accommodation	Bed & Breakfast	1 space/bedroom plus proprietor space
	Motels	1 space/unit, plus 1 space/2 employees, plus 1 space/20m^2 floor area, plus 1 space/20 seats of a function room, plus 1 space/8m^2 of bar space
	Hotels	1 space/5m2 bar area, plus 1 space/6m2 lounge area, plus 1 space/room, plus

Land Use	Type of Development	Car Spaces Required
		1 space/3 employees, plus 1 space/20 seats of a public dining room, plus 1 space/20 seats of a function room
Commercial	Offices	1 space/20m2 of gross leasable floor area (ground floor) 1 space/30m2 of gross leasable floor area (1st floor and above)
	Professional Offices/Consulting Rooms	4 spaces/surgery
	Service Stations	5 spaces/service bay, plus 1 space/20m2 of retail sales area
	Shops	1 space every 20m2 of gross leasable floor area (ground floor) 1 space every 30m2 of gross leasable floor area (first floor level and above)
Recreational	Squash & Tennis Courts	3 spaces/court
	Bowling Alleys	3 spaces/bowling alley
	Bowling Greens	20 spaces/bowling green
	Gymnasiums	1 space/25m^2 of gross floor area
	Caravan Parks	1 space/van site, plus 1 visitor space/20 van sites
	Restaurants within Commercial Area or Complex	1 space/20m^2 dining area of restaurant at ground floor level 1 space/30m^2 of dining area for restaurant above the ground floor
	Restaurants not part of a Commercial Area or Complex	1 space/10m^2 of dining area
Recreational	Licensed Clubs	1 space/5m2 bar area, plus 1 space/6m2 of lounge area, plus 1 space/3 employees, plus 1 space/20m2 of gross floor area of a public restaurant, plus 1 space/20 seats in an auditorium
	Theatres/Churches and other places of Assembly	1 space/10 seats, or 1 space/10m2 of seating area, whichever is greater

* Homes for the aged, hostels & nursing/convalescent homes have different car parking requirements.

The above car parking requirements are considered excessive for the site as a 'walkable community' has been identified as an appropriate aim for any proposed development. Nevertheless, lots are of sufficient size to accommodate a dwelling and on site car parking space.

3.5.5 Local Planning Strategies and Studies

Tea Gardens Hawks Nest Conservation and Development Strategy

The *Tea Gardens / Hawks Nest Conservation and Development Strategy* (Great Lakes Council and Acacia Environmental Planning Pty Ltd, 2003) was produced in response to the increasing demand for development in the area. The strategy identifies areas that are suitable for development and areas that should be conserved for ecological purposes. The objectives of the strategy are to:

1. *Create a conservation framework that identifies and conserves important habitats and linkages.*

2. *Identify land that is suitable for future living.*

3. *Give the providers of public facilities and services information to help them plan new infrastructure.*

4. *Promote orderly and efficient growth that is consistent with the principles of ecologically sustainable development (ESD) and the objects of the Environmental Planning and Assessment Act 1979*

5. *Indicate preferred land uses in development and investigation precincts.*

6. *Identify guiding principles for future development.*

7. *Provide greater certainty in the rezoning process to all stakeholders.*

The strategy has been publicly exhibited and has been adopted by Council. The Department of Planning (DoP) required that the *Tea Gardens/Hawks Nest Housing Strategy* (see following section) be prepared prior to endorsement of the Conservation and Development Strategy. The *Draft Tea Gardens/Hawks Nest Housing Strategy* has been publicly exhibited and has also been adopted by Council. The DoP has endorsed the priority one release areas identified with in the *Tea Gardens/Hawks Nest Conservation and Development Strategy* (which includes Myall River Downs).

The Riverside at Tea Gardens site is not identified in the strategy as a potential future residential area, due to the fact that the site is already zoned 2(f) and can be developed for urban purposes. The strategy does identify the Myall Quays (Riverside at Tea Gardens) site on its precinct map and provides brief comments including that the site was rezoned in 2000, and is suitable for low and medium density residential development, tourism, shopping, community and recreational facilities.

Draft Tea Gardens/Hawks Nest Housing Strategy

The draft *Tea Gardens Hawks Nest Conservation and Development Strategy* (PB, 2006) (as discussed in the previous section) was prepared to ensure that future housing demands could be met. As issues specifically associated with dwelling types, dwelling densities and lot yields were not addressed in the *Tea Gardens Hawks Nest Conservation and Development Strategy*, the was prepared and released in 2005.

Submissions received as a result of the public exhibition of the draft *Tea Gardens / Hawks Nest Housing Strategy* have been reviewed by Council and as a result a second draft of the Housing Strategy was prepared and publicly exhibited from 1 June to 30 June 2006. Council adopted the second draft on the 28 November 2006. The density recommendations of the second draft Housing Strategy support an average of 13 dwellings per hectare net for greenfield sites. The proposed concept plan for the development of the site is based on dwelling densities in the order of 13 dwellings per hectare net. The stage 1 project application also achieves an average density of 13 dwellings per hectare.

The draft Housing Strategy makes several other recommendations with respect to LEP amendments, DCP amendments and affordable housing. Generally the draft Strategy supports mixed density neighbourhoods (rather than segregated areas of lower and higher density) and recommends that Great Lakes LEP be amended to permit small lot housing in all residential zones. It also encourages the development of affordable housing options in appropriate locations, such as shoptop housing, long term caravan sites, boarding houses and the like.

The project application is proposing a mixed density residential subdivision and is consistent with the principles of the Housing Strategy.

Recovery Plan for the Hawks Nest and Tea Gardens Endangered Koala (Phascolarctos Cinereus) Population

The Hawks Nest and Tea Gardens koala population was listed as endangered in 1999 under the *Threatened Species Conservation Act 1995,* and as a result the Director-General of the National Parks and Wildlife Service (now Department of Environment and Climate Change or 'DECC') was required to prepare a Recovery Plan for the population.

The Recovery Plan outlines measures that Council, as the land use planning and development control authority, should follow when assessing development applications. The Recovery Plan encourages the conservation of koala habitat and for identified areas of koala habitat to be incorporated into local planning instruments. The implications of the Recovery Plan for the development of the site are discussed in the ecological assessment in *Volume 3*.

4 ENVIRONMENTAL ASSESSMENT

This Chapter provides an assessment of key environmental issues arising from the proposed development and sets out mitigation and management to measures aimed at avoiding, minimising mitigation and manage any deleterious impacts.

4.1 INTRODUCTION

Key environmental issues identified in the Director General's requirements are coastal protection, water cycle and aquaculture management, wetland management, canal estate development, land / water interface, dredging and reclamation, fishing and aquaculture, soils and contamination, Aboriginal cultural heritage, bush fire, flora and fauna and ameliorative measures, infrastructure capacity, traffic and access, environmental risk assessment, cumulative impacts and urban design issues including density, amenity, site permeability, scale and staging. These key issues are addressed in the following pages.

4.2 COASTAL PROTECTION

The issues associated with coastal protection have been discussed in *Section 3.3.6*. The site is within the coastal zone and those parts of the site that are within 100 metres of the Myall River, the Port Stephens-Great Lakes Marine Park and within the SEPP 14 Wetlands are defined as 'sensitive coastal locations'.

Part 2, clause 7(a) of SEPP 71 specifies the matters that should be taken into consideration when a consent authority determines a development application to carry out development on land within the coastal zone and where certain development applications propose to carry out development in 'sensitive coastal locations'. The matters for consideration are listed in *Clause 8* of SEPP 71, and are reproduced in *Table 3.2.*

4.3 WATER CYCLE MANAGEMENT

4.3.1 Groundwater

Groundwater Conditions

Previous groundwater investigations (in 2004) identified shallow water tables present over the site ranging from 0.5 metres to 1.7 metres below ground level. The groundwater level tended to be shallower in proximity to Myall River and

deeper further from the river. Currently groundwater is used only for minor home irrigation (Coffey, 2007a).

Shallow rock levels to the north of the site provide a barrier to groundwater inflow from that direction. A sandy aquifer is expected to extend to the south and west of the site and be in hydraulic contact with the waters of the Myall River to the south, Wobbegong Bay and Pindimar Bay (Port Stephens) to the south west and Kore Kore Creek to the west. The aquifer is in contact with saline water in the Myall River and also with the brackish water in the lake to the south (Coffey, 2007a).

During periods of low rainfall, losses from the groundwater system are likely to occur due to seepage to the Myall River and evapotranspiration from areas of shallow water table (Coffey, 2007a).

Groundwater Levels and Flow Direction

Recent modelling results indicated that the extension of the lake would cause localised drawdown on the north western most extremity of the extended lake by up to one metre. This groundwater level on the north – western tip of the lake extension would fall slightly below levels interpreted to have acid soil producing potential. The affected area however, is considered to be limited and the exceedance of criteria of ASSMAC for the predicted resulting groundwater levels. Therefore, the proposed extension of the lake would not be likely to adversely affect site groundwater outside the proposed lake extension (Coffey, 2007a).

Groundwater modelling also showed that groundwater contours have altered in proximity to the lake extension. This would induce groundwater flows towards the lake which will act to prevent the intrusion of saline water into the aquifer from the Myall River and the brackish water from the lake.

The results from groundwater modelling demonstrated that there would be negligible impacts to the SEPP 14 wetlands, with only a marginal decrease in groundwater levels (less than 0.1 m drawdown) on the western edge of the wetland (Coffey, 2007a).

Groundwater Quality

Testing completed as part of current investigations has indicated that groundwater quality has not changed significantly since 2004. The results are generally below the key criteria for protection of species in marine water presented in the ANZECC guidelines, with the exception of some metal concentrations. The groundwater from the bores closer to the Myall River tends to be characterised by higher EC and a similar anion and cation ratio as seawater. This suggests that seawater is being diluted as a result of rainfall recharge from the catchment (Coffey, 2007a).

Groundwater modelling indicated that the saltwater interface would not be significantly affected by the development.

When compared to the Australian Drinking Water Guidelines, the groundwater is not potable due to concentrations of a range of analytes exceeding the drinking water guidelines. Groundwater in all bores on site and the surface water in the lake are acidic to slightly acidic and outside the lower criterion for drinking water of pH 6.5. Elevated ammonia concentration found in some bores also renders groundwater unsuitable for drinking as it exceeds ANZECC guidelines (Coffey, 2007a).

Reuse of Reclaimed Water

Crighton Properties have been liaising with Midcoast Water for an extended period to provide reclaimed water supply to the site. Whilst both Crighton Properties and Midcoast Water are supportive of the use of reclaimed water throughout the Riverside site, Midcoast Water is not in a position to embark upon required upgrades to treatment facilities (to allow for the delivery of this supply) until such time as a level of security of future use of the resource is provided (through the approval of residential development) and a more detailed analysis is completed.

Therefore water supply and drainage modelling undertaken for the Riverside at Tea Gardens Environmental Assessment has been carried out to accord with the use of rainwater tanks to achieve BASIX compliance. However, information as to the likely future use of reclaimed water via a third pipe reticulation system is provided as detailed below and within *Section 4.21.3*.

Recent groundwater results suggest that the reclaimed water from the nearby sewerage treatment facility may be suitable for irrigation of open spaces and gardens within the development area subject to a small reduction in total nitrogen concentrations. This reduction could be achieved through a combination of treatment and dilution of the reclaimed water with water of a higher quality (Coffey, 2007a).

Calculations of the time it takes for groundwater to flow from the development site to lake or river indicated that it moves at a rate of approximately 10 m/year. Leaching tests indicated that nitrate will move at a similar rate to the groundwater and that phosphorous would move at a significantly slower rate. Therefore, the irrigation impacts are unlikely to adversely impact groundwater or the water in the lake, if one of the treatment options set out in the *Groundwater Assessment* report by Coffey Geotechnics Pty Ltd, (2007a) is pursued.

Appropriate monitoring of all irrigated areas will ensure key indicators remain within the relevant guidelines. Monitoring would include:

- the irrigation water and groundwater quality;

- the application rates and timing of irrigation water; and
- soil testing.

Further detail is provided in *Section 4.21.3* and in the *Groundwater Assessment* report prepared by Coffey Geotechnics Pty Ltd (2007a). This report is annexed within *Volume 3.*

4.3.2 Water Quality Management

Catchment Conditions

The catchment is located on the eastern side of Myall Street and extends from Myall River northwards to high ground near Viney Creek Road. The total area of the catchment is approximately 272 ha.

Surface water drains partly toward the existing lake and partly toward the SEPP 14 wetlands on the eastern boundary of the site. The site is subject to both local and river flooding. Local flooding has been observed by the land owners and Council staff. This local flooding reflects the flat ground slopes and absence of natural drainage channels.

The impact of the existing development on flood flows was mitigated by constructing a detention lake to temporarily store floodwaters and to release it at a rate similar to predevelopment conditions. A number of small retarding basins have also been built within the existing development to meet retardation requirements (Cardno Willing, 2004).

Management of Water Quality

A water quality management program was established in 1996. The primary aim for the existing management of water quality is to protect the SEPP 14 wetland by directing the runoff from the catchment to a tidally flushed lake. This is also supported by a number of smaller ponds and wetlands located within the residential areas.

Water quality impacts on the lake at Myall Quays are due to event-driven loads from runoff, decay of in-lake algae and releases from sediments. Tidal inflows can also impact on water quality. The stormwater runoff impacts can be expected to increase with urban development in the northern part of the project site unless remedial measures are provided and/or the lake is increased in size.

The Water Quality Objectives include:

- the lake and ponds meet microbiological standards for bacterial content and pathogens;

- the lake and ponds be free of nuisance organisms such as algal scums and odours, midges and aquatic worms;
- visual clarity and colour, physical appearance of lake / pond and discharged water to be clear and colourless;
- pH within range 5.0-9.0;
- toxic chemicals meet standard for untreated drinking water;
- surface films such as oil and petrochemicals should not be visually noticeable nor detected by odour;
- sustain a healthy ecosystem;
- free of trash and debris;
- free of mosquito related health risks and irritants; and
- free of nuisance macro aquatic plants.

Existing Water Quality

The sampling indicates that the lake water is brackish, consisting of a mean salinity of 12 g/L, which is approximately one third of the salinity of seawater. There is variability in the salinity concentration due to both catchment (freshwater) runoff as well as the influence of tides and varying salinity in the Myall.

The mean Dissolved Oxygen level within the lake for the sampling period is 6.6 mg/L, with a 10th percentile level of 4.9 mg/L. The 4.9 mg/L level is just below the recommended ANZECC trigger value of 5.0 mg/L for freshwater fish.

The dissolved oxygen levels measured within the Myall Quays Lake and the Myall River have been compared and the data shows the ANZECC high quality guidelines for DO are not currently met at all times, in either the lake or river (Copeland Ave Wharf). This data shows the DO levels in the existing lake are often better that in the Myall River.

The adopted ANZECC 2000 trigger value for Phosphorus (P) is 0.03 mg/L for estuarine systems. Most of the samples have been below the recommended value, with a mean of 0.02 mg/L. Higher P levels occurred soon after the lake was constructed, possibly due residual P released from exposed soil.

The ANZECC 2000 trigger value for Nitrogen (N) is 0.3 mg/L for estuarine systems. The samples measured have generally been low, contributing to the overall good water quality in the existing lake.

Most chemical indicators are below the ANZECC 2000 trigger values. There is 90% of the catchment that is undeveloped, with the existing treatment measures in the southern part of the catchment seemingly assisting with maintenance of good water quality with the existing lake.

4.4 WATER MANAGEMENT SCHEMES

4.4.1 Integrated Water Management Plan

An integrated water management plan has been prepared by Cardno Willing (NSW) Pty Ltd (Cardno, 2008a). The management plan considers flooding and drainage, water quality and maintenance activities, monitoring and management. An assessment of the impact of climate change has also been undertaken (Cardno, 2008b) (attached as Appendix I to the Integrated Water Management Plan within *Volume 3*)

The design incorporates drainage and water quality measures within the open space network as described below.

Flooding and Drainage

Four main drainage lines have been identified within the development footprint. Runoff from up to the 100 year ARI event from the upper catchment areas is to be directed east along one of the drainage lines, which is incorporated into the proposed open space and wildlife movement corridor along the north boundary. Runoff will then be directed south east to a swale located on the eastern boundary of the site. In turn this swale will distribute runoff along the western boundary of the 7(b) Conservation (wetland buffer) zone to reduce the concentration of runoff into the 7(b) Conservation (wetland buffer) zone and the SEPP 14 wetland. The proposed development south of the open space and wildlife movement corridor will drain southwards towards the proposed extended detention lake. A major retarding basin is proposed within this open space corridor as well as a local basin to reduce 100 yr ARI peak flows from the development to the Myall River and the wetland.

The extension of the existing lake to a water body with a 9.5 hectares water surface will also create additional storage to further mitigate increases in peak runoff up to the 100 yr ARI event from the development.

Probable Maximum Flood

Riverside at Tea Gardens is subject to flooding from both the Myall River and from runoff from the local catchment. An assessment of the Probably Maximum Flood (PMF) levels, involving modelling under river and local flooding (without climate change) has been undertaken (refer to *Volume 3* of the EA (Cardno, 2008c)).

The estimated PMF levels in the Myall River in the vicinity of Riverside are summarised in *Table 4.1* as follows:

Table 4.1 Probable Maximum Flood Levels

Event	Description	Estimated Flood Level (mAHD)
PMF	The PMF level under existing conditions with a 100 yr ARI downstream boundary level in the lower reach of the Myall River of RL 1.89 m.	2.82 – 2.89 m
PMF	The PMF level under existing conditions with an extreme downstream boundary level in the lower reach of the Myall River of RL 2.0 m	2.86 – 2.93 m

The Riverside proposal has an additional freeboard of 0.3m over and above Council's adopted minimum floor level of 2.6m AHD in areas subject to inundation from the Myall River to avoid over floor flooding in a 100 yr ARI event under all climate change scenarios. The adopted minimum floor level of 2.9 m is comparable to the estimated PMF level in the Myall River.

The estimated local PMF levels are summarised in Table 2 of the Cardno Probable Maximum Flood report (refer to *Volume 3* of the EA).

It was noted that in almost all locations the 1 hour PMP storm gave the highest flood level except for the upper reach of the West Branch where the 30 minute PMP storm gave the highest estimated flood levels. In most locations it was estimated that the PMF level is between 0.9 m to 1.45 m higher than the local 100 yr ARI level.

It should be noted that the local PMF levels are based on floodwaters confined to the drainage corridors and as such these are conservative estimates. During a PMF event local runoff would spill from the drainage corridors into the residential areas which would result in lower PMF levels than summarised in Table 2 (Cardno, 2008c).

Consideration of Climate Change

The Department of Environment and Climate Change (DECC) have advised that the Floodplain Risk Management Guideline titled *Practical Consideration of Climate Change* (DECC, 2007) should be considered for all developments where there are potential impacts as a result of climate change. This relates to impacts associated with sea level rise and increase in rainfall intensity.

The Intergovernmental Panel on Climate Change (IPCC) has recommended that for the east coast of New South Wales the sea level rise is expected to be 0.18 to 0.91 metres by between 2090 and 2100. Additionally, climate change impacts on flood producing rainfall events to 2070 show a trend for larger

scale storms which will potentially impact on current design ARI due to increases in rainfall.

The planned development is subject to flooding from both the Myall River and from runoff from the local catchment. Sensitivity assessments of climate change have been undertaken by Cardno Willing (2008b) for the scenarios identified in the Floodplain Risk Management Guideline (DECC, 2007). These scenarios include +0.18m, +0.55m and +0.91m rises in sea level as well as 10%, 20% and 30% increase in rainfall intensities. The results of the analysis are provided as *Appendix I* within the Integrated Water Management Plan within *Volume 3* of the EA.

The following conclusions were drawn from the sensitivity runs for the Myall River:

- the current adopted 100 yr ARI level of 2.1m AHD could accommodate up to a 30% increase in rainfall under conditions where there is no increase in sea level;
- a 30% increase in rainfall increases 100 yr ARI levels in the Myall River by:
  - 0.06 m to 0.07m under a sea level rise of 0.18 m;
  - 0.04 m to 0.06m under a sea level rise of 0.55 m; and
  - 0.03 m to 0.04m under a sea level rise of 0.91 m.
- depending on the adopted increase in rainfall intensity, the freeboard in Council's adopted minimum Flood Planning Level of 2.6 m AHD is:
  - around 0.43 to 0.25m under the +0.18m sea level rise scenario;
  - around 0.02 to 0.07m under the +0.55m sea level rise scenario; and
  - exceeded by 0.26m to 0.3m under the +0.91 m sea level rise scenario (Cardno Willing 2008b).

The results of the river flooding inundation plots identified that:

- river flooding under either a low or a medium climate change scenario would not inundate any unimproved lots;
- river flooding under a high climate change scenario would partially inundate around 180 - 220 unimproved lots (but not over floors) to a maximum depth of 0.3m;
- under a low climate change scenario there would be minimal inundation of planned roads;
- under a medium climate change scenario there would be inundation of a number of planned roads by up to 0.5m (which would be Low Hazard due

to the expected very low velocity on the fringes of the river flooding through the development); and

- under a high climate change scenario there would be increased inundation of a number of planned roads by up to 0.8m (which would be still Low Hazard due to the expected very low velocity of flow on the fringes of the river flooding through the development) but would comply with the requirements for safe wading.

The results of the sensitivity runs for the local catchment concluded that:

- the 1.5 hour storm burst gives higher local 100 yr ARI flood levels than the 9 hour storm burst in areas where the estimated 100 yr ARI flood level is greater than 2.1m AHD;

- the East Branch and North Branch Flood Planning Levels are controlled by the Myall River under a +0.18m or greater sea level rise;

- the Flood Planning Levels adjacent to the West Branch are controlled progressively by the Myall River as the sea level rise increases;

- the Flood Planning Levels adjacent to the lower reaches of the East West Branch are controlled progressively by the Myall River as the sea level rise increases; and

- the greatest increase in the 100 yr ARI flood level in the East West Branch in the reach unaffected by sea level rise is 0.28m (Cardno, 2008b).

The planned development has adopted an additional freeboard of 0.3m for minimum floor levels over and above Council's adopted minimum floor level of 2.6m AHD in areas subject to inundation from the Myall River to mitigate the impacts of climate change and to avoid over floor flooding in a 100 yr ARI event under all climate change scenarios. The adoption of a minimum floor level of 2.9m AHD will provide all homes in the development with a far greater level of protection against climate change than a large number of existing properties in Tea Gardens.

Elsewhere in the planned development the adoption of a minimum floor level of 0.5m above the local 100yr ARI flood level (under no climate change) would provide a minimum 0.22m freeboard above the local 100 yr ARI flood level under a high climate change scenario.

While under a high climate change scenario, there would be increased inundation of a number of planned roads by up to 0.8m (which would still be Low Hazard due to the expected very low velocity of flow on the fringes of the river flooding through the development) however this would comply with the requirements for safe wading. Even under a high climate change scenario, planned roads would provide flood free egress via a number of roads for residents evacuating from threatened properties to higher ground on the

northern and north western boundaries of the development (Cardno, 2008b) (refer to *Volume 3*).

Water Quality

The primary aim for the management of water quality is to protect the SEPP 14 wetland by directing runoff from the catchment to a tidally flushed lake. The treatment train includes a number of smaller ponds and artificial wetlands located within the residential areas. Water quality impacts on the lake at Myall Quays are the result of event-driven loads from runoff, decay of in-lake algae and releases from sediments. Tidal inflows can also impact on water quality. The stormwater runoff impacts can be expected to increase with urban development in the northern portion of the site unless remedial measures are provided and / or the lake is increased in size.

The Water Quality Objectives include:

- the lake and ponds meet microbiological standards for bacterial content and pathogens;
- the lake and ponds be free of nuisance organisms such as algal scums and odours, midges and aquatic worms;
- visual clarity and colour, physical appearance of lake / pond and discharged;
- water to be clear and colourless;
- pH within range 5.0-9.0;
- toxic chemicals meet standard for untreated drinking water;
- surface films such as oil and petrochemicals should not be visually noticeable nor detected by odour;
- sustain a healthy ecosystem;
- free of trash and debris;
- free of mosquito related health risks and irritants; and
- free of nuisance macro aquatic plants.

To achieve these objectives a combination of measures will be implemented, including:

- the installation of rainwater tanks on all new residential lots;
- extending the existing detention lake;

- constructing a number of ancillary water quality control ponds to create a 'treatment train' for runoff prior to discharge into the lake;

- constructing local wetlands to create a 'treatment train' for runoff prior to discharge to the Myall River and the existing wetland; and

- constructing a 770 metre long swale along the eastern edge of the development to distribute flow to the buffer area and existing wetland.

The maintenance of the pond and wetland will be based on practices already implemented for the existing ponds and wetlands located within developed areas of Riverside. Anticipated maintenance activities include:

- routine inspections of inlet and outlet points and removal of accumulated litter and debris;

- periodic draining and desilting of the ponds (every five to 10 years);

- inspection and removal of noxious and invasive weeds from within the macrophyte zone (every one to three months during establishment phase);

- replacement of plants that have died (as needed); and

- 'resetting' the macrophyte zone every 20 to 50 years, depending on the pollutant loading rate on the system.

The maintenance of the extended lake will be based on practices already implemented for the existing detention lake and generally include:

- inspection and removal of accumulated debris and litter from inlet and outlet structure;

- inspection and removal of noxious weeds from within the water body;

- inspection and removal of any vegetation that my invade the outlet channel to maintain the outlet capacity; and

- inspection and removal of accumulated sediment from inlet zones as needed.

Management of aquatic weeds in the constructed pond and wetland systems and extended detention lake will be implemented to ensure that weeds do not compete with species planted for specific design requirements. Management will be based on practices already implemented for the existing detention lake, ponds and wetlands.

During the early stages of wetland establishment waterbirds can cause a nuisance by pulling out plants. To mitigate this impact an interlocking planting system may be used as water birds find it difficult to lift interlocking plants.

Gross pollutant traps (GPTs) are not proposed to be constructed.

Monitoring

Monitoring programs are proposed to occur for the SEPP 14 Wetlands, the extended detention lake, the constructed freshwater lakes, ponds and wetlands. These programs are to be designed and implemented by various stakeholders including the landowner, contactor/builder, Myall Quays Community Association (residents), Great Lakes Council and DECC. Stakeholders are proposed to meet and review the outcomes of the monitoring after three (3) years and agree to the scope of ongoing monitoring programs, the timing and any subsequent review. The details of the technical methods for the monitoring programs are outlined within the Integrated Water Management Report prepared by Cardno Willing (2008a) annexed within *Volume 3.*

Management actions have been proposed to rectify any potential failures as a mitigation measure to meet the water quality objectives. These proposed actions would trigger immediate sampling of the waterbodies. The frequency of sampling will be increased at this time until it is certain that any effect of the event has been prevented from reaching the water body or has passed through the waterbody. These management measures should ensure that water discharged from the development does not impact upon the primary contact recreational condition of the Myall River. Details of the proposed management actions are outlined within the Integrated Water Management report prepared by Cardno Willing (2008a) annexed within *Volume 3.*

Existing Water Quality

A water quality monitoring program for the existing detention lake was established in 1996. Samples are collected and analysed at five locations approximately every three months.

Sampling indicates that the lake water is brackish, consisting of a mean salinity of 12 g/L, which is approximately one third of the salinity of seawater. There is variability in the salinity concentration due to both catchment (freshwater) runoff as well as the influence of tides and varying salinity in the Myall.

The mean Dissolved Oxygen (DO) level within the lake for the sampling period is just below the recommended ANZECC trigger value of 5.0 mg/L for freshwater fish. The dissolved oxygen levels measured within the detention lake and the Myall River have been compared and the data shows the ANZECC high quality guidelines for dissolved oxygen are not currently met at all times, in either the lake or river (Copeland Ave Wharf). This data shows the dissolved oxygen levels in the existing lake are often better that in the Myall River.

The adopted ANZECC 2000 trigger value for Phosphorus (P) is 0.03 mg/L for estuarine systems. Most of the samples have been below the recommended value, with a mean of 0.02 mg/L. The ANZECC 2000 trigger value for Nitrogen (N) is 0.3 mg/L for estuarine systems. The samples measured have generally been low, contributing to the overall good water quality in the existing lake.

Most chemical indicators are below the ANZECC 2000 trigger values. The catchment is 90% undeveloped, with the existing treatment measures in the southern part of the catchment seemingly assisting with maintenance of good water quality with the existing lake. The technical data produced during the sampling period are detailed within the Assessment of Water Management Options dated September, 2004 prepared by Cardno Willing annexed within *Volume 3*.

Water Management Schemes

Seven water management schemes have been identified and assessed with respect to their strengths and weaknesses and impacts on the existing water quality of the Myall River catchment and are detailed in *Volume 3* (Cardno, 2008a). A combination of schemes 3 and 4 have been adopted (resulting in Scheme 5) which include extending the brackish water lake and including a series of freshwater lakes to provide the preferred water quality management system for the proposed development. The schemes are outlined below with technical data detailing the water modelling being correlated within the Assessment of Water Management Options dated September, 2004 prepared by Cardno Willing, annexed within *Volume 3*.

- *Scheme 1* - This scheme represents the implementation of the proposed development without any additional work to manage stormwater quantity or quality except the installation of measures to meet the requirements of BASIX for all new residential properties. This is the "Do Nothing" scheme. All stormwater flows to be piped into existing lake or discharged directly to wetland;

- *Scheme 2* - This scheme attempts to mitigate the adverse impacts of scheme 1 by increasing tidal flushing to combat water quality impacts and the provision of dry basins to help address detention and nutrient control;

- *Scheme 3* - This involves the extension (by 7.5 ha) of the existing lake to give a tidally flushed lake with water quality comparable to existing conditions. The extended lake would also partially meet the requirements for additional active detention storage;

- *Scheme 4* - Under this scheme a separate freshwater lake (12 ha) and / or equivalent area of water bodies would be constructed to treat stormwater from the new development prior to its discharge into the existing detention lake. This lake would be a window lake with an expected average water level slightly higher than the existing tidally flushed lake. The additional

lake / pond(s) would also include active storage to partially meet the retardation requirements;

- *Scheme 5* - This scheme is a combination of schemes 3 and 4. It would comprise the extension of the western arm of the existing tidally flushed lake as well as the construction of an additional freshwater lake or chain of ponds (total extension);

- *Scheme 6* - This is also a variation on Scheme 4. Instead of an additional shallow lake / pond(s) additional shallow lined wetlands would be constructed; and

- *Scheme 7* - This scheme is effectively scheme 2 with the benefit of swales. This scheme attempts to mitigate the adverse impacts of scheme 1 by increasing tidal flushing to combat water quality impacts and the provision of dry basins to help address detention and nutrient control (Cardno, 2004).

4.4.2 Myall Quays Detention Lake Sediment Sampling and Analysis

Lake sediments were investigated within the Myall Quays Detention Lake to look for the existence of a build up of nutrients and persistent chemical pollutants.

Coffey Geotechnics (Coffey) undertook fieldwork on the 5 October, 2007. The sediment sampling was assessed for contamination levels against the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).* Twenty-one (21) sediment samples were collected at locations within the lake. The sediment samples analysed from the lake show low heavy metal (Cr, Cu, Pb, Hg, Ni and Zn) concentrations which are below the adopted warning levels and may possibly be at background levels (Coffey, 2007b).

Organochlorine pesticides (OCP) and polychlorinated biphenyls (PCB) were not detected above the laboratory reporting limits. Polynuclear aromatic hydrocarbons (PAH) were detected at concentrations below the warning levels for this investigation. Nutrient concentrations (total nitrogen and total phosphorous) indicate they have not accumulated to levels typical of urban ponds and lakes (Coffey, 2007b).

Based on the sampling and analysis it appears that the lake is not acting as a "pollutant sink", showing little or no evidence of build up of pollutants within the lake bed. The Lake Sediment Sampling and Analysis report prepared by Coffey dated October, 2007 has established baseline comparison data for future development and monitoring of the sediments of the lake (Coffey, 007b).

4.5 WETLAND MANAGEMENT

The Wetlands Report prepared by Hunter Wetland Research (Winning, 2009) complements the ecological assessment undertaken by Conacher Environmental Group, (2008b) both of which are annexed within *Volume 3*.

The proposed 'Riverside' development covers an area of 229ha, approximately 101.3ha of which would be developed as residential, commercial and tourism facilities. The remaining 127.7 ha would be retained as open space parks, wildlife corridors and reserves. The reserved land includes approximately 49ha of wetland / wetland buffer, the vast majority of which would be retained and protected in recognition of their local and State significance. More than half of the wetland reserve is covered by *State Environmental Planning Policy 14 - Coastal Wetlands* (SEPP 14), and virtually all of the wetland area supports ecological communities that are listed as endangered under the *Threatened Species Conservation Act 1995* (TSC Act) (Winning, 2009).

4.5.1 *Wetland Environment*

The wetlands on the site form part of the floodplain of the lower Myall River, with strong estuarine tidal influences due to the close proximity to Port Stephens. The intertidal areas support characteristic estuarine wetland vegetation (mangroves and saltmarsh). The vegetation of areas dominated by freshwater inputs is influenced by the chemistry of the sandy soils, and is dominated by plant species that are characteristic of sandplains of the lower north coast of New South Wales (Winning, 2009).

4.5.2 *Development Impacts*

The *Great Lakes Local Environmental Plan 1996* (LEP) provides for the protection of wetlands on the site. The wetland covered by SEPP 14 is zoned '7(a) - Wetlands and Littoral Rainforest' and a broad band of freshwater wetland vegetation adjacent to the SEPP 14 Wetland is zoned '7(b) - Conservation', which is a less restrictive zone than the 7(a) zone (Winning, 2009). The proposed Riverside development is outside the SEPP 14 wetland.

Direct Impacts

The extension of the existing channel connected to the Myall River would result in the direct loss of approximately 150m^2 of wetland vegetation comprising *Juncus kraussii* and *Melaleuca ericifolia* scrub (Winning, 2009) (refer to *Volume 3* of the EA). *Section 4.7.2* provides additional information relating to the channel extension works and associated impacts.

Indirect Impacts

Developments adjacent to wetlands also have the potential to indirectly affect the wetland communities in a number of ways:

- changes in quantity and quality of surface and groundwater flows into the wetlands,
- human pedestrian and vehicular intrusion; and
- general 'edge effects', including:
  - predation of native fauna by domestic cats and dogs;
  - 'light spill' of street lights which can affect the behaviour of native animals;
  - dumping of rubbish and garden refuse;
  - 'weed creep' from lawn grasses, etc.; and
  - mowing of wetland margins (Winning, 2009).

4.5.3 Influences on Surface and Groundwater Quantity

Urban developments have more 'hard' impermeable surfaces than the natural communities, typically creating a greater quantity of stormwater flowing from developed areas. If these flows are directed into adjoining wetlands, the increased wetness can alter vegetation and habitats by giving a greater competitive advantage to plants that tolerate wetter conditions. Conversely, retaining the stormwater in some manner (e.g. in rainwater tanks) can lead to drier conditions in the adjoining wetland, again potentially altering the vegetation and habitats (Winning, 2009).

This issue is compounded on sites with highly permeable soils (e.g. sandy soils) such as the Riverside site. On these soils, infiltration of rainwater into the soil forms a groundwater table, the height of which at any time is determined by the quantity of infiltrated rainwater. Thus, measures to manage surface water flows by, for example, detention ponds can affect the groundwater by influencing the quantity of infiltration (Winning, 2009).

Changes in the quantity of catchment flows can affect the salinity of water and soils in the estuarine wetlands. An increase in catchment flows can lead to the lowering of salinity and a decrease in catchment flows can lead to an increase in salinity. Such changes in salinity can result in changes to the distribution of the various wetland communities. Surface water flows and groundwater levels are both naturally highly variable, and it is the 'average' influence that must be considered. In this context, relatively minor changes in groundwater levels are likely to be inconsequential with respect to the overall variability. However, persistent changes, even minor ones, such as a permanent decrease in average groundwater level, can lead to changes in vegetation (Winning, 2009).

4.5.4 Potential Groundwater Impacts

The groundwater chemistry at Riverside at Tea Gardens has been described by Coffey Geosciences (Coffey, 2004) and Coffey Geotechnics (Coffey, 2007a). Key findings of these reports are:

- salinity is related to proximity to the Myall River, with sites close to the river having a higher salinity;
- groundwater is slightly acidic - pH 5 to 6 (one site approximately pH 4); and
- levels of macronutrients (nitrogen and phosphorus) are generally low.

The most likely potential changes in water quality resulting from urban development is a reduction in groundwater acidity (i.e. an increase in pH), and an increase in macronutrients. Urban stormwater runoff tends to be circum-neutral (ca. pH 7), and discharge of such water into a naturally acidic system can dilute the acids and lead to an increase in pH. If this dilution is sufficient to raise the pH of the groundwater to around neutral, these conditions would give a competitive edge to plant species (and some animal species) that are presently out competed by acidophilic plant species. This would result in changes to the wetland communities (Winning, 2009).

The extension of the existing constructed lake would result in a substantial drawdown of average groundwater levels over much of the site, but the wetlands are essentially unaffected by this drawdown. The drawdown across the site may result in the area becoming drier on average, thereby encouraging the migration of saline groundwater further inland. The noticeable effect of these changes is likely to be a displacement of plant species that are competitive in the existing fresh and wetter conditions, such as *Melaleuca quinquenervia*, by species that are more competitive in drier and more saline conditions, such as *Casuarina glauca*. There is unlikely to be an overall loss in wetland vegetation but, rather changes in the distribution of different vegetation types. These changes are likely to be slow and occur over many years or even decades (Winning, 2009).

4.5.5 Potential Surface Water Impacts

Detailed modelling of the existing surface water conditions has been undertaken by Cardno Willing (2008a). Cardno Willing (2008a) found that the past construction of east-west drains has diverted historical north to south surface water flows across the site in an easterly direction into the wetlands. This historical change was quantified as an increase to an annual average of approximately 704 ML/yr from an annual average of approximately 148 ML/yr. It is important to note that these are average values and that the actual runoff into the wetlands would vary from year to year, and would be sporadic during any year (Winning, 2009).

Under the proposed post-development conditions the average annual runoff into the wetlands would be approximately 480ML/yr. This represents a reduction from existing flows. However, this is unlikely to have a noticeable impact on the wetland vegetation, as this vegetation is predominantly determined by groundwater levels, which are predicted not to change substantially on all but a small part of the wetlands (Coffey 2008a).

Both the estuarine and freshwater wetlands on the site are subject to surface flooding (tidal and flood inundation from the river, and stormwater flows from the catchment). However, the dominant chemical influence on the wetlands is the quality of the groundwater, largely because any surface water flooding quickly infiltrates through the sandy soil, and the groundwater is always present (Winning, 2009).

Levels of macronutrients in stormwater runoff from urban areas are characteristically high relative to undeveloped conditions. These elevated nutrient levels derive from a number of potential sources, including:

- fertilisers used on lawns and gardens;
- top soil and other introduced soils with a high clay or silt content;
- organic particulates, such as from leaf mulch;
- dumped organic matter, including lawn clippings, and bread and grain fed to waterbirds;
- faeces of domestic dogs and cats; and
- detergents from car washing, etc.

As with changes in pH, an increase in macronutrients levels can give a competitive advantage to plant species that are presently not abundant or are absent. In extreme cases, very high levels of macronutrients can lead to eutrophication of surface waters - copious growth of algae and macrophytes, the decomposition of dead litter from which can lead to depleted oxygen levels and death of aquatic fauna (Winning, 2009).

4.5.6 Modelled Impact on Groundwater and Surface Water Quality

Both the surface water modelling (Cardno, 2008a) and the groundwater modelling (Coffey, 2007a) predict a reduction in pollutant loads (suspended solids, total nitrogen, total phosphorus) in water flowing into the wetlands. This is the result of the integrated water management scheme proposed (Cardno Willing, 2008a) which includes measures to intercept and treat potentially polluted surface water runoff. Accordingly, there should be no impact on the wetlands resulting from the modelled pollutants.

The reduction of surface flows into the wetland, and the consequent increase in influence of lower pH groundwater flows, should obviate any potential

reduction in acidity that may affect vegetation and 'Wallum' fauna species (Winning, 2009).

4.5.7 Human Interaction with Wetland Areas

Uncontrolled access into wetlands has the potential to impact the wetlands through trampling of vegetation, dumping of rubbish, etc. However, it is considered important to encourage controlled access into the wetlands to increase public appreciation of wetlands and their ecological values, as well as to discourage undesirable activities through increased public visibility of natural areas. Accordingly, a Wetland Management Plan to better manage the human interaction with the Wetland environments should be prepared to indicate whether appropriate access points, tracks, boardwalks, interpretation facilities, etc. should be permitted and specify measures to limit access into other areas (Winning, 2009).

4.5.8 Integrated Water Management

To address the potential impacts to the SEPP 14 Wetland and adjacent wetland buffer, an Integrated Water Management Strategy has been developed (Cardno Willing, 2008a) (refer to *Volume 3* of EA) to manage the groundwater and surface water flows. The management of the groundwater and surface water flows should mitigate any impacts on the wetlands resulting from the potential pollutants identified.

4.5.9 Management of the Wetland

An Ecological Site Management Strategy has been prepared which details management strategies to protect the long term environmental and ecological values of land within Riverside, including the management of the wetland area (refer to *Section 4.12.8*). In addition, the Wetland Assessment completed by Winning (2009), recommends the preparation of a Wetland Management Plan specifically to manage the potential environmental impacts associated with channel extension works, rehabilitation of the channel following works and ongoing monitoring. The Wetland Management Plan should include, as a minimum, the following:

- a detailed description of how the works would be undertaken;
- a description of measures to be adopted to mitigate compaction or other damage to the substrate, that may affect restoration,;
- a description of measures to be adopted to avoid collateral impacts, such as lateral movement of sediment and inadvertent intrusion by plant into the saltmarsh outside of the construction strip;

- a description of measures to be adopted to rehabilitate the disturbed areas, including confirmation of levels, planting &/or propagule placement, etc.; and

- details of an ecological monitoring program to be implemented to assess and report of the progress and success of the rehabilitation.

4.6 CANAL ESTATE DEVELOPMENT

As set out in *Section 3.3.5*, a legal opinion has been obtained (refer to *Annex G* of *Volume 1*) which confirms that the proposed extension of the existing detention lake would not represent a canal estate development within the meaning of clause 3 of SEPP 50.

The existing residential development at Myall Quays incorporates an artificial waterbody which was created to provide an appropriate stormwater detention system to control the rate of runoff into the Myall River from the residential development. The proposed extension of this water body is required to cater for drainage from the development of Riverside. Several different water management options have been investigated for the site and the preferred scheme, involving the extension of the existing detention lake by 2.0ha and the inclusion of three (3) separate freshwater detention ponds, is considered to be consistent with the intent of SEPP 50 to permit appropriate water management structures.

4.7 LAND/WATER INTERFACE

4.7.1 Land/Water Interface (Residential)

The concept plan and project application maintains the wetland and buffer to the wetland adjacent to the residential areas. A total of approximately 28 hectares of wetlands (zoned 7(a) Wetlands and Littoral Rainforest) will be retained. A 21 hectare buffer (zoned 7(b) Conservation) will separate the residential area from the wetlands. Land within the buffer will not be developed for residential purposes.

Public Access

A foreshore park within the north east section of the 7(b) Conservation lands will be created for the purposes of providing community facilities and public access to the Myall River foreshore. The park and associated pathways establishes a buffer between the Myall River and residential development.

Controlled public access will also be provided in proximity to the Myall River and SEPP 14 Wetland through the construction of pathways adjacent to, but

not within the 7(b) Conservation zone. The location of the pathways will facilitate public access, whilst protecting the SEPP 14 Wetland and wetland buffer (conservation land) from informal public access. An asset protection zone to be constructed within the 2(f) zone, adjacent to the 7(b) conservation lands will provide additional separation to the conservation area, thereby minimising edge effects.

Bank Erosion

Development on the banks of the Myall River is limited to the extension of the existing drainage channel connected to the Myall River to the water detention lake and thus the potential for bank erosion is limited to this area. However, there is potential for sedimentation of the Myall River associated with the development of the site. As detailed in Section 4.3, water management at the site, including the extension of the existing detention lake and the construction of a number of ancillary water quality control basins and ponds to create a 'treatment train' for runoff prior to discharge, together with erosion and sediment control measures, will minimise the potential impact of sedimentation.

4.7.2 Land / Water Interface (Extension of Existing Drainage Channel).

Channel Extension Methods

The existing drainage channel connecting the lake to the Myall River is proposed to be retained and another connection is proposed to be constructed. No works are proposed within SEPP 14 Wetlands. The use of dredge is proposed during construction of the proposed new channel as it provides the least environmental impact of all the construction methods considered.

The proposed construction method is discussed below:

- construction works will be short term, occurring over a period of two days;
- approximately 60m^3 of material, including 150m^2 of vegetation removal will occur as a result of the creation of the new drainage channel; and
- the proposed construction method involves the use of a small dredge which will be floated out to the site on a barge. The existing temporary water treatment pond constructed for Stage 5 could be utilised to contain and treat the dredge water.

Erosion and sediment control measures for these proposed works are detailed within the Construction Environmental Management Plan (ERM, 2009) (refer to *Volume 3*). These works will include sediment fencing on each side of the excavation, a straw bale sediment trap across the front of the existing channel and a sediment curtain around the excavation area and along the length of the lake edge to the spoil area.

Acid Sulphate Soils

Prior to the commencement of channel extension works, the pH level of the soil will be tested to determine whether acid sulphate soils are present. Should they be present, the mitigation measures detailed in the Acid Sulphate Soil Management Plan (refer to *Volume 3*) will be implemented.

Ecological Impacts

As detailed within *Section 4.5.2*, the extension of the existing channel would result in the direct loss of approximately 150m² of wetland vegetation comprising *Juncus kraussii* and *Melaleuca ericifolia* scrub (Winning, 2009) (refer to *Volume 3* of the EA).

Mitigation Measures

In order to minimise potential impacts associated with the channel extension works, a Wetland Management Plan will be developed and implemented as detailed within *Section 4.5.9*.

4.8 FISHING AND AQUACULTURE

4.8.1 Fish Community

A number of studies have been undertaken to gauge the health and diversity of the fish community of the existing artificial lake. These studies include a survey which was undertaken in April 2007 and form part of a series of biological studies to record the aquatic ecological development of the lake (Harris Research, 2007). Survey results from 2007 indicate that the number of fish species and individual fish have increased from previous studies. In comparison, the distribution patterns and occurrence of aquatic plants in the lake were similar to those recorded in 2002.

The 2007 report found evidence of increasing biological diversity and abundance of fish activity which indicates that the lake is continuing to develop towards a sustainable aquatic system. The report indicated that habitat conditions, water quality and the food web are continuing to develop, indicating that the lake is supporting higher numbers of fish stock and is exhibiting increasing productivity.

The report recommended that the previous recommendations contained within the Harris Report (2002), should be adopted. Previous recommendations include increasing the amount and quality of aquatic habitats with respect to increasing the extent, complexity and quality of near-shore habitats for fish, invertebrates and birds. These recommendations for

optimising the quality of aquatic habitats, which are incorporated in current proposals to extend the lake area, include:

- influencing the water-quality regime to increase habitat diversity and stability;
- continuing effective management of the series of runoff-treatment ponds;
- increasing variability of depth profiles by introducing physical structures such as submerged logs, rockwork or other artificial reefs;
- experimentally introducing indigenous submerged and emergent aquatic plants and planting littoral trees, shrubs and grasses; and
- introducing shoreline complexity in newly created waterway areas.

The proposed development at Riverside will ensure that a high standard of water quality is maintained, thereby ensuring the attractiveness of the lake as a fish breeding area.

The planned circular enlargement of the lake and incorporation of the above recommendations would increase tidal ventilation and reduce water-quality variability as well as improving the availability of habitats and food for aquatic and water-associated plants and animals.

These initiatives will ensure the Riverside lake system will continue to contribute to environmental assets of the Tea Gardens area.

4.8.2 Oyster Leases

The Department of Primary Industries' (DPI) Oyster Industry Sustainable Aquaculture Strategy (OISAS) (DPI, 2006) identifies current active oyster leases in close proximity to the Riverside development that need to be protected. Water discharge from the Riverside development needs to be managed in order to minimise potential impacts on the oyster leases. Active oyster leases in proximity to the Riverside site are due to be phased out by 2018, being the end of the current lease period. The leases may be active at any point in time between now and the end of the lease period and therefore the potential impact of the Riverside development on the oyster leases due to water discharge from the site needs to be assessed and mitigated. The Riverside at Tea Gardens development incorporates a water treatment train, including the use of ponds and artificial wetlands to minimise water quality impacts from the proposed development. *Section 4.4* identifies water quality objectives, as well as mitigation and monitoring measures to be implemented to manage stormwater at the site. Given these water management initiatives it is not anticipated that there will be any water quality impacts within the Myall River and therefore the oyster leases will not be negatively impacted in any way.

4.9 SOILS AND CONTAMINATION

4.9.1 Acid Sulphate Soils

A geotechnical assessment which investigated the potential for acid sulphate soils on site was carried out by Coffey Geotechnics Pty Ltd (2008). The investigations relate specifically to the land that is the subject of the project application. It is expected that the subsurface conditions in the south and eastern parts of the site will be similar to those encountered during the geotechnical assessment. The land to the north and north west will be subject to further detailed geotechnical investigations as part of project application for future stage.

According to the Acid Sulphate Soils Risk Map for Port Stephens the site is located in an area where there is a low probability of acid sulphate soil materials occurring between one metre and three metres below the ground surface. The map indicates that acid sulphate soil (ASS) materials, if present, are irregular and may be buried by alluvium or windblown sediments (Coffey, 2008).

Screening testing indicated the following.

- pH values in 1:5 soil to distilled water mix ranged from 4.09 to 7.68. A pH of <4 can indicate the presence of actual ASS;
- pH values of soil in 30 percent H_2O_2 were between 1.43 to 5.77. A pH of <3 can indicate the presence of potential ASS;
- a maximum pH change of 4.99 after oxidation with H_2O_2 was recorded. Significant pH changes (>2) after oxidation with H_2O_2 can indicate potential ASS. pH changes >2 were recorded in 19 of the 105 samples screened for ASS;
- slight to moderate effervescence was observed in 29 of the 105 samples tested. Vigorous effervescent reactions with oxidation in 30 percent H_2O_2 can indicate potential ASS;
- an odour was released upon oxidation with H_2O_2 in 18 of the 105 samples tested. A sulphurous odour is often associated with oxidising potential ASS; and
- temperatures of 19.5 to 33 degrees were recorded in all H_2O_2 oxidation screening tests. Generally the oxidation of significant quantities of pyrite in this test will generate temperatures to >60 degrees Celsius.

Results from laboratory testing for SPOCAS / SCR Suite analysis indicated that 19 of the 28 samples tested exceeded the Acid Sulphate Soil Management Advisory Committee action criteria. Therefore, an Acid Sulphate Soils Management Plan has been prepared as part of the Coffey report (2008), and relates to future earth works at Riverside. The plan provides a reference to all

lot purchasers and contractors required to work on the site (Coffey, 2008). As detailed within Engineering Drawing Sheet 69 within *Volume 2*, with the exception of the construction of the water detention lake basins and ponds, the majority of the Riverside site will be subject to filling in order to obtain required grades. Therefore, there is limited potential for the exposure of acid sulphate soils in these areas.

4.9.2 Contamination

A Phase 1 Environmental Site Assessment (ESA) has been undertaken (ERM, 2008a) to identify potentially contaminating activities that have previously, or may currently be occurring on the Riverside at Tea Gardens site. Key findings of the assessment are summarised below. The full assessment report is presented in *Volume 3* of this EAR.

The following was noted during the assessment:

- the title search review undertaken as part of the assessment did not identify potentially contaminating activities on the site; and
- a limited risk might exist as parts of the site were previously used as a commercial pine plantation. Therefore, impact due to fertilizer and/or pesticides cannot be excluded or that minor oil and/or fuel spills from machinery might exist on the site.

Pesticide use in pine plantations is usually confined to the first two years of a plantation crop cycle. Furthermore all chemical pesticides used in commercial pine plantations in Australia are also used in general agriculture (Forest and Wood Products Research and Development Corporation, 2006). Therefore the potential impact to the site from the use of pesticides associated with the former pine plantation is considered to be minor.

The assessment identified that the greatest potential for potential transport mechanisms and pollution linkages on the site is via the shallow groundwater aquifer. The shallow aquifer is unconfined and is considered to have significant potential to act as transport mechanism for the offsite migration of contaminants. A secondary transport mechanism is considered to be the potential for airborne migration of contaminated soil due to wind erosion. The secondary transport mechanism is considered to have minor potential only, as the site surface is well vegetated and the potential for wind erosion is therefore low.

The assessment considered the risks of potential contamination on identified 'receptors', including persons (residents, future residents, patrons, workers and off site persons), water supply and wells, and the Myall River that are or may be adversely affected by the chemicals of concern.

The assessment identified the following:

- the site was assessed as being free of potential contaminants or past and present contaminating activities likely to have a significant adverse impact on human health or the environment;

- the site, although disturbed in parts by former use as a commercial pine plantation, is currently free from development;

- no evidence of former development was noted; and

- as the site is largely uncontrolled it cannot be discounted that illegal dumping of potentially contaminating materials has occurred, however based on the information reviewed it is considered that the potential for such dumping is low.

Potential for existing site contamination therefore is considered to be low and if encountered, contamination is likely to be limited in extent to localised zones within the site. Therefore the site is considered to have low potential to adversely affect human health or the environment either on surrounding properties or local receiving waters. The Phase 1 ESA undertaken for the Riverside at Tea Gardens site did not identify any significant potential for site contamination. The site is therefore considered suitable for the proposed development.

4.9.3 Excess Soil

Construction Excess Soil

The development of Riverside at Tea Gardens will generate excess topsoil associated with the construction of the water storage lake, basins and ponds and the extension of the existing drainage channel which is connected to the Myall River. The total amount of spoil to result from the construction of Riverside at Tea Gardens project application area is approximately 460,200m^3 as detailed in the Bulk Earthworks Plan (refer to Sheet 11, Engineering Plans within *Volume 2* of the EA).

Earthmoving operations consisting of excavators and trucks will remove the soil during construction and will transport the material within the Riverside at Tea Gardens site for reuse on site. Excess topsoil is proposed to be stockpiled for reuse on the site of the sporting complex proposed on the adjacent Myall River Downs site.

Soil Reuse

Approximately 422,200m^3 of the excavated soil is able to be contained through utilisation on site as detailed within the Bulk Earthworks Plan (Sheet 11, *Volume 2*). The soil will be utilised on site for the following purposes:

- filling and shaping in areas of the site where fill material is required, including roads, east / west drainage basin, commercial site regrading, allotments, level spreader and diversion bank construction;

- the creation of earth mounds proposed to be constructed between the Riverside at Tea Gardens construction site and existing residences within the adjacent Myall Quays residential area. The earth mounds will be created at the commencement of construction of the water detention lake as a noise mitigation measure and following construction the mounds will be reshaped to remove the mound and provide a landscaped area adjacent to the water storage lake; and

- shaping of landscaped and open space areas throughout the Riverside at Tea Gardens site.

There will be approximately 38,000m^3 of excess topsoil. This excess topsoil is proposed to be stockpiled for reuse at the proposed sporting complex on the western side of the Myall Way. All haulage of excess topsoil to the sporting complex site will be in accordance with the Traffic Control Plan and haulage route detailed in Sheet 67 of the Project Application Engineering Drawings provided in *Volume 2* of the EA.

Planning provisions that apply to the reuse of the excess topsoil on the site of the proposed sporting complex on the western side of the Myall Way are detailed in *Section 3.2.7.*

4.10 ABORIGINAL CULTURAL HERITAGE VALUES

An Aboriginal Heritage Assessment (the Assessment) was undertaken by ERM (2008b) (refer to *Volume 3* of the EA), which addressed the DECC Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation. The Assessment identified that the majority of the site was cleared in 1932 for a pine plantation which was burned in 1979 and not maintained (ERM, 2008b).

A desktop analysis of the Aboriginal Heritage Information Management System (AHIMS) Aboriginal Site Database located 31 significant sites within the search area which included the Riverside site and surrounding areas. One midden site (NPWS 38-5-148) was identified within the Riverside site area and two (2) middens sites were identified 300 metres to the south of the site. The remaining significant sites were located more than 1.5 km from the Riverside site scattered throughout the Port Stephens catchment. A strip of wetland area along the Myall River and a small area in the north eastern corner of the site were also identified as potential archaeological sites.

Archaeological surveys carried out by Dallas (1982) and Brayshaw McDonald Pty Ltd (1987) identified an archaeological site, which incorporated four occurrences of shell midden within a 220 metre by 40 metre strip along the bank of the Myall River (Gardner Brown Planning Consultants et al, 1991).

This was recorded as NPWS 38-5-148 in the Kinhill 1994 report and is shown in *Figure 2.1* of the *Aboriginal Heritage Assessment*, (ERM, 2008b) attached to *Volume 3.* It was previously assessed by Brayshaw (1988) as having high archaeological significance and recommended for protection (Kinhill, 1994).

This archaeological site will not be impacted by the proposal as it is located within the SEPP 14 Wetlands, which will not be subject to development. As this site is not to be disturbed no further assessment was completed as part of this EA.

Two other sites (NPWS Site No 38 – 5- 76 and NPWS Site No 38-5-147) were previously identified and investigated as part of the 'Myall Quays' development, immediately south of the subject land (Kinhill, 1994). These sites are located in the Myall Quays development and outside the concept plan area.

DECC released an Interim Community Consultation Requirements Guideline (2004) for Aboriginal consultation in relation to any study area that might eventually be used to support an application under *Part 6* of the *National Parks and Wildlife Act 1974*. (ERM, 2008b) In accordance with the Interim Guideline ERM invited Aboriginal groups to register as a party to the consultation process.

A letter requesting advice from Aboriginal groups regarding any known heritage issues was sent on the 4 May, 2007 to the DECC, Registrar of Aboriginal Land Rights Act 1983 (NSW), Great Lakes Council and Karauh Local Aboriginal Land Council (KLALC). DECC and the Registrar identified additional groups which were included in the consultation process.

A local press advertisement was placed in the Myall Coast Nota newspaper on the 10 May, 2007 inviting any Aboriginal groups to be involved in the consultation process. One response to the advertisement was received and included in the consultation process.

A search of the Native Title Tribunal website on the 4 May, 2007 failed to reveal any active claimant applications in the study area.

A total of three responses were received from KLALC, Jan Webb and the Interim Board of Management for Worimi Conservation Lands. Maaiangal Cultural & Heritage identified the study area as being outside their area of interest.

The three parties that registered an interest were provided with a proposed desktop assessment methodology in June 2007 and a survey methodology in March 2008. Verbal responses to these methodologies were received from KLALC and Jan Webb, each indicating their agreement. Field survey was undertaken in accordance with the agreed methodology on Monday 21 April 2008 with two representatives of the KLALC.

The consultation process is detailed in Annex A of the Aboriginal Heritage Assessment (refer to *Volume 3* of EA). A copy of the Aboriginal Heritage Assessment was sent to the registered Aboriginal parties for comment on the content and recommendations. This review process is appended to the Aboriginal Heritage Assessment Report.

The field investigations undertaken on 21 April 2008 recorded one new midden site located on a sand dune in close proximity to the SEPP 14 wetland and wetland buffer within the proposed tourist precinct (refer to *Figure 6.1* of the Aboriginal Heritage Assessment Report (ERM, 2008b) in *Volume 3*). The midden is located within a paddock and shows signs of disturbance (broken shells on the surface). Given the level of disturbance, this midden is considered to have moderate significance only. Further investigations would be required to confirm the extent, depth and contents of this site should development be proposed within 10 metres of its current extent.

Given the potential depth of deposit and the range of shell species represented (cockle, oyster, whelk and pipi) within the midden site previously identified by Brayshaw McDonald (1988) (site 38-05-0148), the site is recognised as having high archaeological significance. Given its location within a protected SEPP 14 wetland it is likely to continue to survive with only minimal disturbance, which further emphasises its significance within the region (Brayshaw McDonald, 1988).

Neither the newly identified midden nor that previously recorded by Brayshaw McDonald (1988) will be directly impacted by the proposed development, however ancillary or indirect impacts may occur. Alterations to drainage patterns could accelerate erosion of the deposits and greater visitation (on foot and vehicular) may cause damage or erosion. To ensure that indirect impacts do not damage the middens (in particular the recently identified midden located within the proposed tourist precinct, ('Riverside_01'), the following recommendations will be implemented on site:

- Riverside_01 should be protected on all sides by a minimum 10 metre buffer. No construction/excavation works, including the storage of machinery should impinge on this buffer zone;

- a management plan should be developed in consultation with the local Aboriginal community to ensure the long-term protection of the middens. This management plan should consider the use of fencing, designated walkways and interpretive signage at Riverside_01 as an educational resource. No development or excavation works should be undertaken within the tourist precinct until this management plan has been finalised and approved by the Karuah LALC and DECC;

- based on the location of site 38-05-0148 within the protected SEPP 14 Wetland and associated buffer zones, no further protection measures are required;

- based on the predictive modelling and confirmed by field survey it is likely that a consistent low-density scatter of midden material is likely to occur within the eastern portion of the study area. This area will be protected within the SEPP 14 Wetland and associated buffer zones and no specific management measures or monitoring is recommended;

- the remainder of the study area has limited potential for additional sites to be recorded and no specific management measures or monitoring is recommended from an archaeological perspective. Following consultation with the local Aboriginal community, monitoring of clearing and initial excavation works has been recommended by the Karuah LALC. This would not be undertaken as an archaeological activity; and

- a suitable area should be set aside for the possible containment of any cultural heritage material that is uncovered during the construction works. This dedicated 'keeping place' would only be required in the event that material is uncovered and would be under the care and control of the local Aboriginal community.

4.11 BUSH FIRE

Part of the site is mapped as bush fire prone land in the Great Lakes Council bush fire prone land mapping. It is categorised as having a Forest Fire Danger Index (FDI) of 80 and therefore Table A3.4 of *Planning for Bush Fire Protection, 2006* was used to determine appropriate asset protection zones.

The potential bush fire threat was identified from Dry Sclerophyll Forest vegetation to the north of the site. A reduced risk is present to the east of the site comprising the Forested Wetlands and Saline Wetlands. A greatly reduced risk is present from the west and south west as a result of cleared grass land, scattered trees, industrial land use and existing residential development (Conacher Environmental Group, 2008a) (refer to *Volume 3*).

The proposal incorporates a range of bush fire mitigation measures, including Asset Protection Zones (APZs), which were determined in accordance with NSW Rural Fire Service (2006) guidelines, building construction standards, hazard management, evacuation routes, availability to fire fighting services, water supply and communication.

4.11.1 Asset Protection Zones

The required APZs for residential development and development identified as special fire protection purposes (which includes tourist development)are outlined in *Tables 4.2* and *4.3* and are as detailed within the *Planning for Bush Fire Protection Guidelines* (RFS, 2006).

Table 4.2 Asset Protection Zone Requirements for Residential Development

Table 1 Bushfire Attack and APZ requirements for Residential Development						
Direction	Vegetation within 140m	Effective Slope Gradient	Minimum APZ (m)	Bushfire Attack APZ Range (m) Construction Standard		
				Level 3 (High)	Level 2 (Medium)	Level 1 (Low)
North west	Pasture Managed Grassland	0-5 U	No requirement	-	-	-
North to North west	Dry Sclerophyll Forest	0-5 U	20	-	25-35	35-100
East	Forested Wetlands	0-5 D	20	17-24	24-34	34-100
South-South east	Saline Wetlands	0-5 D	No requirement	-	-	-
South	Residential	0-5 D	No requirement	-	-	-
West	Pasture Industrial	0-5 D	No requirement	-	-	-

*Construction Standard AS 3959
U = Upslope
D = Downslope

Source: RFS, 2006

Table 4.3 Asset Protection Zone Requirements for Special Fire Protection Purposes

Table 2 Bushfire Attack Assessment Tourist Units (Special Fire Protection Purposes)			
Direction	Vegetation within 140m of Development	Effective Slope Gradient	APZ (m)required
North to North east	Managed Lands/ Residential development	0-5 U	Nil
East	Saline Wetlands	0-5 D	Nil
South	Forested Wetlands	0-5 D	60 metres*
South west	Forest	0-5 U	60 metres*
West	Forest	0-5 U	60 metres*

The APZs will be measured from the building line of the development. Fuel management within the APZs will be regularly maintained in accordance with a site specific fuel management plan as generally described in *Planning for Bush Fire Protection, 2006*.

4.11.2 Construction

Construction standards set out in the Australian Standard AS3959 *Construction of Buildings in Bush Fire Prone Areas* will apply to the future development.

Exposed areas of the future residential development will be constructed to a Level 1 or 2 construction standard to protect against bush fire attack depending on the width of the chosen APZ (Conacher Environmental Group, 2008a).

4.11.3 Hazard Management

The managers/owners of the lot/s will have an ongoing liability to ensure the management of the APZs within the property to prevent the build up of combustible fuel.

Section 63(2) of the Rural Fires Act states that '*it is the duty of the owner or occupier (including Councils) of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land*'. A site specific fuel management plan should be developed in accordance with the *Planning for Bush Fire Protection, 2006* to properly manage regular maintenance.

There is no physical reason that should constrain hazard management in any potential asset protection zone from being successfully carried out by normal means e.g. landscaping /mowing / slashing following initial clearing works (Conacher Environmental Group, 2008a).

4.11.4 Evacuation Safety

The proposal provides evacuation routes from the proposed development during a bush fire. The proposal includes two access points to Myall Street, including the existing access point at Shoreline Drive. From Myall Street safe egress is available to the north and south, to areas that provide adequate separation from the surrounding bush fire threats. The concept plan also provides two separate access points to Toonang Drive, which has direct access to Myall Street.

4.11.5 Availability and Access to Fire Fighting Service

The site is in close proximity to two rural fire services. The closest Rural Fire Brigade is located in Tea Gardens, approximately three kilometres to the site. This fire brigade would have a response time of 10 – 15 minutes if they were not assisting elsewhere. There is also a Rural Fire Service located at Bulahdelah to the north. They would have a response time of 30-45 minutes if they were not assisting elsewhere.

All access requirements are to be compliant with the provisions of the *Planning for Bush Fire Protection, 2006.* The proposed internal road layout and connection to existing road provides adequate access / egress for emergency services.

4.11.6 Water Supply and Communication

Reticulated water is available to the site therefore additional supplementary water supply for fire fighting purposes will not be required. Hydrants will be installed in accordance with Australian Standard AS2419-1 (1964). Access points for reticulated water supply are to incorporate a ring main system for all internal roads.

Telephone communication is also available to the site, which will assist in communications during a bushfire.

4.11.7 Bush Fire Evacuation Plan

A Bush Fire Evacuation Plan should be prepared and incorporated into the Community Management Statement.

4.12 FLORA AND FAUNA

An ecological impact assessment of the proposal, in accordance with Part 3A of the *EP&A Act,* was undertaken by Conacher Environmental Group (2008b). The assessment was undertaken to determine the extent of potential impacts to threatened species and endangered ecological communities listed under State and Commonwealth legislation and to ensure appropriate safeguards and strategies are put in place to avoid, mitigate and/or ameliorate potential impacts on ecological resources. Methodology employed and key findings of the assessment are summarised below. The full assessment report is presented in *Volume 3* of this Environmental Assessment Report.

Preliminary background literature reviews and database searches were undertaken, including database searches for threatened species listed under the TSC Act previously recorded within a 10 km radius of the site (the 'locality') and review of existing vegetation mapping. Aerial photographs were also reviewed and a number of ecological and environmental reports previously completed for the site were also reviewed. Field investigations were also carried out at the site by Conacher Environmental Group (2008b).

4.12.1 Existing Environment

Vegetation

Vegetation at the site is described as a mosaic of disturbed pasture with scattered trees and a number of woodland/open forest communities.

A large remnant of naturally vegetated swamp forests, heaths and estuarine vegetation communities, associated with the Myall River occur within the eastern portion of the site. These wetland communities have been mapped in detail by Winning (2009) (refer to *Volume 3* of this EA) and include a variety of estuarine, brackish and freshwater communities. Wetland communities identified in the eastern portion of the site include:

- disturbed estuarine edge communities (Strand wrack and weedy dredge spoil and *Casuarina* flat);
- intertidal estuarine communities (*Sarcocornia – Juncus* saltmarsh, *Juncus* saltmarsh and mangroves);
- brackish communities (*Baumea* rushland); and
- freshwater communities (*Melaleuca quinquinervia* forest, *Eucalyptus robusta* open woodland and *E. robusta* forest).

Vegetation communities within the site are generally disturbed as a result of previous agricultural activity including grazing, underscrubbing and selective logging. A full description of each community including vegetation mapping showing the location of each community at the site is provided in the Ecological Site Assessment (Conacher Environmental Group, 2008b) within *Volume 3* of this EA.

Threatened Flora and Endangered Ecological Communities (EECs).

A total of 25 threatened flora species have previously been recorded within the locality. Nine species were considered to have the potential to occur at the site based on the presence of suitable habitat. No threatened flora species were identified within the subject site during field investigations (Conacher Environmental Group, 2008b).

No endangered flora populations as listed in the Threatened Species Conservation Act have been recorded at the site or in the locality.

Consideration was given to the presence of EECs at the site that are known to occur or have the potential to occur within the Great Lakes LGA. Three EECs, being Coastal Saltmarsh, Swamp Sclerophyll Forest on Coastal Floodplains and Swamp Oak Floodplain Forest were identified within the subject site.

Large areas of the EEC Coastal Saltmarsh were observed within the eastern section of the site associated with supratidal and tidal flats along the western boundary of the Myall River. Two vegetation communities identified within the study area are considered to be representative of the endangered ecological community, Coastal Saltmarsh. These were Rushland (*Baumea juncea*) and Saltmarsh (*Juncus kraussii*) which have been mapped as occupying approximately 24.9 hectares within the Riverside site. These communities will be largely conserved within the site's conservation and wetland zones however, approximately 0.015 hectares of the Saltmarsh (*Juncus kraussii*) and *Melaleuca ericifolia* vegetation communities will be impacted by the proposed extension of the existing drainage channel linking the detention lake to the Myall River within the 7(a) zone.

The EEC Swamp Sclerophyll Forest on Coastal Floodplains was identified as occurring predominantly within the eastern portion of the site adjacent to the Coastal Saltmarsh EEC and also within small areas occurring in localised depressions within the central and northern parts of the site. Three vegetation communities identified within the study area are considered to be representative of this EEC. These were Woodland / Open Forest (*Eucalyptus robusta*), Scrub (*Melaleuca ericifolia*) and Paperbark Forest (*Melaleuca quinquenervia*). Approximately 27.4 hectares of this ECC will be retained, restored and protected, however approximately 21 hectares will be modified and / or removed by the proposal.

The EEC Swamp Oak Floodplain Forest was identified in the eastern part of the site within the 7(a) wetland zone and the mapped vegetation community Casuarina Forest (*Casuarina glauca*) is a highly disturbed regrowth variant of the EEC. The EEC occupies appropriately 1.2 hectare within the Riverside site and will be completely retained and restored as part of site specific vegetation management and offset strategies.

4.12.2 Fauna Habitat

The site supports a diverse assemblage of native mammal, reptile, bird and frog fauna. A total of nine mammal species, 78 bird species, five reptile species, eight bat species, 13 frog species and two aquatic species were recorded on the site during the 2007/2008 surveys Seven threatened fauna species, the Wallum Froglet, Osprey, Barking Owl, Grey-headed Flying-fox, Squirrel Glider, Little Bentwing-bat, and Eastern Freetail-bat , as listed within the TSC Act, were observed within the Riverside at Tea Gardens site, with a number of other fauna species recently recorded within the Tea Gardens area as part of other studies, including Powerful Owl, Masked Owl, Koala, Eastern Chestnut Mouse and Eastern Pygmy-possum. The following threatened fauna species were observed within the site during previous surveys, however these have not been recorded within the last five years despite extensive fauna surveys: Greater Broad-nosed Bat, Large-footed Myotis, Eastern Bentwing-bat, Common Blossom-bat and Koala.

A range of fauna habitats are present within the site reflecting the diversity in the vegetation communities present. However, past disturbance including removal of ground cover and shrub layer vegetation through grazing and slashing has decreased the value of much of the area as habitat for native fauna.

Areas of the site are prone to ponding after rain providing suitable habitat for a range of amphibian species. The drainage depressions associated with tracks and tree removal holes contain suitable foraging and breeding habitat for these locally occurring amphibian species.

The denser, less disturbed vegetation types associated with the Myall River wetlands provide higher quality habitat due to the increased density and diversity of the various structural layers. These less disturbed habitats provide increased foraging, refuge and breeding opportunities for mammal, bird, reptile and amphibian species. This is reflected in the species richness of these vegetation types in comparison to the majority of the site containing the disturbed vegetation communities. These higher quality vegetation and habitat types will be retained as part of the proposed development.

Connectivity and Local Distribution of Fauna Habitats

Areas of the site have been mapped within the Department of Environment and Climate Change's (previously Department of Environment and Conservation) Key Habitats and Corridor Mapping as Key Habitat. An area of the site has also been mapped as a regional corridor. This Regional Corridor extends to the north to State Forest and areas within Myall Lakes National Park and to the west to link with other Regional Corridors.

The habitats at the site are isolated to the south by Shearwater Estate and the Tea Gardens township and to the east by the Myall River. The highest degree of connectivity extends to the north of the site. The area to the north of the site consists of bushland of higher habitat quality due to decreased levels of disturbance. The site also shows some connectivity to similar, larger areas of vegetation and habitat to the west, including lands within Myall River Downs.

Threatened Fauna

Seven threatened fauna species were recorded at the site during the current study. Two endangered populations of native fauna have been previously recorded in the local area. These include the Emu Population in the NSW North Coast Bioregion and Port Stephens local Government Area and the Hawks Nest Tea Gardens Endangered Koala Population.

The Emu has not previously been recorded on the site or in adjacent areas of the site and it was not observed during the field investigations of the current study.

Targeted surveys for koalas and an assessment of koala habitat on the site were conducted during the current assessment. The details of these are provided in Conacher Environmental Group (2008c), (provided as Appendix 3 of the Ecological Site Assessment within *Volume 3* of this EA). The site was found to support koala habitat including four species of koala feed trees as listed on Schedule 2 of SEPP 44 – Koala Habitat Protection. However, no koalas, or evidence of koalas such as scats or scratches on trees were observed during the targeted surveys.

4.12.3 SEPP 44 – Koala Habitat Protection

The site is located within the Great Lakes LGA which is listed on Schedule 1 of SEPP 44 Koala Habitat Protection.

Despite the fact that koalas were not observed at the site, a Koala Habitat Management Plan was formulated in recognition of the conservation significance of the koala population occurring in the locality, the presence of koala habitat at the site and the potential for this species to occur at the site.

The Koala Habitat Management Plan (Conacher Environmental Group, 2008c) is provided as Appendix 3 of the Ecological Site Assessment in *Volume 3* of this EA. While there are no recent records for the Koala within the area to be developed and no evidence of recent use of the site has been detected, the planning, developmental and occupational phases of the proposed development need to consider the occurrence of the Koala within the local area. The presence of the Hawks Nest and Tea Gardens Endangered Koala Population within the area increases the importance of the management of the Koala in future planning decisions within the local area.

The works and measures detailed within the report in relation to Koala Habitat Management are designed to be carried out in conjunction with strategies developed for the ecological site management and bushfire protection.

Objectives of the Koala Habitat Management Plan have been developed to be consistent with the objectives and management actions of the Department of Environment and Climate Change (previously Department of Environment and Conservation) and Great Lakes Council as part of the Recovery Plan for the Hawks Nest and Tea Gardens Endangered Koala Population.

Key koala habitat management strategies at the site include:

- habitat protection - including the retention of areas providing potential foraging and refuge resources and movement corridors areas through the post development landscape. The location of these reserve areas are shown in the Concept Plan. Measures to be implemented to minimise impact on Koala habitat include temporary fencing to protect these areas during construction and signage to notify residents of restrictions to access and occurrence of potential Koala habitat;

- habitat restoration – including the retention and restoration of corridor and reserve areas and the retention and restoration of some higher quality, less disturbed vegetation types in the north and east of the site. Rehabilitation and vegetation protection strategies for the retained bushland areas are detailed in the site specific Ecological Site Management Strategy (Conacher Environmental Group, 2008d) provided as Appendix 4 of the Ecological Site Assessment in *Volume 3* of the EA;
- traffic management – including speed restrictions, warning signs and the regular maintenance of roadside vegetation to increase visibility of koalas potentially occurring at roadsides;
- dog management– including restriction of dogs to fenced yards and requirement for dogs to be restrained on-leash outside of yards;
- bushfire management – slashing of understorey vegetation in APZs in a manner that will not harm existing trees or seedlings;
- koala welfare and public education – including the distribution of information pamphlets to residents and the erection of signage indicating koala habitat in the area; and
- monitoring and reporting – including bi-annual monitoring of the koala population for ten years and assessments of habitat restoration and tree regeneration within regeneration areas.

All costs of the implementation of the management strategies detailed within this plan will be met by the applicant, future landowners or the Community Association. Where reserved lands are handed back to public ownership the relevant statutory authority will assume responsibility for any ongoing works.

4.12.4 SEPP 14 – Coastal Wetlands

The site contains an area of wetland mapped under State Environmental Planning Policy No. 14 Coastal Wetlands and known as Wetland No. 746. This area will be fully preserved as part of the proposed development. The SEPP 14 Wetland will be buffered from the development by the retention of vegetation communities between the wetland boundary and the development edge. This wetland buffer area is zoned 7(b) Conservation and will be retained as part of the Riverside development. Development within this zone is limited to a Foreshore Park within the north eastern portion of this zone outside of the wetland buffer area. Measures to protect and manage the wetlands are detailed in the Ecological Site Management Plan (Conacher Environmental Group, 2008d) provided in Appendix 4 of the Ecological Site Assessment in *Volume 3* of the EA.

4.12.5 EPBC Act listed Matters of NES

Matters of National Environmental Significance (NES) identified as potentially occurring in the locality include a wetland of International Significance

(Ramsar Site) (Myall Lakes) threatened flora and fauna species and migratory fauna species.

Myall Lakes is a wetland of international significance and is located within the locality. The site is situated approximately two kilometres downstream Myall Lakes National Park, near the lower reaches of the Myall River. The site is located on the western bank of the Myall River which is tidal. Incoming tidal flows pass the shores of the site on the way into the lake system.

Eighteen threatened bird species, two threatened frog species, four threatened terrestrial mammal species and six threatened plant species have the potential to occur within 10km of the site. Species that were wholly marine were not assessed as there is no suitable habitat within the site and the proposed development is not expected to impact upon them.

4.12.6 Impact Assessment

The proposed development will require approximately 126 hectares of vegetation to be removed or modified, however much of this consists of disturbed/cleared land. The concept plan proposes the retention, protection and management of approximately 78 hectares of vegetation including areas of the endangered ecological community Coastal Saltmarsh and areas within SEPP 14 wetlands (Conacher Environmental Group, 2008b, *Volume 3* of this EAR).

An assessment of potential impacts of the proposal on threatened species recorded or considered likely to occur on the site was conducted. The assessment concluded that there would be no significant impacts to any of the threatened species recorded or considered likely to occur.

The less disturbed vegetation communities within the site associated with the Myall River will be largely retained as part of the concept development proposal. The retention of these communities will provide an approximately 150m to 500m buffer between the development edge and the banks of the Myall River. The retention of these areas as buffers will provide for the protection of the Myall River from potential offsite and downstream impacts of adjacent development. This also includes the protection of areas of endangered ecological community Coastal Saltmarsh. Development within this vegetation community is limited to the extension of the existing drainage channel.

Proposed wildlife movement corridors include a north-south running corridor in the east of the site and an east-west running corridor at the northern boundary of the site. These areas will allow movement of fauna through the site to greater areas of habitat to the north.

Drainage corridors are also proposed as part of the development concept layout for water/drainage management. These areas will serve a function in

providing landscape linkage and providing habitat for semi-aquatic species within the site.

No species listed within the *Fisheries Management Act* (1994) are considered likely to occur in the Myall River. Also, wetlands and associated riverine and estuarine areas at the site will be protected and managed within the current proposal, with development limited to the extension of the existing drainage channel. It is considered that there will be no significant impacts to the wetland or aquatic environments at or adjacent to the site.

In addition, an Ecological Site Management Strategy (ESMS) (Conacher Environmental Group, 2008d) has been developed for the site (refer to Appendix 4 of the Ecological Site Assessment, *Volume 3* of the EA). The ESMS details strategies to control and minimise the ecological impacts of the proposed development to avoid significant impacts on threatened species, endangered ecological communities or endangered populations.

EPBC Act listed Matters of NES

The proposed development has incorporated large areas of native foreshore and swamp vegetation to be retained along the riverbank. These areas of retained native vegetation are expected to act as a natural buffer between the proposed development and the river. Therefore it is considered that the proposed action is not likely to have any detrimental impact on the Myall Lakes Wetlands of International Significance located upstream of the site.

There is suitable habitat at the site for the majority of the threatened species potentially occurring. However, the proposed development is not considered to have a significant impact on these species as it is expected that these species will use the wider locality for foraging and not the site exclusively.

4.12.7 Improve or Maintain Assessment

Improve or maintain assessments have been completed by Conacher Environmental Group (refer to Appendix 6 of the Ecological Site Assessment within *Volume 3*) for each of the threatened species identified as occurring on the site due to the presence of suitable habitat an know local occurrence of that species. The proposal will require the removal of vegetation and habitats for the construction of residential and commercial facilities and related infrastructure. Based on the concept plan, the development will require the removal or modification of approximately 126 ha of vegetation, however approximately 98 ha of vegetation will be retained, protected and restored as part of the site offset and ecological management strategies and open space corridors.

4.12.8 Ecological Site Management Strategy

A comprehensive Ecological Site Management Strategy (ESMS) (Conacher Environmental Group, 2008b) has been prepared which provides a range of management strategies to protect the long term environmental and ecological values of land within the proposed development site. The ESMS is provided in Appendix 4 of the Ecological Site Assessment in *Volume 3* of this EA.

The ESMS addresses 12 issues regarding ecological management at the site. These include:

- vegetation and bushland management;
- bush fire management;
- fauna and habitat management;
- provision and establishment of environmental corridors;
- provision of environmental buffers;
- erosion and sediment control;
- stormwater quality and management;
- cultural values and management;
- community education, vigilance and reporting;
- access, signage and fencing;
- prohibited use identification and management;
- feral pest species management; and
- monitoring and reporting regime.

The ESMS details management objectives and actions relevant to each of the above management issues and their applicability to various different areas of the site. These areas have been identified to ensure that only those actions relevant to certain areas are applied to the relevant area. These management areas have been separated as per the following:

- Management Area A – SEPP 14 Wetlands;
- Management Area B – Conservation Zoned Lands;
- Management Area C – Asset Protection Zones and Environmental Buffers;
- Management Area D – Wildlife Corridors;
- Management Area E – Drainage Corridors; and

- Management Area F – Developable Area.

Implementation of Management Strategy

It is proposed that the actions detailed within the ESMS will be implemented over a minimum ten year period following signoff of the plan by the Department of Planning. The long term timing, implementation and responsibility of the actions will ultimately depend upon the development of the various stages of the development and the title on the land.

A summary of the key management issues and actions including indicative timing and personnel/organisations responsible and are provided in the ESMS.

4.13 NOISE

A construction noise assessment in accordance with the NSW Industrial Noise Policy (INP, 2000) and the Environmental Noise Control Manual (ENCM) was undertaken by ERM (2008c). The assessment was undertaken to determine the extent of noise impacts associated with bulk earthworks, particularly in relation to the construction of the fresh stormwater quality management and detention ponds, which is expected to occur for a period of between 4 weeks and 26 weeks duration. Methodology employed and key findings of the assessment are summarised below. The full assessment report is presented in *Volume 3* of the EA.

Attended noise monitoring was conducted to ascertain dominant ambient noise sources and to quantify existing noise contributions. Construction noise impacts were assessed from two distances representing the near and far distances of construction positions of the stormwater quality / detention ponds from residences within Leeward Circuit, Tea Gardens. Results for both distances are represented as highest (at 40 metres) and lowest (at 280 metres). Additionally, plant was assessed at the existing ground surface at the same level as nearby residences and when at lower levels when in the base of the proposed ponds (up to 3.5 metres below current ground surface levels).

The results of the assessment of both scenarios are detailed in *Table 4.4*.

Table 4.4 Calculated Construction Noise Emissions

Receptor	Highest L10 Noise Impact dB(A)	Lowest L10 Noise Impact dB(A)	Construction Noise Criteria L10 dB(A)
Leeward Circuit, Tea Gardens.	76	45	48

Calculations of noise emissions associated with the construction of the stormwater quality / detention ponds identify that the construction noise criteria would be exceeded when plant items are stripping the surface soils, although would reduce significantly when they are at lower depths within the lower areas of the proposed ponds.

To minimise the potential acoustic impacts of construction activities on nearby residences, it is recommended that the following management and mitigation activities by implemented as part of the construction process:

- where practical, pushing topsoil or fill to form earth mounds between the construction site and residences during initial stripping. Barrier calculations identify that noise levels may be reduced by up to 15 dBA if a 3.5 metre earth mound is established between the sources and residences;

- where possible negotiated agreements between developers and residences should be established;

- where possible barriers should be placed nearest to plant and equipment to maximise barrier attenuation;

- maximise the offset distance between noisy plant items and nearby noise sensitive receivers;

- avoiding any coincidence of noisy plant working together in close proximity simultaneously near to sensitive receivers;

- minimising the occurrence of consecutive days works in the same locality;

- orienting noisy plant or equipment away from sensitive areas;

- carrying out loading and unloading away from noise sensitive areas, if loading near sensitive receivers acoustic enclosures or barriers of a suitable height should be constructed to minimise the noise impacts;

- where noise complaints arise, monitor construction noise levels to quantify potential impact at most sensitive residences; and

- the contractor must take reasonable steps to manage and control noise from all plant and equipment. Examples of appropriate noise management and control may include installation of acoustic silencers, low noise mufflers and alternatives to reversing alarms.

The noise impact assessment concluded that noise levels associated with construction are likely to be above construction noise criteria during initial stages, although when operations are at lower levels within the proposed ponds, noise level would reduce significantly. The implementation of the recommended management and mitigation strategies will significantly reduce impacts on nearby residences,

4.14 INFRASTRUCTURE

In preparing a strategy for servicing the development, investigations of the capacity of existing infrastructure to accommodate the proposal were completed by Tattersall Surveyors. The relevant service providers were consulted including Mid Coast Water, Country Energy and Telstra during the preparation of the service strategy. *Annex I* of *Volume 1* of the EA provides a copy of previous correspondence with Midcoast Water in relation to the provision of water and sewer services to the site. The Servicing Strategy for the Riverside development is provided in *Volume 3* of the EA.

There is no reticulated gas infrastructure in Tea Gardens.

Water

Reticulated water supplies are available to the existing development area, south of the site as detailed in the Servicing Strategy prepared by Tattersall Surveyors (refer to *Volume 3* of the EA). Existing water mains extend along Myall Street adjacent to the site, along Shoreline Drive and along the north side of Toonang Drive. These services will, in part, be utilised to service the proposed development.

Mid Coast Water has completed the upgrade and augmentation of potable water storages at the Viney Creek Road Reservoirs. In addition an 8.1ML reservoir has recently been commissioned and will provide sufficient capacity to meet the potable water needs of various potential developments in the area in the immediate future (Tattersall Surveyors, 2008). Mid Coast Water also has a secure coastal bore water supply that has a known water supply capacity which exceeds the requirements of the current potential developments at Riverside, Myall River Downs Estate, North Shearwater and Hawks Nest North (Tattersall Surveyors, 2008).

The proposed water supply service strategy is illustrated in the Tattersall Surveyors, 2008 report. It includes a reorganisation of major water supply services from existing dual supplies in Myall Street to a triple supply via North Shearwater. This third supply will also be potentially extended to Hawks Nest North via a connection at the northern part of the Riverside development. This design has the potential to reduce the trunk main sizing and future demands on potable water supply from the bore fields to the north of Tea Gardens (Tattersall Surveyors, 2008).

Investigations are being conducted by Tattersall Surveyors in consultation with Mid Coast Water, concerning the potential for the reticulation of treated effluent via a third pipe to all new residences within Riverside and areas to the north and west. BASIX compliance will be achieved through the installation of rainwater tanks. However, as detailed within *Section 4.3.1*, an assessment of the use and potential impacts of reclaimed water has been undertaken in light of the potential use of this water resource in future subject to a feasibility study being undertaken by MidCoast Water.

Sewer

Areas to the south of the site are already serviced by a reticulated gravity sewer system. Mid Coast Water has recently constructed a 'state of the art' vacuum sewer pumping station, which is sited adjacent to the Myall River Downs Estate, west of Myall Street (Tattersall Surveyors, 2008). It has been specifically sized to suit and be available to provide services for the Riverside development.

The vacuum sewer system includes ten vacuum lines, four of which are to be directed towards Riverside, the Tea Gardens Industrial Park (in the design phase) and North Shearwater, which is immediately north of the site. This system provides substantial environmental advantages over the gravity service including:

- less pumping stations, which means less potential for environmental discharge and less facilities requiring long term maintenance;
- significantly less long term groundwater infiltration as the system uses welded plastic PE pipes;
- significantly less access chamber infiltration from stormwater as the system uses less access chambers; and
- shallower pipe depths to avoid intercepting the groundwater table where practical.

The proposed development would have required the provision of at least eight conventional pumping or lifting stations. This service has been replaced by one coordinated system.

Electrical and Communication Services

Country Energy is proposing to relocate and upgrade its electrical supply network, including the relocation of their main supply substation further west along Viney Creek Road and is proposing a major upgrade of the facility as well as the incorporation of an adjoining maintenance service depot (Tattersall Surveyors, 2008).

Existing communication infrastructure, which incorporates fibre optic technology, is available along Myall Street and Toonang Drive. Telstra has already upgraded its services to Tea Gardens, which includes a 'fibre to the node' for The Hermitage and has offered via its Smart Communities program, the provision of services to Riverside.

The proposed electrical and communication services will extend from existing services. Crighton Properties has provided Country Energy with proposed subdivision layout so that they can commence designing for major new links from the existing overhead supplies.

The location of existing electrical and communication infrastructure and the proposed servicing strategy is illustrated in the Tattersall Surveyors, 2008 report.

Staging

Three stages have been identified for the provision of infrastructure. These three stages are to be implemented in co-operation with Service Supply Authorities, including MidCoast Water, to ensure that the connection and extension of infrastructure will not impact on the functioning or capacity of existing infrastructure. The stages are:

- stage one will include the servicing of Precincts 1, 2 and 3;
- stage two will occur in the north and north-western portion of Riverside within the area currently identified within the proposal as a concept stage; and
- stage three will involve the servicing of tourist facilities (for which concept approval is being sought).

The *Servicing Strategy* prepared by Tattersall Surveyors (2008) outlines in further detail the individual servicing strategy of water, sewerage, communications and electricity within the three stages. The Servicing Strategy has been annexed within *Volume 3*.

4.15 DENSITY

Riverside will have a net density of 13 dwellings per hectares. It is intended to create an authentic character that reflects the lifestyle choice desired by Riverside residents which is consistent with the Tea Gardens Hawks Nest Housing Strategy.

Within the existing settlement there is a gradation of density from urban adjoining the waterways and beaches of Hawks Nest and Tea Gardens to rural near Monkey Jacket. This has occurred in response to the amenity of Jimmy's Beach, Bennett's Beach and Myall River, which has been a driver for infill development (Duo, 2007). Development inland from these settlements has largely been driven by an older population, which has resulted in less dense development with this population preferring single storey dwellings over higher density dwelling types that have stairs or are expensive to construct if they include a lift.

The concept plan and project application incorporates a range of lot sizes throughout, to create a mixed development.

The Social and Economic Impact Assessment detailed in *Chapter 5* demonstrates the proposed developments compliance with the *revised draft Tea Gardens Housing Strategy*(PB, 2006).

4.16 AMENITY AND SCALE

The character and amenity of the Tea Gardens/Hawks Nest area was identified as an outcome from the Design Forum held in February 2006. The forum identified the architectural elements which made the residential developments within Tea Gardens a unique coastal village atmosphere which should be retained by future developments. This architectural style was:

- simple, straightforward volumes with front wings and verandahs added to make more complex shapes;
- deep, usable posted front verandahs with regular arrangement of columns and openings;
- simple eave lines accommodate gabled roof forms;
- single driveway to a garage set far back on the lot;
- buildings raised off ground on a plinth; and
- limited use of materials with lighter materials above heavier and joined horizontally.

(Roberts Day, 2007).

This architectural style was incorporated into the Architectural Design Guidelines within the Community Management Statement (*Annex F*) to guide future residential development in a manner which preserves and highlights the existing architectural styles.

The Coastal Design Guidelines of NSW (2003) outlines guidelines to stimulate debate on:

- *'how to protect and plan for the diversity of settlement types along the coast;*
- *how to avoid continuous strip-type urban development along the coast;*
- *where to encourage new settlements or large residential and rural residential subdivisions, particularly in relation to existing settlements;*
- *which places are able to grow larger sustainably;*
- *which types of settlement are to be protected from major developments;*
- *how to protect publicly and privately owned non-urban lands; and*
- *along the coast that have high scenic or ecological values' (*DoP, 2003*).*

The design forum allowed the guidelines to be addressed and influence the overall design of the Riverside site. Elements including residential density, the need for recreational facilities and improvements in civic spaces lead to the specific design of open spaces and civic streets which provide a sense of community within the Riverside site complementing the existing character of the Tea Gardens/Hawks Nest area.

The proposed open spaces and civic streets illustrate the logic and continuity of the open space system. Green corridors between neighbourhoods create a connected system for humans and animals, and to manage water run-off. This system connects to the nature reserve around the perimeter of the site (Roberts Day, 2007). The open space networks also provide both passive and active community facilities in the form of clubhouses, tennis courts and playing fields. The inclusion of various forms of community facilities allows for community interaction within the various precincts to create a village atmosphere.

The desired future character under the NSW Coastal Design Guidelines (2003) includes interconnectedness of residential areas, an ability to provide total water cycle management, a design that provides wildlife corridors and avoids areas of ecological significance and preserved and protects waterways as significant coastal locations. The desired future character is achieved within the Riverside development through the extension of the existing detention lake and the inclusion of three (3) separate freshwater detention ponds to provide total water cycle management and an attractive visual landscape within the open space networks which also function as wildlife corridors. The site adjoins SEPP14 Wetlands which are to be preserved as part of this development proposal.

The Urban Design Report prepared by Roberts Day dated October, 2007 (*Volume 3*) and provides additional detail regarding the urban design of the Riverside development.

4.17 URBAN DESIGN

A three day design forum was conducted by Roberts Day on behalf of Crighton Properties in February 2006 to undertake a workshop with local residents and officers of the Great Lakes Council to identify the urban design concepts for the Myall River Downs and Riverside sites.

The urban design concept proposes 'three compact, walkable mixed-use neighbourhoods' surrounded by a comprehensive open space system of parklands and water bodies' (Roberts Day, 2007). The plan allocates environmentally sensitive land into a permanent nature preserve. A network of carefully laid trails and boardwalks provides the entire community with the opportunity to engage meaningfully with these conservation zones (Roberts Day, 2007).

The steep topography to the north of the site, overland water flows and high water table has resulted in the creation of extensive green corridors. A variety of separate detention ponds/lakes will environmentally manage water run-off. Functioning as "greenbelts" for each village precinct are clearly defined and development cannot sprawl out into the countryside. Pedestrian and cycle trails weave throughout this system connecting each village precinct (Roberts Day, 2007).

Great Lakes Council's Housing Strategy identifies the need for higher residential densities in order to address the growing demand for residential development within the Tea Gardens/ Hawks Nest area. This resulted in the revision of the original golf course design to the current design being walkable precincts with associated community facilities connected via land bridges between the separate bodies of water.

The major urban design principles include walkable neighbourhoods, connected communities, a mix of building types and uses, design of quality open space, and the use of civic buildings as local point and destinations. These urban design principles have been achieved in the following ways:

- a reduction in the size of neighbourhood to smaller communities to allow walkability to community facilities and public transport nodes;

- design of road networks to provide alternative routes to destination which include connected pedestrian pathways and separation between vehicles and pedestrian movement to encourage walkability;

- provide a mix of uses within a community to provide for passive surveillance within a community to increase safety and security whist moving through the neighbourhood;

- by providing a full range of housing types and work places, age and economic classes are integrated and the bonds of an authentic community are formed;

- open space is provided in the form of specialised plazas, squares, greens, playgrounds, parks and greenways. Each type is defined by its size; the landscaping used, if any; and the way the space is surrounded; and

- civic buildings, such as community facilities, churches, community halls are located within open spaces or at the termination of important vistas. Such structures promote democratic initiatives and the balanced evolution of society is facilitated (Roberts Day, 2007).

Further detail regarding the urban design process and principles are detailed within the *Urban Design Report* prepared by Roberts Day, 2007 (*Volume 3*).

4.18 SOLAR ACCESS

The design of Riverside at Tea Gardens subdivision is based on an analysis of the constraints and opportunities of the site, particularly relating to its physical attributes, potential hazards and the appropriate range of housing stock to cater for diverse household types. The planning layout (street grid) of the Riverside site responds to many informers of urban design, including;

- ecological constraints;
- water movement patterns / slope of land;
- view sheds;
- transport and pedestrian movement patterns;
- access to open space;
- privacy;
- hierarchy of density;
- passive surveillance; and
- permeability.

Many of these concepts are explained in more detail within the Riverside Design Manual prepared by Roberts Day (2007). In addition to these design considerations, particular attention has been paid to passive thermal efficiency of the Riverside site, through the consideration of solar access and orientation. Design consideration has primarily occurred at three levels namely:

- street pattern and orientation;
- range of lots sizes; and
- house design criteria.

Each of these will be designed to work in unison with each other to ensure a balanced thermally efficient outcome.

4.18.1 Street Pattern, Orientation and Lot Size.

The design proposal for Riverside is, by urban design standards, a low density village with lots averaging around 600sqm in size at a nett density of 13 dwellings /hectare. By virtue of this density, more freedom is afforded in solar orientation to allow for adequate solar access to predominantly single and two storey residences (height levels are restricted under the Residential 2(f) zone). The low density nature of the proposed development is demonstrated in *Figure 4.1*.

The general layout of the road pattern seeks to minimise large areas of a continuous/ repetitious grid pattern in favour of a series of more compact pockets of development where split streets, open spaces and perimeter roads maximise the edges through which solar access, as well as outward looking to open space, can occur. The typical road pattern layout and connectivity to the open space network is demonstrated in *Figure 4.1.*

Generally the road pattern is aligned diagonally to true north. This allows for greater freedom of house design in a low density setting to capitalise on solar access to individual lots. Where density is increased (for example along the main road at the second roundabout approach) and shop / business top dwellings are encouraged, orientation is configured north / south and rear lane access is provided to assist solar orientation and maximisation of frontage to the active street (refer to *Figure 4.1*).

4.18.2 Range in Lot Sizes and House Planning

Within the established street network a large range of lot types (proportions) and sizes are proposed in order to cater for a number of household budgets, household sizes and the needs of each household's occupants. Each lot lends itself to a favoured orientation, which is shown within the project documentation sheets R.C. 43 – R.C. 48, (refer to Concept Plans and Project Application Plans within *Volume 2*) which illustrates suitable house forms to capitalise upon the preferred orientation for that lot – these are replicated within the Riverside layout. Additional information relating to lot sizes and orientation is provided in *Annex J.*

4.18.3 House Design Criteria

In addition to overall street layout, range of lot sizes and proportions available, design criteria for dwellings will be implemented by the Community Association by way of Architectural Standards which seek to maximise opportunities for solar access to each individual residence. These standards include:

- insetting of the structure at the first floor level by 3.0 metres from side boundaries to allow for solar access and minimise overshadowing; and
- breaking up of roof forms to allow for attenuation and further opportunity for sunlight ingress.

Figure 4.2 provides a concept for house design to maximise solar access.

Proposed low density nature of Riverside at Tea Gardens.

Road pattern layout and connectivity to open space network.

North / South street orientation with higher density lots.

Figure 4.1

Solar Access - Street Patterns, Orientation and Lot Sizes

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_river_aug_13		
Date:	21/08/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties Pty Ltd		
Scale:	Refer to Scale Bar		

N

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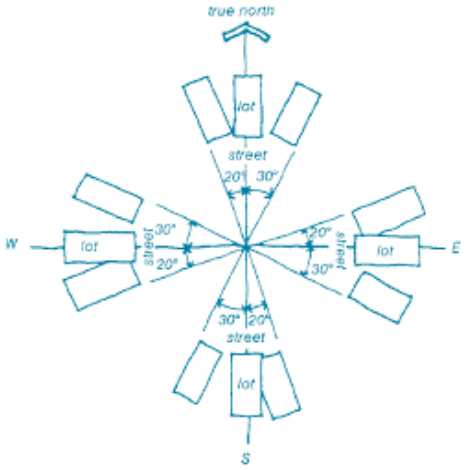
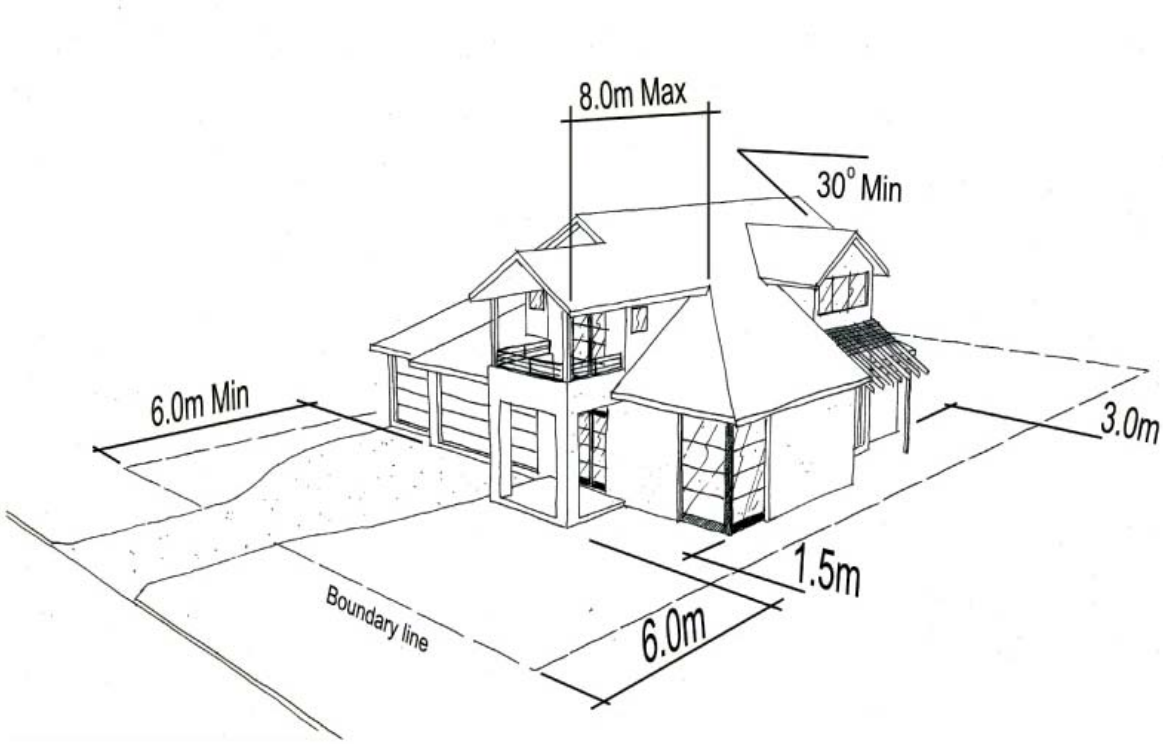
ERM



Orientation of Lots within Energy Efficient Subdivision (Source: AMCORD, 1995)



House Design Concept to Maximise Solar Access (Crighton, 2008)

Figure 4.2

Orientation of Lots and House Design Criteria

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_river_aug_14		
Date:	21/08/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Crighton Properties Pty Ltd		
Scale:	Refer to Scale Bar		

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Environmental Resources Management Australia Pty Ltd
53 Bonville Avenue, Thornton, NSW 2322
Telephone +61 2 4964 2150

ERM

4.19 SITE PERMEABILITY

The Myall River Downs and Riverside site is split down the middle by Myall Street which is the major entry to the township of Tea Gardens. In its current state it does not provide a memorable arrival experience. The proposed Master Plan for Riverside and Myall River Downs seeks to address this issue. The plan is structured on three main elements: Nature Preserve, Neighbourhoods and Corridors, (Roberts Day, 2007). The context of the Tea Gardens area requires an assessment of the access and servicing over both the Riverside and Myall River Downs site as both sites will need to demonstrate links between the employment, industrial and retail areas which will be development on both sites to service the area.

The Corridors are the linear open space systems which weave between the villages and precincts and interconnect the Nature Reserves. Throughout Riverside and Myall River Downs these corridors have been sculptured into beautiful linear parks with detention ponds and water bodies to effectively manage water. A comprehensive system of pedestrian, cycle paths and trails will weave throughout these three main elements (Roberts Day, 2007).

The entry to Tea Gardens via Myall Street is dysfunctional and dangerous for pedestrians. To provide a more appropriate access point to Tea Gardens it is proposed to change Myall Street into Myall Boulevard. The Master Plan will allow pedestrians to cross safely, and traffic to move more slowly than it does today. The proposal offers a traffic calming solution that is beautiful, distinctive and effective. At the same time it preserves the thoroughfare's traffic capacity (Roberts Day, 2007).

The reconfiguration proposes one-way parallel service roads to be built on both sides allowing local traffic to access Riverside and Myall River Downs and minimise interference with through traffic. A central median will also be added. Closely spaced canopy trees will line the median, service roads and pedestrian /cycle paths. The trees combined with distinctive butteries at the northern edge of the township, will herald arrival and further calm traffic. The reconfiguration will dramatically improve the pedestrian and cycle paths into the township, and provide a safe crossing environment (Roberts Day, 2007).

The design of the Riverside site has included transport networks and public transport corridors to provide a connection between the Myall River Downs site and the adjoining Tea Gardens, Shearwater Estate and Hawks Nest areas. The Urban Design Report prepared by Roberts Day (*Volume 3*) identifies the movement of traffic through the site and its connection with the existing area.

4.20 TRAFFIC AND ACCESS

4.20.1 Vehicle Movement and Intersection Capability

Vehicle access for the project application will be from Shoreline Drive via the existing intersection at Myall Street. In the concept plan access will also be provided from a new access point along Myall Street and two access points from Toonang Drive as part of the future development of Riverside.

A traffic impact assessment which investigated traffic flow and intersection capacity was completed by Mark Waugh Pty Ltd (2008) for the development of the concept plan and project application. The traffic assessment also considered the relationship of the project application to the concept plan and surrounding development.

Traffic Generation and Movement

Existing traffic flows at the intersection of Myall Street and Shoreline Drive are low. A traffic survey indicated that during the morning peak period the two way traffic flow along Myall Street (west of Shoreline Drive) was in the order of 362 vehicles, with vehicles predominantly going to the west (193 vehicles). The results from the afternoon survey show a peak flow of 421 vehicles with movement predominantly to the east (250 vehicles).

The traffic flows along Shoreline Drive are significantly less with 135 vehicle recorded during the morning survey and 256 vehicles recorded in the afternoon. This reflects the demands associated with the shopping centre. As a significant proportion of existing residents in the Tea Gardens – Hawks Nest area, are retired, school or work related trips are reduced.

Based on the *RTA Guide to Traffic Generating Developments* Myall Street has the capacity to accommodate 1,400 vehicles per hour in one direction. When comparing this capacity with the existing traffic flows it is evident that Myall Street has capacity to absorb additional traffic.

Using the *RTA Guide to Traffic Generating Development* rate of 0.85 trips per dwelling during peak and 9 trips per dwelling per day the traffic generated by the project application is estimated to be 324 vehicle movements per hour and 3429 vehicle movements per day. This is considered an upper limit, as there are a number of factors that contribute to lower traffic movement, as listed below:

- a significant proportion of current residents are retired and therefore do not have school or work related trips. Assuming a similar demographic for the project application and concept plan, the traffic flows would be lower;
- a significant proportion of traffic will be localised. The *RTA Guide to Traffic Generating Development* indicates that typically some 25 percent of traffic is contained within the area of a development. Therefore there is reduced use of the external road network;

- the layout of the site encourages pedestrian and cycle movement for short trips, rather than vehicle use; and

- the home business opportunities will allow for a portion of future residents to work from home, reducing the need for daily commuting to major centres.

In light of the above factors, the *RTA Guide to Traffic Generating Development* rates has been reduced by around 35 percent giving an external trip generation rate of 0.55 trips per dwelling during peak periods. The daily rate has also been reduced. Based on these rates the project application would generate approximately 209 vehicles per hour two-way. The concept plan (that is full development) would generate 575 vehicle movements per hour.

Intersection Operations

The Myall Street and Shoreline Drive intersection provides a give way control with a central right turn lane, so that west bound traffic is not impeded by traffic turning right, and provides a deceleration lane for traffic turning left from Myall Street.

An assessment of the operation of this intersection using the Sidra computer program indicated that, assuming the 2007 intersection layout and traffic flows plus traffic from the project application, the existing intersection control is adequate to cater for the flows associated with the project application. The Level of Service ('LoS') of the existing intersection at Myall Street and Shoreline Drive will be A, A and B for through traffic and right turn into and out of Shoreline Drive, respectively. Assuming 2017 conditions, the LoS will be A, A and C for through traffic and right turn into and out of Shoreline Drive, respectively. Therefore the existing priority controlled intersection will continue to provide a high level of control for all road users over a ten year design period for the project application. The approach capacity on Myall Street is also satisfactory as a two lane configuration, and does not required upgrading to cater for the project application development.

With the development of Myall River Downs on the west side of Myall Street, the existing intersection will need to be upgraded to a roundabout control to allow for a four way intersection. It is assumed that the Myall River Downs development would accommodate some 1500 lots. A Sidra analysis of a proposed four way roundabout indicated that it would be adequate to accommodate the Riverside and Myall River Downs developments.

This intersection is in a safe and appropriate location. With the future upgrade of this intersection to a roundabout control, when Myall River Downs is developed opposite the site, the safety will be further increased.

A second intersection will be constructed to the north of the existing intersection, as part of the concept plan. It will be a priority controlled intersection similar to the intersection of Shoreline Drive and Myall Street.

An assessment of the operation of this new intersection using the Sidra computer program indicated that, assuming the 2012 traffic flows plus traffic from the full development, it will provide an A and B Level of Service ('LoS') for right turn into and out of the access road, respectively. The additional connections to the north via Toonang Drive will also be available and may result in a better LoS for the existing and proposed intersections to the development from Myall Street.

A further assessment of this intersection was completed to investigate the impact of the additional traffic from Myall River Downs on its operation. Through analysis it was determined that 500 lots could be developed in Myall River Downs without providing unacceptable delays at the intersection. Beyond that the second access would need to be upgraded to avoid unacceptable delays for traffic turning into and out of Riverside.

Another consideration impacting on the second roundabout is the major proposed industrial development, on the west side of Myall Street. This will create a four way roundabout. An assessment of the operation of a four way roundabout at the second intersection using the Sidra computer program indicates that it will be adequate to cater with the predicted traffic flows at full development.

The timing of the roundabout control at the second intersection is determined by the rate of development, in particular the industrial development.

The intersection is located in a safe and appropriate location and provides good visibility.

Traffic Management Measures

Based on the above analysis the following management measures are to be included in the statement of commitments:

- the second access to Myall Street (as a priority controlled junction) will be provided prior to the development of 500 lots within the concept plan;
- access to Toonang Dive will be provided by the release of the 700th lot in the concept plan; and
- the accesses onto Myall Street must be upgraded at / before the requirement for a four way intersection, which is triggered by the development of Myall River Downs or the industrial land west of Myall Street.

4.20.2 Road Dedication

All roads within the Riverside at Tea Gardens development will be dedicated to Great Lakes Council. Correspondence received from Council in relation to the road network of Riverside is provided in *Annex I* of *Volume 1* of the EA.

4.20.3 Road Adjoining Pony Club Site

As detailed in Drawing R.C -13 (refer to *Volume 2*), a road is proposed to be constructed partially within the existing Pony Club site. The road will be located partially on the eastern and northern portion of the site. The Pony Club site is currently owned by Great Lakes Council and Council's consent to the proposal is provided in *Annex I* of *Volume 1* of the EA.

4.20.4 Urban Design

The Riverside development incorporates a number of transport objectives that relate to pedestrian, vehicle and cycle movement, public transport and parking. The key objectives are outlined below.

Pedestrian Movement

- to promote 'walkability' through the site by: providing direct links within the site and to neighbouring attractions; giving pedestrians priority over vehicles within the site; creating pedestrian links through open spaces; and providing a high standard of pedestrian accessibility / mobility through good quality signposting, lighting and use of materials.

Vehicle Access and Movement

- to promote pedestrian priority for the site, vehicle crossing points of footpaths areas;
- to enhance pedestrian safety, traffic calming methods will be implemented within the local road system; and
- to promote high pedestrian activity, low vehicle usage and high residential amenity, roads widths will be reduced to a level that still allows for essential vehicle access and movement.

Public Transport

- to provide high quality bus facilities at Myall Street and Shoreline Drive; and
- to promote access to public transport from the site by using local shops as a focal point for access to bus services.

Cycling

- to promote cycling and protect the pedestrian environment by providing well located cycle routes.

Parking

- to provide sufficient parking to meet the needs of future residents and other users of the site.

4.20.5 Public Transport

Riverside is currently served by buses along Myall Street. The proposed Riverside development will increase the population of Tea Gardens contributing to greater potential patronage levels to sustain a viable bus service.

There are two bus routes that serve Tea Gardens. Both routes are operated by Busways and provide a service to Raymond Terrace and Newcastle three times daily during weekdays and daily on the weekend (Duo, 2008). There are also buses to Hawks Nest, Bulahdelah, Forster Tuncurry and Taree that operate at different times during the week and weekends. School bus routes link Tea Gardens, indirectly or directly, with 23 schools in the area.

The concept plan incorporates a street hierarchy that aims to provide potential bus routes within 400 metres of all dwellings.

Pedestrian and Cycle Access

The topography of Tea Gardens is relatively flat, which is conducive to walking and cycling. In 2004 Great Lakes Council received a grant of $70,000 from the state government for the establishment of a cycle path linking Tea Gardens and Hawks Nest (Duo, 2008).

Walkability and cycle access is integrated in the development of the site, with a shared cycle / pedestrian network through the residential subdivision and integrated with the existing commercial centre and the wider area. It will link with the new, state government funded cycle path.

Crighton Properties is committed to providing numerous sections of cycleway and pedestrian access ways as stipulated in the draft planning agreement. These cycleway and pedestrian access ways will be provided in accordance with the timing stipulated in the planning agreement.

4.21 *ENVIRONMENTAL RISK ASSESSMENT*

The Director General's Requirements (DGRs) state that the proposal is to provide a risk assessment for effluent disposal including the potential impacts and relevant mitigation measures in the event that a failure of the effluent disposal system occurs through flooding or other events.

Crighton Properties have been liaising with Midcoast Water for an extended period to provide reclaimed water supply to the site. Whilst both Crighton Properties and Midcoast Water are supportive of the use of reclaimed water throughout the Riverside site, Midcoast Water is not in a position to embark upon required upgrades to treatment facilities (to allow for the delivery of this supply) until such time as a level of security of future use of the resource is provided (through the approval of residential development) and a more detailed analysis is completed (refer to *Annex I* of the EA for correspondence from Midcoast Water).

Water supply and drainage modelling undertaken for the Riverside at Tea Gardens Environmental Assessment has been carried out to accord with the use of rainwater tanks to achieve BASIX compliance. However, information as to the likely future use and management of reclaimed water via a third pipe reticulation system is provided below.

4.21.1 *Reuse of Wastewater*

Coffey Geotechnics Groundwater Assessment Report (2007a) has identified the reuse of effluent as wastewater for irrigation purposes. The NSW Department of Environment and Climate Change (DECC) formerly the Department of Environment and Conservation (DEC) released *Environmental Guidelines: Use of Effluent by Irrigation* in 2004 which state that 'when using reclaimed water to irrigate open spaces, the quality of the underlying groundwater must not be downgraded to the extent that the resource is not able to support its most sensitive beneficial use' (NSW DEC, 2004). Where supporting technical advice has not been obtained, effluent should not be applied to land where the depth to groundwater table is considered to be less than 10 metres or where the irrigation area is located less than 1000 metres from a town water supply bore. Water quality objectives for the groundwater (i.e. water quality needed to protect beneficial uses of groundwater) should also be considered (NSW DEC, 2004).

The Groundwater Assessment has identified that groundwater was shallower than 10m across the site during the previous and current monitoring undertaken. *Table 4.5* shows an indicative concentration of the reclaimed water that may be used for irrigation purposes compared to the ANZECC Guidelines for irrigation and the protection of marine ecosystems.

Table 4.5 Water Quality of Reclaimed Water

Parameter	Indicative Concentration (mg/L)	ANZECC Guidelines for Irrigation (long term use) (mg/L)	ANZECC Guidelines for marine ecosystems (90% protection) (mg/L)
pH	6.8	4.5-9.0	-
Total Phosphorus	2.2	0.05*	-
Nitrogen (Ammonia)	1	-	1,200
Nitrogen (Nitrate)	5	-	0.7^
Total Nitrogen	6.4	5	-

* for bio-clogging of irrigation equipment only
^ low reliability trigger value
- no guidelines available

(Coffey , 2007a)

The groundwater results suggest that the reclaimed water may be suitable for irrigation of open spaces and gardens within the development area subject to a small reduction in total nitrogen concentrations. This reduction may be achieved through a combination of treatment and dilution of reclaimed water with water of higher quality.

The concentration of pathogens is also an important effluent quality consideration in terms of public health, which affects the way effluent should be reused and managed on-site. Treatment would need to occur as required to meet relevant health standards (Coffey, 2007a).

4.21.2 Groundwater Modelling

The Riverside development lies in an area with a shallow groundwater table that has the potential to be impacted by the proposed changes to the development. A groundwater model was established using MODFLOW, a finite difference groundwater simulation program, during the 2004 monitoring period, based on the level of understanding of the hydrogeological conditions in the vicinity of the site at that time (Coffey, 2007a).

Groundwater quality results are 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 below 0.1 m within the wetland area. Changes to this magnitude would be within the existing groundwater level variability and are therefore considered unlikely to adversely affect adjacent ecosystems (Coffey, 2007a).

The detailed modelling and technical study is provided within the Groundwater Assessment prepared by Coffey Geotechnics, (Coffey 2007a) which is annexed within *Volume 3.*

4.21.3 Reuse of Reclaimed Water

A laboratory water sample was developed with similar concentrations of nitrate, phosphorus and pH to the reclaimed water data supplied by Mid Coast Water. This water was used as a leaching agent for three soil samples collected from the site.

The concentration of nitrate in the leachate water was similar or greater than the concentration of nitrate in the lab-produced reclaimed water. This indicates that the potential for nitrate adsorption on the soil is low and the travel time of nitrate through the soil is likely to be similar to the rate of water through the soil (Coffey, 2007a).

The concentration of phosphorus in the leachate water was consistently significantly below the concentration of phosphorus in the lab-produced reclaimed water. These results indicate the soil at the site has the capacity to adsorb the phosphorus present in the reclaimed water and that the travel time of phosphorus through the soil is very slow.

These initial results show that with respect to phosphorus, the reclaimed water may be used for irrigation purposes. However, Coffey recommend further testing when a sample of reclaimed water from Mid-Coast Water is available (Coffey, 2007a).

4.21.4 Recommendations

The groundwater results from the current monitoring suggest that the reclaimed water may be suitable for irrigation of open spaces and gardens within the development area subject to a small reduction in total nitrogen concentrations. This reduction may be achieved through a combination of treatment and dilution of the reclaimed water with water of higher quality.

Based on the results three re-use options are presented as possible scenarios for the use of re-used water for the purposes of irrigation:

1. treatment of the reclaimed water to meet health standards including pathogens. The reclaimed water may be used for irrigation if 10% of the reclaimed water is mixed with 90% of fresh water;

2. treatment of the reclaimed water to limit NO3 to an average concentration of 0.7mg/L. If this level of treatment is obtained on an average basis, 100% of the reclaimed water may be used for irrigation purposes, assuming partial uptake of nutrients by vegetation; and

3. treatment of the reclaimed water to limit NO3 to an average concentration of 1.4mg/L. If this level of treatment is obtained on an average basis, a mixture of 50% of reclaimed water and 50% of fresh water may be used for irrigation (Coffey, 2007a).

With respect to the use of reclaimed water for irrigation purposes, it is considered that irrigation of parks and open spaces within the development is unlikely to adversely impact groundwater or the water in the lake if one of the above treatment options is employed. Appropriate monitoring of irrigated areas should however be employed to ensure key indicators remain within relevant guidelines.

Monitoring of the groundwater system is recommended to confirm the findings of this report following development and initiation of any proposed water re-use program. Coffey recommend that a monitoring plan be developed to check performance of the groundwater system. This would include:

- monitoring of irrigation water and groundwater quality;
- irrigation water application rates and timing; and
- soil testing (Coffey, 2007a).

4.22 CUMULATIVE IMPACTS

4.22.1 Traffic

There are two key potential developments in proximity to Riverside, namely:

- Myall River Downs which incorporates approximately 1500 lots; and
- industrial development on the west side of Myall Street.

It must be noted that there is no approval for these developments at this stage, however they have been considered to ensure a robust assessment.

As outlined in *Section 4.20*, an assessment of Myall Street and Shoreline Drive intersection was completed to investigate the impact of the additional traffic from Myall River Downs on its operation. Through analysis it was determined that 500 lots could be developed in Myall River Downs without providing unacceptable delays at the intersection. Beyond that the second access would need to be upgraded to ensure acceptable delays for traffic turning into and out of Riverside.

As also outlined in *Section 4.20*, the industrial development on the west side of Myall Street on the second access along Myall Street will create a four way roundabout. An assessment of the operation of a four way roundabout at the

second intersection using the Sidra computer program indicates that it will be adequate to cater with the predicted traffic flows at full development.

The timing of the roundabout control at the second intersection is determined by the rate of development, in particular the industrial development.

An assessment of the capacity of Myall Street to accommodate traffic from Riverside, the industrial development and Myall River Downs demonstrates that the existing two lane configuration of Myall Street is adequate.

4.22.2 Infrastructure Development

As outlined in *Section 4.14*, investigations of the capacity of existing infrastructure to accommodate the proposal were completed as part of the preparation of a strategy for servicing the development.

In summary the investigations indicated that the proposal will not overburden existing and planned infrastructure servicing the area as set out below.

- reticulated water supplies are available to the existing development area and Mid Coast Water has completed the upgrade and augmentation of potable water storages at the Viney Creek Road Reservoirs and an additional 8.1ML reservoir has recently been commissioned and will provide sufficient capacity to meet the potable water needs of various potential developments in the area in the immediate future (Tattersall Surveyors, 2008). Mid Coast Water also has a secure coastal bore water supply that has a known water supply capacity which exceeds the requirements of the current potential developments at Riverside, Myall River Downs Estate, North Shearwater and Hawks Nest North;

- a reticulated gravity sewer system services the area to the south of the site and Mid Coast Water has recently constructed a vacuum sewer pumping station, adjacent to the Myall River Downs Estate, which has been specifically sized to suit and be available to provide services for the Riverside development. The vacuum sewer system includes ten vacuum lines, four of which are to be directed towards Riverside, the Tea Gardens Industrial Park (in the design phase) and North Shearwater;

- Country Energy is proposing a major upgrade of the main supply substation facility that services the area, as well as incorporating of an adjoining maintenance service depot (Tattersall Surveyors, 2008). Country Energy has been provided with the proposal so that they can commence designing for major new links from the existing overhead supplies; and

- Telstra has already upgraded its services to Tea Gardens, which includes a 'fibre to the node' for The Hermitage and has offered via its Smart Communities program, the provision of services to Riverside.

4.22.3 Social Infrastructure Development

Chapter 5 examines the capacity of services and facilities in the Tea Gardens area to accommodate the anticipated growth in population generated by the development. It investigated housing, health, recreation and education facilities.

In relation to housing it was evident that there is sufficient aged care and retirement living services to accommodate the anticipated population growth in Tea Gardens. In addition, it was identified that there was affordable housing already available in the area and the development would further contribute to this positive situation.

The John Hunter Hospital and Mater Hospital provide acute medical facilities and specialist services in Newcastle and have over 800 beds. In terms of health facilities, the Department of Health and Ageing advised that the national average for hospital beds is 2.43 persons per 1000 population. Based on this average, the future population at Riverside will generate the requirement for an additional five hospital beds, assuming that the population does not already reside in the Hunter New England Health Service catchment (Duo, 2008). However, this needs to be seen in the context of the Lower Hunter Regional Strategy (DoP, 2006), which assumes population growth of 160,000 people over the next 25 years, and the Draft Mid North Coast Regional Strategy (DoP, 2007) which sees growth of 90,000 people over the same time period. Hunter New England Health will plan their service provision to accommodate this growth of which Riverside is a part. The impact of the Riverside at Tea Gardens development on hospital beds is considered negligible as the full development of Riverside is anticipated to occur over a 15 year period and additional hospital beds required to support the future Riverside population will be incorporated into service provision for the anticipated regional growth of the Lower Hunter and Mid North Coast.

Riverside can be served by the Myall Quays Medical Centre at Riverside which provides a range of services. In relation to general practitioners, the optimum ratio is generally one doctor per 1500 persons. The Myall Quays Medical Centre includes three general practitioners and room for a fourth. This can serve future residents at Riverside and Myall River Downs at Tea Gardens. The town's current population together with the anticipated increase in population generated by Riverside is estimated to be 5,286 persons, which would generate the requirement for about 4 general practitioners (Duo, 2008). Additional services would be required when the Myall River Downs, North Hawks Nest and North Shearwater developments are completed, as these three developments are anticipated to generate an additional population of 3,800, which generates the requirement for another 2 ½ doctors.

There are 23 schools that can be accessed by bus from Tea Gardens, of which there are four high schools and five primary schools that have direct bus routes from Tea Gardens. Based on ratios provided by the Department of Education and Training (DET) for the provision of education facilities the

demand generated by future residents of Riverside can be accommodated in the existing education facilities. This is further discussed in Section *5.4.4*.

In terms of community (library, pre-school and community halls) Council acknowledged that to accommodate an expected population growth in the area over the next 25 years, existing public services and facilities would need to be extended and other facilities may need to be provided (Great Lakes Council, 2003c). Council estimated that by 2011, all community facilities would likely be used to capacity (Great Lakes Council, 2003d).

The implications and proposed contribution to recreation facilities is outline in section 2.7 of this report. In short, Crighton Properties plan to provide 6.4 hectares of land for structured open space at the proposed Myall River Downs Sporting Complex site as it would consolidate recreational facilities and serve the needs of a significant proportion of the future population. It is however, considered inappropriate for North Shearwater, Tea Gardens Infill and Hawks Nest to provide further allocation of courts and playing fields on those sites as this would result in an over supply of recreation facilities that would be more costly and inefficient to use and maintain.

5 SOCIAL AND ECONOMIC IMPACT ASSESSMENT

This chapter provides a discussion of the social and economic issues arising from the proposed development. The proposal identifies the future Riverside estate demographics which will contribute to the existing community profile of the Tea Gardens/ Hawks Nest area. The requirement for community facilities, education and health services are outlined as well as the creation of new employment opportunities within the Riverside estate.

5.1 METHODOLOGY

A Social Impact Assessment (SIA) of the Riverside at Tea Gardens development was completed by Duo Consulting (Duo, 2008). It examined the capacity of services and facilities in the vicinity of Tea Gardens to accommodate the growth in population anticipated as a result of the proposed development. The assessment examined the current profile of the population of Tea Gardens, existing access to key services, the likely impact of Riverside on those services and recommendations for enhancement of services where required to service the future Riverside population.

The SIA was based on statistical profiling and community consultation. The statistical data was mostly derived from the Australian Bureau of Statistics (ABS) 2006 Census, with supplementary data from local government and private developers. Information obtained from the Design Forum conducted in February 2006 and other community consultation programs were incorporated into the assessment to provide perspective and value to the analysis.

An assessment of housing issues relating to Riverside was also investigated by Duo (2007). It examined issues relating to housing choice, density and demand and supply in Tea Gardens to inform lot size and housing options for the Riverside development.

The following sections set out the key findings of the SIA and housing issues report.

5.2 EXISTING COMMUNITY PROFILE

5.2.1 Tea Gardens

Population and Population Growth

At the time of the 2006 Census the total population of Tea Gardens was 2,094 people. Between 1991 and the 2001 Census the population of Tea Gardens doubled from 684 people to 1,372, an average growth of 7.5 percent annually.

Between 2001 and 2006 the population of Tea Gardens grew from 1,372 to 2,094, an average annual growth rate of around eight percent, which was approximately seven times the NSW average growth rate. Between 1991 and 2006, the Tea Gardens population grew by 206 percent.

Data relating to the last place of residence in the 2001 Census indicated that Tea Gardens experienced rapid population growth preceding the 2001 Census. More than 10 percent of the population lived at a different address one year preceding the census and 30 percent lived at a different address five years preceding the census. The data does not suggest a transient population, but rather demonstrates a growing community. This suggests that there are many newcomers and measures to assist them to integrate into the community will have a high value (Duo, 2008).

Numerous population projections for the future growth of the Tea Garden – Hawks Nest area have resulted in various projections. Although the projections vary they all show the population of the Tea Gardens - Hawks Nest area more than doubling over the next 25 years.

Age Distribution

The population of Tea Gardens is significantly older than the NSW or Great Lakes average.

At the 2006 Census, 55 percent of the population of Tea Gardens was aged over 55 years, which is more than double the NSW average of 25 percent. This trend appears to have continued since the Census with recent house sales data from Crighton Properties indicating that only eight percent of the purchasers since 2001 were under 40 years, whilst 43 percent were over 55 years. This is a strong indication that Tea Gardens continues to attract retirees (Duo, 2008).

At the time of the 2006 Census Tea Gardens had fewer people in the over 70 years age bracket than the Great Lakes average however it was still significantly more than the NSW average. The difference in average to the Great Lakes can be explained by a lack of acute age care facilities within Tea Gardens and the rapid expansion of the community (Duo, 2008).

The 2006 Census data indicates that there was a low number people in Tea Gardens aged between 20 and 30 years, and this was to be expected given the nature of the community, its isolation from tertiary education opportunities, the limited diversity of employment opportunities and the limited housing opportunities.

Recent upgrades to traffic infrastructure are improving access to employment opportunities and this may contribute to offsetting the ageing trend. According to the principal of the Tea Gardens Public School, enrolments in recent years have increased, which suggests that infrastructure changes may already be having some effect (Duo, 2008).

Household Type and Size

The population of Tea Gardens is likely to be or have been married and is more likely than the NSW average to have been widowed or divorced (Duo, 2008). Household sizes are predominantly one and two person households.

Tea Gardens has more than twice as many couple family households with no children (274) than couple family households with children (111). The number of lone person households (201) is also greater than the number of couple family households with children (Duo, 2008).

This profile can be expected, given the age profile of the community, which is largely characterised by people over 55 years.

Employment and Education

At the time of the 2006 Census labour force participation in Tea Gardens was 35 percent of the population which is lower than the NSW average of 58 percent. The low participation rate can be attributed to the age profile of the population. (Duo, 2008).

The 2006 Census data indicates that in the 2006 Census, 6.4 percent of the population attended primary school, four percent secondary school and two percent attended a tertiary institution or technical college. This data relates directly to the age profile of the population (Duo, 2008).

Ethnic Diversity, Religion and Language

The population Tea Gardens is dominated by people with European and Australian heritage. There is limited ethnic diversity. At the time of the 2006 Census only 286 people (13 percent) in Tea Gardens were not born in Australia and there were only 47 Indigenous persons, representing 2.2 percent of the population. The population of Tea Gardens has a slightly higher than NSW average proportion of people of indigenous and Torres Straight Islander background (Duo, 2008).

More than 90 percent of the Tea Gardens population is either non religious or Christian (Duo, 2008). More than 90 percent of the Tea Gardens population also speaks English, which is reflective of the lack of ethnic diversity of the population.

5.2.2 Tea Gardens – Hawks Nest District

The total population of Tea Gardens / Hawks Nest at the 2006 Census was 3,155. The population of Hawks Nest experienced a recent decline of nine percent between 2001 and 2006 (from 1163 in 2001 to 1061 in 2006). In the context of the population growth of eight percent in Tea Gardens during the

same period, it is evident that population growth in the area is predominantly in Tea Gardens (Duo, 2008).

Assuming that the supply of housing is a key determinant of population growth in Tea Gardens, the estimated future population of Tea Gardens / Hawks Nest is 12,558 (Duo, 2008). This is based on the anticipated future dwelling supply of four major greenfield developments identified in the Hawks Nest Tea Gardens Housing Strategy, as well as growth from infill opportunities and the Shearwater development (refer to *Table 5. 1*).

Table 5.1 Projected Population of Tea Gardens and Hawks Nest Based on Future Dwelling Supply

Site	Dwellings	Estimated Population
2006 Population		3,155 (actual)
Riverside	980	2,077
Myall River Downs	1,500	3,300
Hermitage	281	506
North Hawks Nest	750	1,650**
North Shearwater	350	770
Estimated Other*	500	1,100
Total	4,361	12,558

* Other dwellings based on combined infill dwellings based on the Hawks Nest Tea Gardens Housing Strategy.

** Assumes a considerable higher permanent occupancy rate than is currently the case in Hawks Nest as a highest case scenario.

Source Duo, 2008.

5.3 FUTURE ESTATE RESIDENTS

As indicated in *Table 5.1*, Riverside at Tea Gardens was expected to provide approximately 980 dwellings, adding around 2,077 people to the population of Tea Gardens. This is a generous projection as it assumes: occupancy rates of 1.3 persons for medium density houses and 2.2 for standard residences and duplexes; and that all houses will be occupied full time.

5.4 SOCIO – ECONOMIC IMPACTS

5.4.1 Demographic Change

Riverside will provide a mix of dwelling types which is anticipated to accommodate some 2,077 people. The anticipated age distribution of these residents, is set out in the Duo 2008 report which indicates that the greatest changes is likely to occur for the 25 to 54 years old and 65+ years age groups.

5.4.2 Housing

Housing Type

The 2006 Census data indicates that housing in Tea Gardens is dominated by separate houses (92 percent). Semi detached, row or terrace houses, townhouses comprised only five percent of the total housing stock and apartments and units comprised only two percent (Duo, 2008).

Since 2001 there has been a housing boom, which has seen an increase in townhouse and unit development. Detached dwelling developments have also continued to grow. Approval data provided by Great Lakes Council in the Tea Gardens – Hawks Nest Housing Strategy indicates that from 2000 to 2004, 315 dwelling approvals were granted, of which 65 (or 20 percent) were for units, duplexes or townhouses in Tea Gardens (PB, 2006).

The existing development at Riverside has commenced with 261 lots either on the market or sold with a substantial number of dwellings having been constructed. In total, 357 residential lots have been approved with 25 lots with Council for approval (Duo, 2007).

Retirement Living and Aged Care

Tea Gardens currently has 190 self care units and approval for a 80 bed hostel at Tea Gardens Grange (although only 30 beds currently have Government funding). There is a further 281 self care unit approved for the Hermitage site on the west side of Myall Street, adjacent to Myall River Downs. Another ten low care retirement units are located at Myall Lodge Aged Care facility in Hawks Nest with plans for an additional 20 units (Duo, 2008).

Commonwealth benchmarks suggest the need for one aged care bed for each ten residents aged over 70 years. At the time of the 2006 Census, Tea Gardens had 429 residents aged over 70 years, generating a requirement of 43 beds. Much of this demand will be provided for by the 30 beds available or to be constructed ay Myall Lodge Aged Care facility. Riverside is estimated to result in a demand of approximately 30 additional aged care places once fully developed. These beds can be accommodated at Tea Gardens Grange (Duo, 2008). A licence for a future 30 beds at Tea Gardens Grange has been granted.

Myall River Downs will subsequently require a further 50 beds when fully developed. These can be provided by the Tea Gardens Grange Facility. Ultimately, it is estimated that Tea Gardens and Hawks Nest will grow to 12,558 residents with (assuming 2006 census age distributions) 8% of population aged over 70 or 1005 people. This will mean demand for 101 aged care beds, 80 of which will be provided with the funding of the additional beds at the Tea Gardens Grange facility and a further 30 beds will be available at Myall Lodge. These will be enough to service growth anticipated in the Tea Gardens Hawks Nest area.

There is sufficient aged care and retirement living services to accommodate the anticipated population growth in Tea Gardens.

In addition, the Riverside development includes a number of elements that suit an older population, outside of the purpose built aged care and retirement living developments. These include:

- small and duplex lots providing for future housing with smaller yards, and therefore less maintenance;
- community infrastructure including precinct based facilities;
- flat topography, facilitating easy non vehicular access through the site;
- proximity to commercial facilities, including a medical centre;
- a design layout that promotes passive surveillance of the street; and
- emphasis on home business allowing for economic activity and partial retirement.

Home Ownership

Three bedroom houses in Tea Gardens are available from around $300,000 with some smaller dwellings available for less.

Many of the people moving to the area are retirees. A standard assessment of affordability based on comparing income and mortgage payments is not relevant for retirees, as they tend to have low incomes but have equity in their houses. Retirees seeking to move to Tea Gardens will do so if they can afford it (Duo, 2007).

For younger people / families the standard assessment is applicable. The Westpac mortgage calculator shows that with an annual income of $55,000, which is reflective of professions such as teachers and police people, a single income household with no children can borrow $300,000. This is enough to enter the housing market in Tea Gardens. A similar calculation for dual income families also indicated that they can afford to enter the market at Tea Gardens. The exception is single income families, which would have difficulty entering the housing market in any coastal area (Duo, 2007).

Rental Market

The rental market in Tea Gardens / Hawks Nest is very competitive and relatively cheap by almost any other comparison, with an average rent of $195 per week. Crighton Properties are exploring house design solutions to provide for affordable rental housing.

Housing Stress and the Potential to Enhance Affordability

Housing stress is typically defined in terms of more than 30 percent of gross income being spent on housing. For a $300,000 dwelling with a 20 percent deposit at an interest rate of 7.5 percent, a household income of $67,000 would be required to not be considered to be experiencing housing stress (Duo, 2007).

Average rental properties in Tea Gardens are accessible without stress to any household with combined incomes of $34,000 or more.

Based on the above, housing is available in Tea Gardens to a range of income groups without resulting in household stress.

At Riverside, six approaches will be implemented to encourage the provision of affordable housing, namely:

- the inclusion of at least ten percent of lots less than 450 square metres, to provide housing options;
- encouraging shared use dwellings incorporating home office facilities to create affordable lifestyle opportunities;
- to allow for alternative dwelling types, such as 'dual key' dwellings where areas of a dwelling can be rented out as self contained units;
- allowing for an adequate supply of housing in the concept plan and project application;
- through a subdivision design that maximises opportunities for an affordable lifestyle by encouraging the use of non motorised transport modes, accessibility of services and facilities and energy and water efficiency; and
- encouraging a rental market.

5.4.3 Health

The medical centre at Riverside provides a range of services, including three general practitioners, two dentists, pathology, radiology, pharmacy services and a number of visiting specialists. There are also two more doctors in Tea Gardens and Hawks Nest. Tea Gardens also has its own ambulance station.

The Hawks Nest – Tea Gardens Community Health Centre in Hawks Nest also offers a range of community based health services, and more acute medical facilities are provided in Newcastle.

The Department of Health and Ageing advised that the national average for hospital beds is 2.43 persons per 1000 population. Based on this average, the future population at Riverside will generate the requirement for an additional

five hospital beds, assuming that the population does not already reside in the Hunter New England Health Service catchment (Duo, 2008). However, this needs to be seen in the context of the Lower Hunter Regional Strategy (DoP, 2006), which assumes population growth of 160,000 people over the next 25 years, and the Draft Mid North Coast Regional Strategy (DoP, 2007) which sees growth of 90,000 people over the same time period. Hunter New England Health will plan their service provision to accommodate this growth of which Riverside is a part. The impact of the Riverside at Tea Gardens development is considered negligible as the full development of Riverside is anticipated to occur over a 15 year period.

In relation to general practitioners, the optimum ratio is generally one doctor per 1500 persons. The Myall Quays Medical Centre includes three general practitioners and room for a fourth, which can cater for the future population at Riverside and Myall River Downs at Tea Gardens. The Myall River Downs population together with the anticipated increase in population generated by Riverside is estimated to be 5,286 persons, which would generate the requirement for about 4 general practitioners (Duo, 2008). Additional services would be required when the Myall River Downs, North Hawks Nest and North Shearwater developments are completed, as these three developments are anticipated to generate an additional population of 3,800, which generates the requirement for another 2 ½ doctors.

5.4.4 Education

General Targets

There are 23 schools that can be accessed by bus from Tea Gardens, of which there are four high schools and five primary schools that have direct bus routes from Tea Gardens.

The Department of Education and Training (DET) has general guidelines for the provision of education facilities, which is based on the following ratios:

- primary school: one for each 2000 to 2500 dwellings;
- secondary school: one for every 6000 to 7500 dwellings;
- TAFE: one for every 100,000 dwellings; and
- special needs schools: one for every 20,000 dwellings (Duo, 2008).

Based on these ratios the proposed development on its own will not require additional schools in Tea Gardens because it will potentially create only 1045 new dwellings. The ability for the existing school facilities to accommodate the anticipated demand generated from the Riverside development is set out below.

Primary Schools

Based on the demographic profile detailed in *Section 5.4.1* and the 2006 educational attendance rates, the Riverside development will generate a demand for 120 primary school places over the next 14 years, with half arriving in the first six years (Duo, 2008). There is capacity within the existing school facilities to accommodate this growth as follows:

- Tea Gardens Public School is approximately 1.6 kilometres from Riverside and currently has around 218 students, with the capacity to continue to grow through the provision of additional demountable facilities at the school;
- Irrawang Public School is in Raymond Terrace and currently has 305 students with the ability to accommodate an additional 130 students;
- Bulahdelah Central School currently has 155 primary school places and could accommodate 50 more;
- St Brigids Catholic School is in Raymond Terrace which has 420 students with the capacity for an additional 25 students;
- Medowie Christian School has 302 students with plans in place to expand to be able to accommodate 800 students; and
- St Josephs Public School is in Bulahdelah and has 38 students with the capacity for up to 90 students (Duo, 2007a).

To assist with facility planning, Crighton Properties will communicate directly with the Principal of the Tea Gardens Public School regarding the progress of the Riverside development.

Secondary Education

Based on the demographic profile set out in *Section 5.4.1,* the Riverside development will generate a demand for an additional 98 secondary school places over the next 14 years, with half arriving in the first six years (Duo, 2008). There is capacity within the existing school facilities to accommodate this growth, indicated below:

- Bulahdelah Central School currently has 360 secondary school places and could accommodate 60 to 70 more without the need for more buildings;
- Medowie Christian School has 302 students with plans in place to expand to be able to accommodate 800 students; and
- Hunter River High School is located in Heatherbrae and has approximately 730 students and has the capacity to accommodate 100 more students.

Irrawang High School is located in Raymond Terrace and has around 1000 students. It does not have the capacity for further growth without the addition of more demountable units (Duo, 2008). Bulahdelah Central School however, has recently benefited by a $14 million upgrade and is one of the most modern schools in the NSW. It is also the only school listed above that

does not have other major growth areas in its catchment. Therefore it is likely to gain a significant proportion of students from Tea Gardens. To assist in the continued planning of the facilities of the school, Crighton Properties will advise the Principal of the school about the progress of the Riverside development.

Tertiary and Adult Education

The University of Newcastle is an hour by road from Tea Gardens and offers a range of undergraduate and postgraduate studies. There is also a TAFE at Tighes Hill in Newcastle and the University of the Third Age offers courses in Tea Gardens.

The community and telecommunication facilities provided in the proposed home business precincts offer residents the opportunity for distance education. Crighton Properties will have discussions with TAFE and the University of Newcastle about the potential for accommodating facilities that would facilitate community learning. These could be located in the multi use community facility or the business precinct hub near the Riverside commercial centre.

5.4.5 Recreation Facilities

Council acknowledged that to accommodate an expected population growth of the magnitude it predicted over the next 25 years, existing public services and facilities would need to be extended and other facilities may need to be provided (Great Lakes Council, 2003c). Council estimated that by 2011, all community facilities (such as community halls, centres and libraries) would likely be used to capacity (Great Lakes Council, 2003a). Existing recreational facilities are described in *Section 2.9* of this report.

Table 4.1 of the Riverside at Tea Gardens Recreation Study *(*ERM, 2008d*) (*refer to *Volume 3)* provides a summary of the projected population figures for the Tea Gardens / Hawks Nest area. The area of structured open space required to be provided by future development within Tea Gardens and Hawks Nest is detailed within Table 4.2 of the study.

The total area of structured open space required to support the existing and future population of Tea Gardens and Hawks Nest is 14.4 hectares. As identified in *Section 2.9.2*, there is a current oversupply of 1.5 hectares of structured open space.

All the structured open space required to be provided as a consequence of the development of the Riverside at Tea Gardens site (2.5 hecatres) is proposed to be provided at the Myall River Downs site in accordance with the Voluntary Planning Agreement which Council and Crighton Properties have jointly prepared.

5.4.6 Community Facilities

There are a number of community facilities existing in the Tea Gardens - Hawks Nest.

Community Halls

The main community hall is the Hawks Nest Community Hall. It can seat approximately 200 people. The Department of Community Services guidelines recommend one community centre per 7,000 – 10,000 population. The Riverside development will not reach this threshold, however a community centre is proposed within the commercial centre at Riverside. This facility is included in the draft planning agreement and will be provided in accordance with the timing indicated in the planning agreement. A brief will be prepared in consultation with Council to ensure that the facility provides the level of amenity the community requires.

It will be accessible from the residential areas in Riverside by cycle and pedestrian paths and will have a designated car park.

Library

Council has established a consolidated community facility and library at Tea Gardens. Council's s94 Report requires a branch library for 5000 persons. Given the other existing and future developments in the area, such as North Shearwater, Myall River Downs and North Hawks Nest, the SIA recommended that Crighton Properties consider a contribution to the upgrade of the library facilities.

Preschool

Hawks Nest / Tea Gardens Pre School is located in Hawks Nest and accommodates 20 children on each of the three days it is open. The Tea Gardens Childcare Centre offer long day care and preschool, five days a week. Council's s94 Report states that the current pre-school facilities are sufficient to accommodate anticipated growth in the area. In addition the approved child care facility at the Riverside commercial centre, once constructed, will supplement this service.

Other

Other community facilities include the Rural Fire Service facility in the industrial area of Tea Gardens, four churches and a post office located within Tea Gardens – Hawks Nest.

5.4.7 Employment

Riverside will contribute to attracting more jobs and working people to Tea Gardens, through the provision of home business lots. The project application includes 95 home business lots, which provides the opportunity for 95 small businesses to be established in Tea Gardens. The incorporation of these lots offer strong social benefit in terms of allowing people the opportunity to avoid the need to commute long distances, reduce demand on child care and prevent the social dislocation that is associated with long distance commuting (Duo, 2008).

In addition, the development of Riverside will have the following effects on employment and the economy:

- the estimated aggregate total output benefit of the construction phase of the project is $243 million, which will flow directly to the local community over the 15 year life of the project. This is expected to support 1,479 equivalent full time jobs;

- the construction phase of the retail / commercial component will support approximately 645 jobs, which equates to an estimated $21.7 million in wages and salaries;

- residential consumption activities will directly contribute an estimated $17.9 million per annum to the local economy base, which will support an estimated 107 equivalent full time jobs in the local area when complete; and

- jobs associated with the day to day operation of the site and ongoing capital maintenance will be created. For Riverside this it is estimated to equate to $2,115,000 to $4,230,000, which represents ten additional full-time direct jobs and 53 jobs overall (direct and indirect) (PB, 2007).

5.5 RETAIL AND COMMERCIAL

Assessing retail demand is largely dependent upon population projections. The coastal environment provides some constraints and restrictions on urban development and as the process of long-term strategic planning continues, efforts continue to refine population projections. This issue was identified in the previous *IBECON Tea Gardens Retail Study 2000* (IBECON 2000), which was written so that retail demand could be updated as population figures were updated.

The *Wakefield Planning Tea Gardens Retail Study – Update of IBECON's 2000 Study (*Wakefield 2007) provided an update using population projection figures produced by the Planning Workshop Australia in 2005, the most recent census information and various Council studies and reports.

According to the report, there is a high demand for the proposed Commercial/Retail development of the Riverside site, and it would be able to provide for the Tea Gardens and Hawk Nest area well beyond the year 2016.

Retail Hierarchy

Tea Gardens/Hawks Nest is a relatively isolated area. Raymond Terrace is the next logical level of hierarchy in terms of shopping, followed by numerous opportunities in the Newcastle region.

Based on floorspace and associated changes, Raymond Terrace is the only relevant shopping centre in relation to Tea Gardens/Hawks Nest. Raymond Terrace is 52 km by road from Tea Gardens, which is a considerable distance to travel for "weekly shopping needs". It is therefore appropriate to provide retail capacity in Tea Gardens/Hawks Nest at a higher level than might otherwise be expected, given its population. It will be important to have an appropriate balance between supermarket floorspace, specialty shops, restaurants and other retail outlets, such as medical services.

Forward Estimates

Forward projections can be determined by examining floor space per capita and then project this forward against future population figures. The relationship between floor space and population is shown in the *Figure 5.1*.

Projections extend until 2016 as floorspace/population ratios are only available to this date. Refer to the Planning Workshop Report 2005 for population projections to 2016.

Summary and Conclusions

Based on the area proposed for commercial / retail development, Riverside at Tea Gardens would be able to provide for, not only the foreseeable retail /commercial expansion of the Tea Gardens / Hawks Nest area up to 2016, but well beyond it. An indication of the growth which could be accommodated is provided below:

- the proposed Riverside commercial / retail development of approximately 40,000m^2, with a floor to site ratio (FSR) of 0.25 : 1 (typical of a single storey development) would likely yield a Gross Leasable Area of 10,000m^2; and
- if the same area were allowed to be developed at a higher FSR of 0.4 : 1 (typical of a 2-3 storey mix) then the Gross Leasable Area would increase to around 16,000m^2.

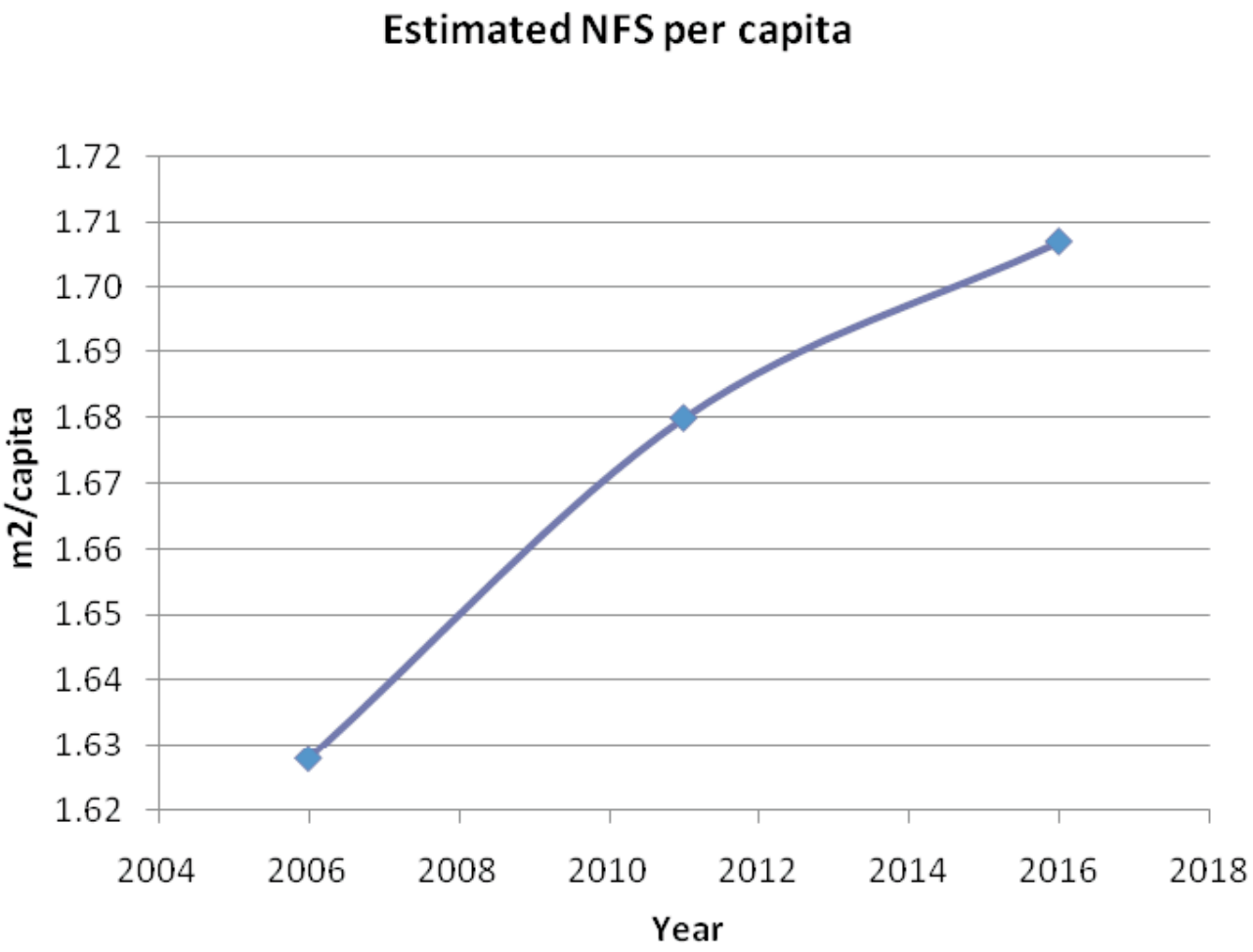

Figure 5.1

Floor Space versus Population Ratio

Client:	Crighton Properties Pty Ltd		
Project:	Environmental Assessment Riverside at Tea Gardens		
Drawing No:	0043707hv_EA_river_aug_15		
Date:	21/08/08	Drawing size:	A4
Drawn by:	JD	Reviewed by:	AA
Source:	Wakefield Planning Tea Gardens Retail Study, 2007		
Scale:			

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ERM

5.6 *CONCLUSIONS AND RECOMMENDATIONS*

Riverside at Tea Gardens is well served by education and medical facilities and has access to public transport and employment areas. The development offers the opportunity to significantly enhance the services and community facilities in Tea Gardens, which will build on the enhancement of services already delivered by the existing Riverside commercial centre.

To ensure that the community benefits from the development Crighton Properties commits to the recommendations of the SIA, namely:

- internal roads in Riverside will be sufficient to accommodate a bus route within walking distance of each dwelling (that is 400 metres);
- the development includes a comprehensive cycle network that connects all community facilities, the commercial centre and directly to Council planned cycle path network;
- contributing to the provision of a multipurpose community function / meeting facility, which will be delivered via a draft planning agreement with Council;
- keeping the Principals of both Tea Gardens Public School and Bulahdelah Central School informed of the growth of the school age population in Riverside. Crighton Properties will also discuss opportunities for courses run by TAFE and University of Newcastle to be conducted in the community facilities proposed as part of Riverside;
- provide a community building and telecommunications as part of the home business precincts;
- providing additional sporting and recreational facilities that will be consolidated on one site, as part of the Myall River Downs development. This will be a significant upgrade of current facilities and delivered via the draft planning agreement with Council;
- the existing commercial centre will be extended to provide the opportunity for a greater range of services and products to be provided to the Tea Gardens and Hawks Nest community; and
- Crighton Properties will provide the approved concept plan to the Population Health Unit of the Hunter New England Health Service, to assist them in the planning for preventative health.

6 CONSULTATION

This Chapter provides details of consultation that was undertaken with government authorities and the local community during the EA process.

6.1 INTRODUCTION

The stakeholder consultation approach adopted throughout the EA process was structured to provide open and transparent communication with the local community and key stakeholders. It provided a mechanism for dissemination of information about the project to these groups. Early stakeholder engagement enabled concerns raised by the community and government agencies to be identified early and addressed as part of the EA process.

6.2 AGENCIES AND OTHER AUTHORITIES

Relevant government authorities consulted during the preparation of the EA were:

- Great Lakes Council;
- Department of Planning (Sydney and Regional offices);
- NSW Department of Environment and Climate Change (DECC);
- NSW Department of Energy and Water ;
- Mid Coast Water;
- NSW Department of Primary Industries (NSW Fisheries);
- NSW Catchment Management Authority (Hunter and Central Rivers);
- NSW Department of Lands;
- NSW Maritime;
- Rural Fire Service;
- Karuah Aboriginal Land Councils (KALC); and
- NSW Marine Parks Authority.

Ongoing consultation and information sharing was undertaken with all the government authorities listed above during the EA process and preparation of the technical reports.

As outlined in *Section 1.1*, 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. A summary of key consultation activities with the Department of Planning (previously the Department of Infrastructure, Planning and Natural Resources) is set out below in chronological order. It clearly illustrates that Crighton Properties has consulted with the Department of Planning (DoP) over many years with regard to the project and the planning framework / process that relates to the project. Consultation undertaken includes:

- Crighton Properties met with DoP Officers (regional office) to discuss the initial project in 2002;

- a presentation of the initial project was made to the Coastal Council and DoP on 28 July 2003. Following this a revised submission to the DoP was lodged for separate EIS requirements and masterplan requirements, which was required to be prepared under SEPP 71;

- DoP provided Crighton Properties with draft SEPP 71 Masterplan requirements on 29 July 2003;

- a Planning Focus Meeting (PFM) was held on site on 28 December 2003 to discuss the master plan and various development proposals. The PFM was attended by DoP, DEC, Great Lakes Council and other agencies;

- the Director-General's requirements for the EIS were subsequently issued by the DIPNR on 5 January, 2004 for the artificial water detention body and the residential/tourist/recreational components. The Department also provided requirements for the preparation of a master plan for the development under SEPP 71;

- on 24 February 2004 the proposed waterbody was gazetted as being of State Significance. Following this, DoP notified Crighton Properties of the gazettal on 16 March 2004;

- on 5 March 2004 Crighton Properties provided DoP with the legal opinion of Malcolm Craig QC, confirming that the proposed development, including the water body, was not a 'canal estate';

- Crighton Properties met with DoP (Sydney) on 10 June 2004. At this meeting DoP informed Crighton Properties that the DoP considered the proposed development a canal estate and requested that 'other options' be investigated;

- Crighton Properties presented an options paper to DoP on 29 September 2004;

- Planning Focus meeting held in Tea Gardens on 28 November, 2004;

- on 1 December 2004, Crighton Properties met with DoP to discuss the revised proposal which no longer contained a golf course;
- on 31 December 2004 DoP advised Crighton Properties that the masterplan must reflect the outcomes of the Housing Strategy (have been incorporated in the outcomes of the Housing Strategy into the current proposal);
- in August 2005 Part 3A of the EP&A Act introduced;
- Draft Housing Strategy exhibited form October 2005 to January 2006;
- meeting with DoP (Hunter) to discuss transition of Riverside Project to Part 3A on 3 January 2006;
- Design Forum held at Tea Gardens from 1-3 February 2006;
- in a letter dated 1 March 2006 the DoP confirmed that the proposal was a project to which Part 3A of the EP&A Act applies;
- on 9 March 2006 Crighton Properties met with Great Lakes council to explain the current proposal;
- on 14 March 2006 Crighton Properties met with DoP (Newcastle) to explain the current proposal;
- on 26 April 2006 a community presentation held in Tea Gardens;
- in a letter dated 17 May 2006 the DoP (Sydney) acknowledge receipt of the Part 3A application, which includes a preliminary assessment report;
- on 23 and 24 May 2006 Crighton Properties forwarded a copy of the preliminary assessment report to Great Lakes Council and DoP (Newcastle), respectively;
- on 16 June 2006, Crighton Properties met with Great Lakes Council to discuss the Riverside concept plan and project application;
- on 22 June 2006, Crighton Properties met with DoP to discuss changes to the way in which the DoP wanted to deal with the Part 3A application;
- in a letter dated 28 June 2006 DoP advised that the project application was considered to be a combined Concept Plan and Project Plan;
- Housing Strategy adopted by Council in November 2006;
- a letter dated 28 December 2006 reported the revised D.G. requirements reflecting a performance based approach to impact upon the ground water aquifer;

- on 23 February, ERM met with DoP to discuss the progress of the Part 3A application;

- a letter dated 6 March 2007 reported the revised D.G. requirements that reflected the impacts on the oyster catchment area and cumulative impacts;

- a letter to GLC dated 10 April 2007 confirmed Crighton's offer to enter into a Voluntary Planning Agreement to cover developer contributions for the development of dwellings at Riverside;

- a letter to DoP dated 10 May 2007 outlined the background to the MQ development and included a chronology of negotiations with NSW Planning;

- a copy of the Options Paper that was presented to DoP in September 2004 was emailed to DoP on 21 May 2007;

- an email from DoP on 22 May 2007 confirmed that they already held the Options Paper and requested current engineering reports and supporting documents;

- an email was sent to DoP on 22 May 2007 asking for clarification of density targets arising from Housing Strategy;

- a letter dated 24 May 2007 sent to DoP provided an overview and discussed issues raised at meeting with Director-General Sam Haddad on 23 May 2007;

- a copy of the latest draft of the "Integrated Water Cycle Management Report" for Riverside was emailed to DoP on 30 May 2007;

- a progress update was sent to Chris Wilson of DoP on 13 June 2007, and copied to Sam Haddad and Richard Pearson on 14 June 2007;

- correspondence and attachments previously sent to Chris Wilson were forwarded in a letter to Sam Haddard on 14 June 2007;

- an email sent to DoP on 31 July 2007 requested a copy of their brief to Ecological Engineering and also requested meeting to discuss finalisation of the application;

- an email from DoP on 31 July 2007 advised that Ecological's report would be forwarded to ERM once it had been received by the Dept. and a meeting would be scheduled to discuss issues raised in the report;

- a meeting with DoP was held on 22 August 2007 to present our considered response to Ecological's report;

- a letter was sent to DoP on 10 September 2007 urging the Dept. to consider the "brackish water" solution for the lake;
- a meeting was held with DoP on 11 September 2007 to present the brackish/freshwater open space option;
- a letter sent to DoP on 13 September confirmed the resolve to pursue the brackish/freshwater open space option and not the saltwater option;
- an email sent to DoP on 14 September confirmed the resolve to revise the stormwater management solution for the site as per the concept plan presented at the meeting of the 11/09/07;
- a letter dated 20 September 2007 to DoP requested a meeting to discuss the proposed marine/tourist centre;
- a letter dated 10 October from the DoP confirmed the meeting of 16/10 to present final plans for the Part 3A Masterplan;
- at the meeting on 16 October 2007, Geoff Cox presented the final brackish water/open space proposal. Also discussed were the marine centre conditions and plans for landscaped screening between existing residential development and proposed new open space network. DoP requested formal lodgement;
- a meeting was held on 12 March 2008 with DoP to discuss adequacy review comments;
- a meeting was held on 2 September 2008 with DoP to outline how the comments arising from the adequacy review had been addressed: and
- a meeting was held on 20 January 2009 with DoP to outline how the comments arising from the second adequacy review had been addressed

6.3 COMMUNITY

A community consultation approach was adopted which was aimed to ensure that the community was engaged in a shared vision for the development of the site.

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 3* 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 – the 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 at quality streetscape to encourage walking;*
- *let us provide a model to guide growth areas in the future;*
- *let us develop a sens 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 is set out in *Section 2.4* and formed 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 very positive.

6.4 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 and project application.

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.

7 STATEMENT OF COMMITMENTS

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

7.1 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.

7.2 DRAFT STATEMENT OF COMMITMENTS

Crighton Properties is committed to minimising the potential for environmental impacts from the proposed development. *Table 7.1* 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 7.1 Draft Statement of Commitments

Item Number	Item	Commitment	Responsibility	Timing
1	Scope of Development	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. • Environmental Assessment Report (EAR), prepared by ERM, January 2009 and supporting reports; • Drawings R.C – 01, to R.C. – 50 prepared by Crighton Properties..	Crighton Properties	Ongoing
2	Statutory Requirements	The following licences, permits and approvals will be obtained and maintained for the subdivision and construction of infrastructure: • 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); • Country Energy Design Certification; • Country Energy Notification of Arrangement; • Telstra Compliance Certificate; • Department of Land and Property Information registration of the subdivision; • Section 73 Compliance Certificate from MidCoast Water. 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.	Crighton Properties	For the duration of subdivision

Item Number	Item	Commitment	Responsibility	Timing
3	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.
4		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.
5		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.
6	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
7		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.

Item Number	Item	Commitment	Responsibility	Timing
8		Construction of the subdivision will be generally in accordance with the Environmental Construction Management Plan, prepared by ERM, (2009), which includes: • waste management controls; • flora and fauna management; • noise and vibration control; • air and dust management; • stormwater and sediment control.	Crighton Properties	For the duration of the construction of the subdivision.
9		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.
10	Acid Sulphate Soils	All earthworks will be completed in accordance with the Acid Sulphate Management Plan included as Annex C in the *Proposed Subdivision – Riverside Estate Stage Project Application and Master Plan Area* prepared by Coffey Geotechnics (2008), and provided in *Volume 3* of the EAR.	Crighton Properties and contractors	For the duration of the construction of the subdivision for each stage.
11	Ecology	Implement the Koala Habitat Management Plan, prepared by Conacher Environmental Group (2008c), (provided in Appendix 3 of the Ecological Site Assessment in *Volume 3* of the EAR).	Crighton Properties and Community Association	During construction of precinct 3.
12		Implement the Ecological Site Management Strategy prepared by Conacher Environmental Group (2008b) (provided in Appendix 4 of the Ecological Site Assessment in *Volume 3* of the EAR) and preparation and implementation of a Wetland Management Plan (see the report by Winning 2009).	Crighton Properties	Prior to the release of the construction certificate for any stage of the development.
13	Bushfire Management	Asset protection zones will be established in accordance with Schedule 1 of the *Bushfire Protection Assessment – Riverside, Tea Gardens* report prepared by Conacher	Crighton Properties	Prior to the release of the Construction Certificate for

Item Number	Item	Commitment	Responsibility	Timing
		Environmental Group, 2008a.		the respective stage of construction.
14		A site specific fuel management plan will be prepared that outlines fuel management within the Asset Protection Zones.	Crighton Properties	Prior to the release of the Construction Certificate for the respective stage of construction.
15		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 Construction Certificate for the respective stage of construction.
16		A fire hydrant supply will be installed in accordance with Australian Standard S2419-1 (1994).	Crighton Properties	Prior to the release of the Construction Certificate for the respective stage of construction.
17		A Bushfire Evacuation Plan should 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.
18	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.
19		Any cultural material exposed within the development area, during ground surface disturbance works should immediately cease and a representative of the Department of Environment and Climate Change and Karuah LALC will be	Crighton Properties	For the duration of the construction of the subdivision.

Item Number	Item	Commitment	Responsibility	Timing
		contacted regarding further assessment of any cultural materials.		
20	Water Cycle Management	Design and install water quality control measures and monitoring program substantially in accordance with the *Integrated Water Management Strategy* dated 2008, prepared by Cardno Willing (refer to *Volume 3* of the EA) and Sheets 25 to 77 of the Project Application Engineering Drawings prepared by Tattersall Surveyors (provided in *Volume 2* of the EA).	Crighton Properties	Prior to the release of the subdivision certificate for each stage.
21	Water Quality	Prepare a water quality monitoring program for the Myall River to establish an understanding of background water quality.	Crighton Properties in consultation with relevant authorities.	Ongoing
22	Community Facilities	Four clubhouses and recreational facilities will be provided in the development. Separate applications will be lodged at a later date for the three clubhouses and recreational facilities for which concept approval only is currently sought. 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 Construction Certificate for the respective stage of construction.
23	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.
24		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

Item Number	Item	Commitment	Responsibility	Timing
25	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.
26		Infrastructure services will be provided generally in accordance with the drawings prepared by Tattersall Surveyors (refer to Servicing Strategy, *Volume 3*, EAR), namely Drawing Numbers: • 20600198, Water Servicing Strategy; • 20600220, 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 by an accredited certifier for the affected stage.
27	Roads and Drainage	All roads will be constructed in accordance with Sheets 5 to 24 (inclusive) of the Project Application Plans prepared by Tattersall Surveyors and provided in *Volume 2* of the Environmental Assessment Report.	Crighton Properties	Prior to the release of the Subdivision Certificate by an accredited certifier for each stage.
28		Drainage will be constructed in accordance with Sheets 5 to 9 and 25 to 63 (inclusive) of the Project Application Plans prepared by Tattersall Surveyors and provided in *Volume 2* of the Environmental Assessment Report.	Crighton Properties	Prior to the release of the Subdivision Certificate by an accredited certifier for each stage.

Item Number	Item	Commitment	Responsibility	Timing
29	Developer Contributions	Contributions will be made in accordance with Schedule 1 – Contributions Schedule in the *Voluntary Planning Agreement* between Crighton Properties Pty Ltd and Great Lakes (provided in *Annex E* of *Volume 1*, Environmental Assessment Report) and Sheets 2 and 3 of the Riverside Project Application Plans prepared by Tattersall Surveyors, (refer to *Volume 2*, Environmental Assessment Report) and includes: • contributions that relate to: 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	As detailed in Schedule 1 of the VPA.
30	Precinct Management	Precinct Management Statements will be prepared for each precinct in accordance with the précis provided in the Annex F and in accordance with any conditions of approval.	Crighton Properties	Prior to the release of the Subdivision Certificate by an accredited certifier for each stage.

8 CONCLUSION

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

8.1 JUSTIFICATION

8.1.1 Suitability of the Site

Location

The Mid North Coast is recognised in the draft 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. It was rezoned in 2000, and is suitable for low and medium density residential development, tourism, shopping, community and recreational facilities.

The site is well located to access, enhance and extend existing infrastructure and services. It is easily accessible from the existing road network, well served by education and medical facilities and infrastructure and has access to public transport and employment areas. Thus, the site is well located to accommodate an extension of the existing residential area.

Environmental Considerations

The comprehensive planning which has been undertaken has created an attractive environment for future residents. An assessment of the natural constraints of the site, urban capability, availability of public services, access to employment, commercial and community facilities and the provision in choice of housing and location were all taken into consideration when planning Riverside. The final layout has been based on technical investigations as set out in the preceding chapters.

Part of the site is zoned 7(a) Wetlands and Littoral Rainforest and 7(b) Conservation. Land in these zones will not be developed for residential purposes. The ecological value of the coastal wetland will be largely retained and 98 hectares of vegetation on site will be improved or maintained. The previously identified Aboriginal site within these wetland areas will not be affected by the development. The newly identified Aboriginal site will be protected by a buffer and a management plan will be prepared in consultation with the local Aboriginal community to ensure its values are respected.

The subdivision has been designed to incorporate a range of bushfire mitigation management measures that include asset protection zones, appropriate road design and layout, access to water and the appropriate selection of landscaping species.

Investigations of traffic flows at the intersection of Myall Street and Shoreline Drive indicated that the existing road network as augmented by the proposed development will be able to accommodate traffic generated by the development.

An assessment of the operation of the existing intersection along Myall Street is adequate to cater for the flows associated with the development of the site for both the current 2007 and 2017 design years. The proposed intersection along Myall Street will also be adequate, as it will be constructed to the same standard.

Investigations of the capacity of existing infrastructure to accommodate the proposal indicated that reticulated water supplies, a reticulated sewer, a 'state of the art' vacuum sewer pumping station and electrical and communication services are all available to the site and can be extended to serve the development.

Stormwater management for the site has been the subject of exhaustive studies and a best practice stormwater strategy has been incorporated into the integrated water management strategy or the estate.

8.1.2 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.

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 and project application incorporate a range of community facilities, which will build on the enhancement of services already delivered by the existing Riverside commercial centre. This includes the provision of a new community building, ability for internal roads to accommodate a bus

route, a cycle and pedestrian network that connects all community facilities, the expanded Riverside commercial centre and a commitment to consolidate sporting and recreational facilities on one adjacent site as part of the Myall River Downs development.

Environmental

Riverside provides an orderly extension to the existing residential area, in a manner that responds to the sensitive coastal environment. The Project Application and Concept Plan incorporate 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.

Economic

The economic benefits of the construction phase are significant totalling approximately $640 million in output and supporting 3,893 equivalent full-time jobs. Of these, around 1,374 jobs will be directly associated with the construction of the facilities.

The local community will also benefit significantly from the proposed development during the construction phase as 40 percent of the aggregate total output benefit, or $256 million, will flow directly to the local community. This translates to a local benefit of $256 million supporting 1,557 local jobs across all sectors, spread across the anticipated 10 year life of the project (Parsons Brinkerhoff, 2007).

The retail / commercial component of the proposed development, via the construction of 15,500 square metres of commercial and retail space, will support 645 jobs and generate an estimated $21.7 million in associated wages and salaries. The spend benefits associated with this level of activity are estimated at $8.7 million per annum for the local economy with a median multiplied output effect of $15.2 million (Parsons Brinkerhoff, 2007).

Residential consumption activities will directly contribute $19.0 million per annum to the local economy based on the increase in population of 2,612 residents. Normal consumer spending patterns would indicate that this level of spending will consequently support 113 jobs in the district upon completion of the project (Parsons Brinkerhoff, 2007).

Other activities associated with the development including the management and maintenance of the infrastructure developed as part of the proposal will create jobs associated with the day-to-day operation of the site and on-going capital maintenance. The industry estimate of these annual outgoings is in the range of 1-2% of the capital value of the development. For Riverside at Tea Gardens this would be $2,115,000 to $4,230,000. This would represent an additional 10 full-time jobs (Parsons Brinkerhoff, 2007).

The economic benefits to the Tea Gardens/ Hawks Nest area created by the Riverside proposal will facilitate the growth anticipated by the draft Mid North Coast Regional Strategy (MNCRS) 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.

8.2 CONCLUSION

The preparation of the project application and concept plan for Riverside has involved input from a range of disciplines including engineering, heritage, water, planning, traffic, ecology, bushfire and socio-economics. It has evolved in response to consideration of the suitability of the site and technical investigations to ensure that the proposal responds to the built form, character and environmental features of the site. The input provided by the local community and the strategic direction for Tea Gardens formulated and adopted by the relevant local and State authorities has also been a major factor influencing the Riverside proposal.

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