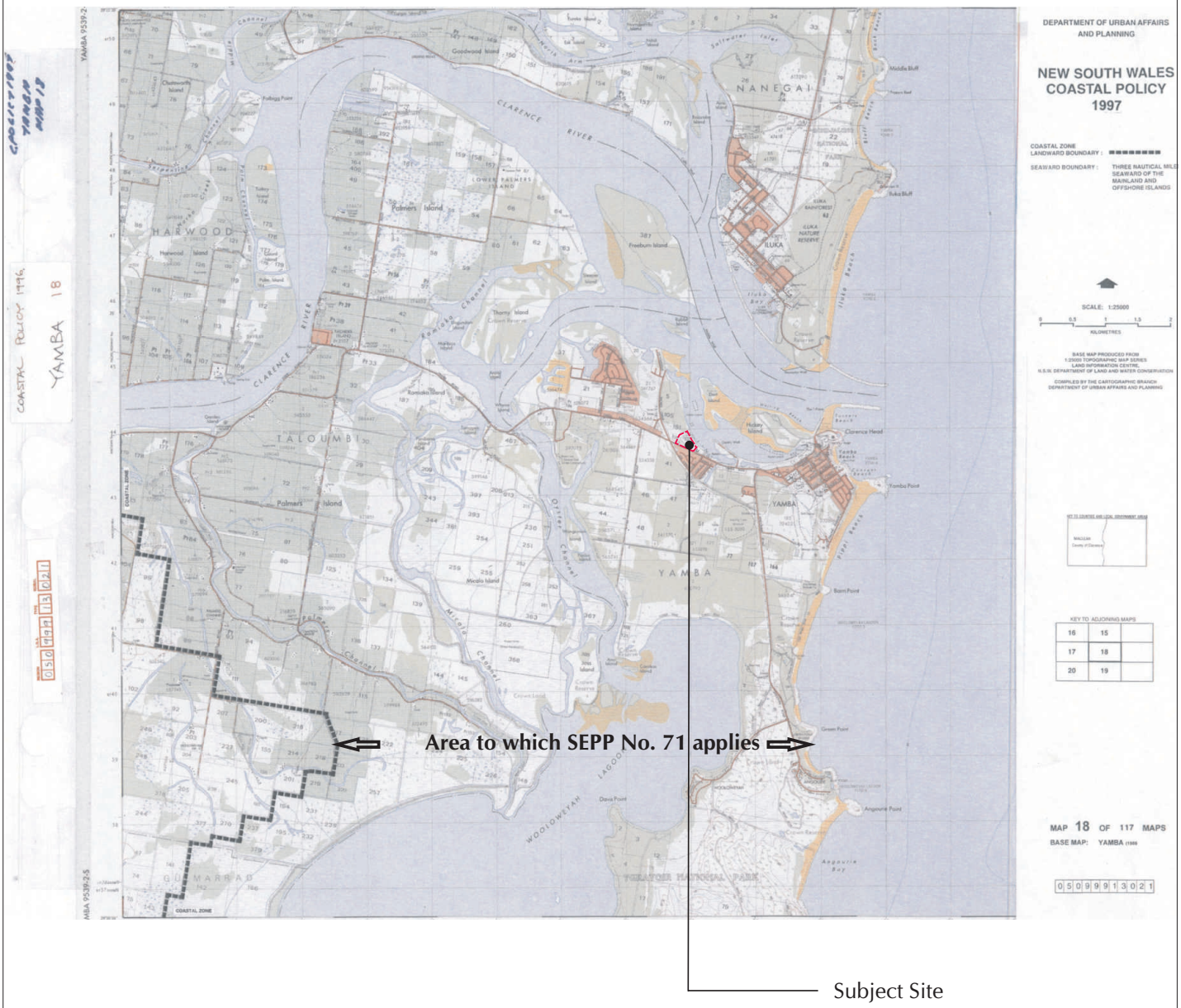

SEPP (Major Projects) 2005 and SEPP No. 71

Sensitive Coastal Location - means any of the following which occur within the coastal zone:

(a) land within 100m above mean high water mark of the sea, a bay or an estuary,
(b) a coastal lake,
(c) a declared Ramsar wetland within the meaning of the Environment Protection and Biodiversity Conservation Act 1999 of the Commonwealth,
(d) a declared World Heritage property within the meaning of the Environment Protection and Biodiversity Conservation Act 1999 of the Commonwealth,
(e) land declared as an aquatic reserve under the Fisheries Management Act 1994,
(f) land declared as a marine park under the Marine Parks Act 1997,
(g) land within 100m of any of the following:
(i) the water's edge of a coastal lake,
(ii) land to which paragraph (c), (d), (e) or (f) applies,
(iii) land reserved under the National Parks and Wildlife Act 1974,
(iv) land to which State Environmental Planning Policy No 14—Coastal Wetlands applies,
(h) residential land (within the meaning of State Environmental Planning Policy No 26—Littoral Rainforests) that is within a distance of 100m from the outer edge of the heavy black line on the series of maps held in the Department and marked "State Environmental Planning Policy No 26—Littoral Rainforests (Amendment No 2)".

SEPP (Major Projects) 2005 and SEPP No. 71

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6 CONSULTATION

6.1 Consultation Process

The proponent, Blue Dolphin Development Joint Venture Company (BDDJVC), and the consulting team have engaged in consultation with relevant government agencies and the local community at various phases of the design development of the concept plan.

6.2 Community Consultation

The proponent engaged Sustainable Futures Australia to develop a community engagement and consultation program, the first two stages of which were completed in May 2006, prior to the first submission of the concept plan in August 2006 and included:

- Public workshops;
- Holidaymaker workshops;
- Focus group of conservation group representatives; and
- Face to face interviews with local residents, including residents along Yamba Road adjacent to the development site.

Information regarding the initial design development of the proposal was also distributed to the local community via two newsletters.

The findings of the first two phases are outlined in the Community Consultation Report, prepared by Sustainable Futures Australia, which formed part of the first submission and is included again at **Appendix 2.**

The components of third and fourth phases of the community consultation program were to include:

- Presentation of design and management responses to the previous issues raised by the community;
- Local display of the concept plan; and
- Release of a newsletter to detail the lodgement of the concept application.

There is the opportunity for the elements of these phases of the program to take place during the public exhibition of the concept plan.

6.3 Consultation with State and Local Government Departments

An appropriate update of consultation has taken place in the formulation of this environmental assessment as summarised in **Table 6.1 – Further Consultation with Government Departments** below.

The development of the concept plan contained in the original submission was carried out in the context of the consultation undertaken by Sustainable Futures Australia. The details of consultation with public authorities undertaken prior to the original submission were set out in Section 4 of the original submission prepared by Sustainable Futures Australia, reproduced at **Appendix 2** of this report.

Further post-lodgement consultation with government agencies has been coordinated by Jones Lang LaSalle, as the appointed project mangers, and is summarised in **Table 6.1**.

Further liaison and consultation with the Department of Planning has been undertaken by Planning Workshop Australia during the preparation of this amended concept plan application.

Table 6.1 – Further Consultation with State and Local Government Departments

Agency	Preference	Section of Report in which this is addressed
NSW Rural Fire Service	In terms of Bushfires and APZ's, the NSW Rural Fire Service indicated that the relevant APZ according Planning for Bushfire Protection is 30 metre APZ for residential buildings and a 40 metre APZ for 'tourism' buildings.	The Bushfire issue is addressed in **Section 7.7** of the report and in the Bushfire Risk Assessment at **Appendix 9**. Measures have been proposed to ensure that the 30 metre APZ provided is acceptable.
Clarence Valley Council - North Coast Water (Jim Fear)	In terms of water supply, North Coast Water advised that the existing main and the water volume available will be sufficient for the "Dolphin Blue" Development.	This is addressed in **Section 7.9 & 9.2** of the report and in the Infrastructure Provisions Report in **Appendix 17**.
Clarence Valley Council - North Coast Water (Greg Mashiah)	In terms of sewer services, North Coast Water advised that the existing main and the volume available should be sufficient for the "Dolphin Blue" Development.	This is addressed in **Section 7.9 & 9.2** of the report and in the Infrastructure Provisions Report in **Appendix 17**.

Agency	Preference	Section of Report in which this is addressed
Country Energy	In terms of electricity, Country Energy advised that the load can not be supplied from Country Energy's low voltage network in the area. Their preference was the provision of a high voltage feeder to be installed from Country Energy's high voltage network to site and then distribute by installing substation(s).	This is addressed in **Section 7.9 & 9.2** of the report and in the Infrastructure Provisions Report in **Appendix 17**. Country Energy's preference is incorporated into proposal.
Roads and Traffic Authority (RTA)	The RTA prefers a single access point and access to be "left turn in/left turn out only". They prefer right turns in and out to be prevented by a raised median along the frontage road, and to re-circulate traffic wanting to make a right turn via the nearest roundabout. RTA did not favour a marked pedestrian ("zebra") crossing where clear numerical warrants in terms of numbers of pedestrians were not met.	This is addressed in **Section 7.2** of the report and in the Transport and Traffic Impact Assessment in **Appendix 14**. Two access points are being provided to improve safety and to allow turning volumes to be dispersed. The proposal incorporates the RTA's preference in relation to pedestrian crossings, includes funding and construction of a raised central median on Yamba Road and a contribution to a roundabout at the intersection of Yamba Road and Shores Drive to create the leftin/ left-out traffic flow with right turn recirculation via roundabouts.
Clarence Valley Council	In terms of flooding, advice from Council indicated that full modelling was not necessary for the site to assess the effects (in terms of the floodplain development manual). Minimum floor levels were set at Councils Flood Planning Level (FPL) as advised by Council as RL 2.7m.	The issue of flooding is further detailed in **Section 7.3 & 9.6** of the report and in the Sustainable Water Management Report in **Appendix 18**.

7 ENVIRONMENTAL ASSESSMENT – CONCEPT PLAN

7.1 Built Form and Design

7.1.1 Existing Environment

The site currently consists of 235 holiday cabins and powered caravan and camping sites (which currently includes 92 manufactured one and two bedroom cabins). In addition, the resort contains a service station and convenience store; a take-away food store and restaurant area; a resort office and residential complex; conference rooms; and outdoor recreational facilities.

The site is located adjacent to the Moby Dick Motel which is (2 storeys in height) (situated to the south east), the Clarence Estuary Nature Reserve (situated to the north west), with the Clarence River and waterfront reserve situated at the rear of the site (east). The southern boundary of the site is bounded by the Yamba Road, across from which are low density detached dwellings. The surroundings of the site are therefore varied in both form and design.

The proposal has been separated into three stages of development, with Stage 1 including two residential blocks for which project approval is being sought (buildings 1 & 2 on the concept plan). Stage 2 will include the tourist accommodation (buildings 9 & 11-15 on the concept plan). Stage 3 will include additional residential accommodation (buildings 3-8 & 10 and the villas on the concept plan).

7.1.2 Potential Impacts

In order to reduce the scale and bulk of the proposal, the building heights have been redesigned from the original scheme. This has resulted in the reduction in the heights of the majority of the buildings along the Clarence River frontage to two storey villas and the increase in height of the centrally located buildings to four and five storeys. The proposal has been redesigned to ensure more appropriate development for the site, taking into account the existing form and design of the surrounding development. The height, setback, form and axis orientation is varied throughout the development, in order to avoid the creation of a wall of buildings effect. This, through careful landscaping and orientation of buildings, will assist in reducing the impact on the adjacent existing developments.

Bulk

As discussed above, the scheme has been amended which has resulted in reducing the bulk of the proposal. The original scheme included the provision of 4 storey residential units along the Moby Dick Motel and waterfront frontage; 3 and 4 storey residential buildings along the Yamba Road frontage with 2 storey residential villas in the centre of the site and a mix of 2 to 4 storey tourist accommodation on the Clarence Estuary Nature Reserve frontage. This tended to create the effect of a wall of building on the Yamba Road and waterfront frontage. This in turn reduced the views available through

the buildings to and from the Clarence River and Yamba Road and as such was bulkier in nature.

In order to reduce the bulk of the proposed buildings, a number of measures have been taken. This included varying the orientation of the buildings, staggering buildings more effectively and varying building heights.

The amendments included reducing the number of buildings fronting Yamba Road and reducing the height of a number of these residential buildings from 3 and 4 storeys to 3 storeys; relocating the residential villas located in the centre of the site to the Clarence River frontage; increasing the residential building heights in the centre of the site from 4 storeys to 4 and 5 storeys and increasing the tourist accommodation buildings from 2- 4 storeys to 3 and 4 storeys. In short, the revised concept plan significantly redistributes bulk and scale from the waterfront reserve to the central portion of the subject site and creates a more modulated and reduced scale of buildings along Yamba Road.

These amendments have re-orientated and staggered the proposed residential buildings along the Yamba Road and waterfront frontage thereby increasing the views and vistas through the buildings. This has assisted in reducing their perceived bulk and prevented the creation of a wall of buildings.

In addition, the height of a number of these buildings has been reduced along the frontage, thereby reducing the impact on the neighbouring properties and on views from Yamba Road. This variation in height has assisted the proposal to better fit within the predominant mature tree line and as such is now better assimilated with the existing surrounding environment.

Design

The buildings have been designed to respond primarily to internal/external functions (connection with landscape, lifestyle spaces, daylight, indoor-outdoor connectivity) and also to integrate the buildings into the local context with a considered balance of bulk and scale. The buildings have been designed to achieve high density development as per the objectives of the Maclean LEP for this site. This has resulted in the creation of a mix of two to five storey buildings, carefully sited and orientated throughout the site. The lower buildings have been located on the more sensitive frontages of the site (i.e. The Clarence River and The Yamba Road), with the majority of the taller buildings being concentrated in the centre of the site.

The maximum height limit according to the Clarence Valley Residential DCP is 9 metres and the proposal exceeds this. Despite this however, building heights and forms have been designed in response to the general context of the site and as such are varied across the site to create a sense of individuality to each building. The setbacks to the boundaries of the site are varied and exceed minimum requirements, allowing deep landscaping to be incorporated into the design of the site.

The materials used are 'reflective of place' and have been selected to consider the site's context in terms of appearance and proximity to the surrounding environments. Balustrades are designed to provide unobstructed views from within all living spaces

whilst providing some privacy from internal streets. In addition, the upper floors of the buildings have been set back in order to reduce their bulk.

The roof set-outs and 'silhouette' design is informed largely by existing roof types in and around Yamba, with an emphasis on larger roof overhangs, lightweight materials and 'coastal' roof forms. All materials used will be consistent with those used in the surrounding area, with reflective or bright materials being avoided. This will ensure the buildings are more in keeping with the character of the area.

In terms of the internal layout and design of the proposal building, detail is only available for the Stage 1 residential building, however the same design principles will be adopted in the Stage 2 and Stage 3 development. All of the stage 1 apartments are north east facing, with 84% of the apartments in Building 1 and 2 being naturally cross ventilated. Over 84% of the units in Buildings 1 and 2 have either dual or triple aspect, with just 9 units having single aspect. Apartments are generous in size and consist of a mix of one, two and three bedroom apartments, including penthouse apartments, each of which has a generously sized balcony. The internal layout of the units is such that they provide flexible layouts that allow for a range of activities and uses.

The design principles adopted for buildings 1 and 2 will also be incorporated into the Stage 2 and 3 buildings.

Visual Impacts and Vistas

In order to reduce and minimise the visual impact of the proposed development, the proposed buildings have been staggered and varied in height. This has helped to reduce the bulk of the proposed buildings and also aids in creating views and vistas through the development both for the public and the residents of the proposed developments. In terms of the visual impact on the residences along Yamba Road, design features have been put in place to reduce impact, such as the use of glass in the balconies to assist visual permeability through the buildings and setting back the upper floors of the buildings. Further measures include the provision of increased setbacks along Yamba Road and the incorporation of dense landscaping along these setbacks. The building heights have been varied and a smaller building footprint has been created in order to allow good pedestrian and visual permeability into the site.

In order to reduce visual impact on the features, the proposal has been designed to comply with DCP setbacks of 6 metres in relation to front setbacks and 3 metres, in relation to side and rear setbacks. The building heights along the Clarence River boundary have largely been reduced to two storeys and the buildings staggered in order to avoid creating a wall of buildings effect. This has consequently increased the views and vistas available from the southern section of the site. The centre of the site now contains two 4 storey and one 5 storey building. The orientation of these buildings are varied and in order to minimise impact, the upper floors have been setback, whilst building materials such as the glass balustrades have been used to aid in reducing the bulk of the buildings. This together with the setback of the buildings from Yamba Road and the Clarence River will help to reduce the impact they will have not only on the immediate surroundings of the site but also when viewed from for example Yamba Hill. This is evident from the perspectives produced by Woodhead architects (Ref. CP010).

A Landscape Plan, produced by SCAPE (see Appendix 3) includes the provision of a number of landscaped areas, as follows:

- Yamba Road buffer;
- Southern buffer;
- Clarence River Foreshore Park;
- Dolphin Blue Resort & Environs; and
- Residential Community.

The Landscape Plan incorporates the planting of these landscaped areas with a mix of native plant and tree species relevant to the use of that particular area, for example the residential areas are given a different landscaped treatment to the resort facility. The aim of this variation in landscaping is to reinforce spatial definition, provide solar/shade management and privacy screenings.

Photomontages have been created in order to demonstrate the visual impact of the proposal when viewed from certain locations. These include:

- The view from the Clarence River to the site;
- The view from west of the waterfront;
- The view from Yamba Road to the site; and
- The view from Yamba Hill to the site.

In addition, drawing LSK 001 indicates the mature trees that will be retained during the construction and operation of the site. These photomontages show that the building height has been designed to generally fit within the predominant mature tree line on the subject site, waterfront reserve and adjoining land to the west of the subject site. This will ensure that the views to and from the site are not detrimentally compromised. This is further reinforced by the proposed materials that have been incorporated into the building design, whereby materials are 'reflective of place' and have been selected to consider the site's context in terms of appearance and proximity to the surrounding environments. In addition, glass has been utilised in the balconies to assist visual permeability through the buildings.

The redesign of the proposal provided an opportunity to identify and create additional views and vistas throughout the site. The views created include those to and from the Clarence River and Yamba Road, created in the area between the tourist and residential accommodation (the area between Stage 2 and 3); those to and from the Clarence River and Yamba Road created through the staggering of the residential villas along the Clarence River. In addition, views have been created to and from the Clarence River

and Yamba Road between the Stage 1 and Stage 2 residential buildings. These views and vistas are illustrated in the Concept Diagram, Drawing Ref. CP 003.

Overshadowing

An assessment of the level of overshadowing on the adjacent Moby Dick Motel and the Clarence River and Beach at various times during the day, during the winter and summer months was carried out as part of a Merit Submission submitted in support of the concept plan (see Appendix 13). The relevant shadow diagrams are Drawing Ref. CP008 -009 at Appendix 3.

As discussed above, the site contains an existing tourist facility, where buildings are a maximum of one storey in height. The site and adjacent waterfront reserve contains mature trees. A degree of overshadowing occurs on and adjacent to the site as a result.

Detailed discussions are set out in the Merit Submission and in summary conclude that:

- Minimal additional overshadowing will occur on the beach and waterfront open space during the winter months, where overshadowing already exists as a result of existing mature trees;

- The effect of the overshadowing that will occur at 7pm in the Summer months will be marginal given the current overshadowing caused by the existing mature trees. It is considered the marginal overshadowing will be compensated by the provision of additional open space on the site and indeed the provision of access to the waterfront open space;

- There will be no adverse impact on the recreational use of the reserve;

- Incorporating public pedestrian access to the otherwise landlocked waterfront reserve has significant public benefit;

- Providing additional private and public open space outweighs the marginal proportion of overshadowing that will occur part of the year on the adjoining waterway; and

- A reduction in the height limit resulting in increased site coverage would not reduce the overshadowing that already exists along the waterfront reserve and on the waterway, and would in fact reduce landscaped open space or reduce density in a zone which expressly encourages consolidation in the form of high density development objectives.

Given the fact that overshadowing at present is caused by existing vegetation, and overshadowing caused by the proposal will be marginal, no mitigation measures are proposed.

Privacy

At present, the site consists of a maximum of one storey buildings and contains a large degree of mature trees. As a result of this, very little overlooking occurs on the adjacent Moby Dick Motel or on the residents along Yamba Road.

Visual privacy for the dwellings has been maximised by the provision of adequate separation distances between the habitable rooms of the development, the adjacent Moby Dick Motel and public spaces. Privacy has been further increased by increasing setbacks.

The orientation of the balconies to the north west and the separation distances between the balconies and habitable rooms ranging between 11 metres and 32 metres (see Drawings CP 103 - 105) in the Stage 1 buildings ensures adequate privacy. The principles of design will be repeated in the design and development of Stage 2 and 3.

Certain design features have been incorporated to ensure that the privacy of the residents located across Yamba Road and the Moby Dick Motel is not compromised. This includes:

- Windows on the eastern boundary of the development have louvres which will allow light/views while also providing privacy into the residential units and the Moby Dick Motel.

- The proposed landscaping along the eastern boundary will provide additional screening between the proposed buildings and the motel.

- Residents across Yamba Road will be provided with adequate privacy due to increased setback lines and dense landscaping within the building line.

- Appropriate building location and design and landscaping to ensure privacy of residents and the public in the northern sector involving the foreshore area.

In conclusion, the development has been designed using careful orientation, siting, setbacks and landscaping treatment to ensure minimal loss of privacy between the proposed buildings themselves and indeed the adjacent residential and commercial buildings.

Landscaping

The site contains clusters of native and introduced species, both coniferous and deciduous, scattered throughout the site.

The Landscape Report prepared by SCAPE, states that it is proposed that *"the landscape character draws upon the coastal vegetation and themes which will be reinforced with structured planting"*. It is anticipated that this will deliver both functional and aesthetic outcomes. SCAPE proposes that the new development will *"embrace the existing vegetation on the site and draw upon the adjoining coastal vegetation in the Clarence*

River Estuary Reserve for native species selections". The underlying principle of the proposed landscaping scheme is to recognise coastal environment conditions, fire management issues and prevailing winds. The proposal will involve the removal of some of the existing trees and that some may be lost due to the building footprints and the change in the water table during construction, however the Landscape Plan includes the planting of additional trees throughout the site. Existing landscaped areas will be reinforced with further plantings of suitable native and rainforest species. The Landscape plan anticipates that the landscaped areas will have a 'mixed planting palette', with a combination of flowering canopy trees and native palms.

Over land stormwater flow corridors will be provided as turf swales or as structured 'natural creek bed' landscape elements. It is anticipated that these will discharge to the river or into the drainage channel located along the western boundary of the site. The proposal includes the incorporation of both storm water over land flow drainage storage and a roof water tank system to manage water on the site. From the latter, harvested roof water will be used as the primary water supply for landscape water elements and a low drip irrigation system.

Landscape lighting, paved thresholds and specimen tree/palm plantings will be incorporated in the creation of formal entry nodes within the site. A private path network within the site will connect the residential units with the recreational areas. Path treatments throughout the site will include concrete and modular unit concrete pavements and timber deck boardwalks. A combination of formal paths and shared road access will connect Yamba Road to the river foreshore. Along the river foreshore park, a continuous formal path and nodal network will be retained. This will include provisions for pathways to be extended in the proposed development and to adjoining land uses.

The Landscape Report identifies six different landscape precincts each of which will have a landscaping scheme specific to it. These are identified in Drawing Ref. LSK-004/C.

Clarence River Estuary Reserve is identified as Precinct 1, which contains a healthy coastal swampland vegetation community and buffer. The report identifies an existing walking track along the western side of the storm water drainage corridor (which is outside the development boundary). A Bush Fire Protection Zone of 30 metres is established between the boundary and the resort buildings, which will incorporate a low impact shrub and groundcover planting structure. This will include select trees and an open grassed area. In addition, fire resistant species will be included.

Yamba Road is identified as being Precinct 2. The report identifies that at present, the existing streetscape character includes a number of native tree and weed species. It is proposed that these weed species be replaced with a suitable native tree selection. The report anticipates that landscaped areas will provide visual screening along Yamba Road as well as protecting the site from southerly winds through the use of a structure tree and understorey planting in combination with earth profiling/mounding.

Precinct 3 includes the **Southern Buffer** and includes a 6 metre wide setback which will include a "deep" landscape area of native species.

The Clarence River Foreshore Park (Precinct 4) is identified as containing an existing 20 metre leased reserve between the river and the site and which is outside the development boundary of the site. The landscape plan will not result in any existing trees being removed but will include planting select understorey planting and native grasses to supplement and protect the base of existing tree groups.

The Dolphin Blue Tourist Accommodation & Environs is identified as being Precinct 5. The landscape plan includes the creation of a "rainforest" landscape character in order to define a relaxed resort experience. This will incorporate naturalistic and formal water and pool elements, elevated decks, entertaining terraces, play spaces and café terrace. The landscape plan proposes to include *"a rich palette of rainforest and coastal species, which will include flowering trees, palms and a colourful understorey of shrubs and ground covers"*. In addition open grassed areas, earth mounding and screen plantings to the immediate accommodation wings will reflect a rolling "dunal" landscape character.

Precinct 6 includes the **residential community**, which includes the apartments and villas. The landscape plan states that the landscape character will be typified by flowering canopy trees, palms and formalised shrub planting. It is intended that this will reinforce the spatial definition and provide solar/shade management and privacy screening to apartments. Private recreational amenities such as terrace areas, pools, play areas and water elements will be centrally located and will have pedestrian links to the rest of the site. Landscaping will be installed on natural ground level, and on podium slab applications on areas above the car park basements – this will require raised planters to be integrated with the architecture. In terms of the villas, select trees will supplement existing trees and shrub hedging will be used to demarcate property boundaries.

The Landscape Plan confirms that *"appropriate tree management and erosion/sedimentation practices will be adopted throughout all phases of the project"* and that *"the integration of water management practices and water reuse for landscape irrigation will aid in the establishment and long term viability of the landscape"*. Given the careful selection of native species and the careful consideration of species in terms of their functions, the landscaping of this site can only serve to improve the existing environment and consequently aid in ensuring the proposal is assimilated into the existing environment thereby reducing its impact.

Additional details regarding the design of the proposal and its impact are detailed in the Design Statement, prepared by Woodhead architects at Appendix 15.

7.2 Traffic and Access

7.2.1 Existing Environment

A Transport and Traffic Impact Study (TTIS) was prepared by ARUP (Appendix 14). This report assessed the current environment is relation to traffic and access and the impact of the proposed development on traffic levels and consequently presented solutions to ensure minimal impact by the proposal.

The report identifies that the site is currently accessed via:

- a wide four-lane driveway to Yamba Road; and

- a second driveway to the petrol station forecourt.

Yamba Road is identified in the report as being a "classified road" (MR 152) and a regional main road serving Yamba. It is described as being a two-lane two-way single carriageway sealed road with a wide sealed shoulder marked for bicycles. The Traffic Assessment established that Yamba Road has an Annual Average Daily Traffic rate of 8,000 vehicles per day at present, but that traffic volumes vary widely according to the holiday industry activity in the town. The site currently provides 628 car parking spaces throughout the site for visitors and staff. In terms of Peak Hour Site entry and exit, the report concluded that the site currently generates approximately 440 vehicles per hour.

The TTIS advises that the site is served by a local bus service, operated by Busways North of Yamba, with bus stops and shelters located on both sides of Yamba Road. This service operates approximately every 2 hours, 6 times per weekday and four times on weekend days and public holidays. In terms of bicycles, it states that Yamba has a relatively extensive bicycle route network, with marked bicycle lanes provided on the road shoulders of the site frontage. There is a foreshore path in the site, but this does not extend to the nature reserve (west of the site) or to the Motel (to the east). The report concludes that there are no formal pedestrian crossing points on Yamba Road in the vicinity of the site.

In terms of rail access, the report identifies that there are three daily train services between Sydney and Grafton and onto Brisbane with the nearest major railway stations being at Coffs Harbour to the south and Casino to the north.

The report indicates that a Yamba Traffic Study, update in 1999 and subsequent a Yamba Road Network Strategic Study[1] have been undertaken in order to devise a preferred traffic management strategy for Yamba, quoting the report as stating

> *"this study and the previous Yamba Traffic Study Update, 1999 indicate that future growth projections for Yamba will not require construction of an urban road bypass, as the existing Yamba Road will operate at a good level of service over the next 20 year planning horizon and beyond. However, it is recommended that capacity along Yamba Road be improved by implementing demand management measures combined with an upgrade of connecting road intersections. This process will make the urban road bypass, which has a high capital cost and low economic justification, unnecessary. In addition, use of demand management accords with best practice and current standards and guidelines in traffic management. Scenario 1, upgrading Yamba Road with demand management, is therefore recommended as the preferred traffic management strategy for Yamba."*

[1] Yamba Road Network Strategic Study, Urban Research and Planning Pty Ltd (URaP)

7.2.2 Potential Impacts

The proposed development includes the provision of two vehicular access points onto the frontage road (Yamba Road); one at the western end to service the holiday accommodation and one near the existing Blue Dolphin access point to the residential access point. It is intended to define the circulation hierarchy through the use of pavement materials, colour and way finding system. Formal entry nodes will denote the respective entries including signage wall elements, landscape lighting, pavement thresholds and tree planting.

ARUP has consulted with the RTA, whereby the RTA expressed a preference to the provision of a single access point and that access should be "left turn in/left turn out only". This was acknowledged by the design team, but it was concluded that two access points would be more beneficial to the site and surrounding area than a single access point. The reasoning and benefits of providing two access points are detailed in Table 7.1 below.

Table 7.1

Issue	One Access Driveways	Two Access Driveways	More than two Access Driveways
Legal	Shared Access /Easement problems	The two entry points provide access to two separate lots.	More driveways than lots
RTA policy	Complies	Complies with the spirit of RTA policy, only one access to each Lot with a discrete land use	Does not comply
Road safety	Good	Good	Moderate
Precedent	Less driveways than currently exist.	There are currently two separate access points , one for the service station and one for the Blue Dolphin park.	More driveways than exist
Through Traffic	High.	Medium	Low
Pedestrian and bicycle access	Longer walking and cycling distances	Reduced walking and cycling distances	Reduced walking and cycling distances
Way finding and signs	Complex within site, with holidaymakers stopping/getting lost/"jack-knifing" reversing trailers in residential areas.	Simpler, with two separate functions of holidaymakers and residents	Multiple decision points along Yamba Road
Emergencies /Fire	Indirect access, No redundancy if blocked	Robust with redundancy	Robust with redundancy
Staging	Conflict of existing and Stage 1 operations and construction traffic	Allows staged development and opening of new units without conflict with existing Blue Dolphin or construction traffic	Allows staged development and opening

Source: Table 5, Transport ands Traffic Impact Study, ARUP, 1 November 2006.

Internal roads and access

ARUP confirms that the roads in the site will be *'private roads available and designated for public vehicular and pedestrian use (excluding boat and trailer) use.'* However, public boat and trailer access to the jetty is not to be provided and is expressly precluded in the Community Management Statement.

ARUP advise that the internal road layout will provide *'short sections to deter excessive speeds and to minimise through traffic volumes'*. In addition, ARUP confirms that the '*internal service areas and parking areas are designed to accommodate the Australian Standard trucks and cars, and are located to minimise through traffic for patrons, residents, visitors and service operators. Garbage vehicles can be accommodated on the roads and service areas within the development'*.

The internal service areas and parking areas have been located to minimise through traffic for patrons, residents, visitors and service operators, while pedestrians pathways in the site have been improved and provided along the main routes. In terms of pathways on the site, ARUP confirms that they will be provided along the main routes, whilst the road environment will be designed for low speed traffic movement, which will allow shared use by motorists, cyclists and pedestrians.

Yamba Road Layout

The proposal includes the provision of a raised concrete median being constructed along the centre line of Yamba Road to prevent right turns. ARUP anticipates that this will improve safety and reliability of traffic flow beyond that provided by the existing situation. In addition, the median strips will provide *'safe staged pedestrian and cyclist crossing points'* which are not presently available on Yamba Road. ARUP acknowledge that *"whilst there is likely to be some initial concern from these other road users, many of them have already reported their concerns about delays and danger in making right turns too and from their properties as Yamba Road has become busier"*.

In the short term ARUP propose the following:

- *"2.8m acceleration/deceleration auxiliary lanes eastbound*
- *5.5m bike/parking /traffic lane where occasional parking eastbound*
- *1.2m raised median*
- *5.5m bike/parking /traffic lane where occasional parking westbound*
- *Total width of roadway kerb to kerb: 12.8 -12.9m as existing, plus at the 2.8m auxiliary lanes to a total of 15.6m."*

In the long term, ARUP propose the following:

- *"2.8m acceleration/deceleration auxiliary lanes eastbound*
- *2.8m kerbside traffic lane eastbound*
- *3.0m central traffic lane eastbound*
- *1.2m raised median*
- *3.0m central traffic lane westbound*
- *2.8m kerbside traffic lane westbound*
- *Total width of roadway kerb to kerb: 12.8 -12.9m as existing, plus at the 2.8m auxiliary*
- *lanes to a total of 15.6m.*

A 2.5m wide shared bicycle and pedestrian path is proposed across the site frontage."

Traffic Generation

The TTIS anticipates that the western and eastern access will generate between 200-290 vehicles per day each (based on Stage 1 & 2), which is significantly less than the traffic generation of the existing development during peak periods. The report asserts that *'the deletion of the service station, fuel sales, and general store and roadside café will have*

a significant effect in reducing the numbers of vehicle movements in and out of the site.' In addition, through the establishment of a Dolphin Blue Green Travel Plan, residents, patrons and staff will be encouraged to make more sustainable transport choices.

Intersection Capacity

In terms of the accesses to the site, the western access has been designed to the standard and appearance of a public road, whilst the residential driveway has been designed to the standards and appearance of a residential driveway. ARUP confirm in their report that '*both accesses are capable of accommodating Medium Rigid Vehicle (MRV) garbage trucks and occasional Large Rigid Vehicle (LRV) trucks and tourist buses'*. In addition, the report states that *'the capacity of driveways acting as priority intersections is determined by the through traffic headways along Yamba Road and the follow-up headways on the site access driveways. Analysis using the SIDRA model indicates acceptable levels of service at both driveway intersections in the peak holiday hours traffic as estimated above and shown in the table below. The analysis indicates that the driveways will operate at a good level of service without the need to use the shoulder lane or separate left turn lanes, although these are proposed in accordance with AUSTROADS Part 5 standards.'*

Table 7.2 Access Levels

Eastern driveway Configuration	**Maximum Delay (on left turn out) (seconds)**	**Queue (metres)**	**Level of Service**
2 lane Yamba Road with no use of shoulder lanes	10.3	7	LOS B (good)
2 lane Yamba Road with occasional use of shoulder lanes as 50m short lanes on approach to the intersection.	9.9	7	LOS A (excellent)

Source: Table 8, Transport and Traffic Impact Study, ARUP, 1 November 2006.

Parking

The development includes the provision of 612 car parking spaces, which will be located at basement level, in undercroft parking and on ground level (for Villas). 102 visitor parking spaces will be provided on the site.

ARUP advises that parking provision is based on the RTA Guide to Traffic Generating Developments 2002 requirements. The RTA recommends the provision of one space per dwelling but preferably two and one visitor car parking bay per five residential units or part thereof. The breakdown of the spaces to be provided are set out in table 7.3 below:

Table 7.3

Parking	Western Site Holiday	Eastern Site Residential	Total Site
Proposed Dwelling units	117	224	341
Required Parking bays @ 50:50 split of 1and 2 bays per unit	179	336	515
Required Visitor parking bays @ 1 bay per 5 units	24	45	69
Required total car parking bays	203	381	584
Proposed car parking bays	212	400	612
Proposed on-grade visitor parking spaces	50	52	102
Total proposed car parking	262	452	714

Source: Table 9, Transport and Traffic Impact Assessment, ARUP , 1 November 2006.

Although the provision of over and above that required, ARUP conclude that the over provision will *'balance the loss of onstreet car parking on the Yamba Road frontage resulting from the acceleration and deceleration lanes.*

Parking provision also complies with the Clarence Valley DCP for parking (this is confirmed in the Residential DCP Compliance table at Appendix 19).

The parking space sizes are based on Australian Standard AS2890.1:2004 and comply with these requirements, whilst bike parking is based on and is in accordance with AUSTROADS Guidelines.

ARUP have concluded that there will be adequate servicing, turning and parking for trucks and couriers in accordance with AS 2890.2. Off Street Commercial Vehicle Facilities.

ARUP conclude that as a result of the development, safety will be improved by:

- Reducing the right turn conflict points long Yamba Road;
- The provision of a low speed design environment;
- Provision of pedestrians/bicycle path along site frontage;

- Provision of pedestrian refuges on Yamba Road;

- Provision of road network improvements including the Yamba Road median and roundabout at Shores Drive/Yamba Road.

ARUP recommends the following:

• *"Routes are overlooked and have active street frontages, enabling visual surveillance by residents.*
• *Pram/ wheelchair crossing points are required at road intersections*
• *Safe crossing points should be provided for pedestrians at appropriate locations, particularly along collector roads*
• *Shared pathways should be between 2 – 2.5m wide, preferably 2.5m.*
• *Footways widths should be 2m, although they can be reduced to 1.2m for short distances to avoid obstructions. Footways serving non-residential uses may need to be widened within the immediate vicinity of developments to accommodate the increased pedestrian flow.*
• *Any landscaping should not reduce visibility along shared pathways*
• *Lighting levels along shared pathways should be adequate, in particular at intersections with roads and obstructions, such as street furniture*
• *Bicycle parking is provided in accordance with AUSTROADS guidelines.*
• *On shared pathways there should be adequate site distance to minimise conflict between users. The minimum stopping distance for cyclists, when there is no gradient is approximately 15m for cyclists travelling at 15 km/hr."*

7.2.3 Conclusion and Mitigation Measures

ARUP conclude that the proposed development will improve safety by:

- *"Reduction of right turn conflict points along Yamba Road*

- *Low speed design environment*

- *Pedestrians/bicycle path along site frontage*

- *Pedestrian refuges on Yamba road*

- *Road network improvements including the Yamba Road median and roundabout at Shores Drive/Yamba Road."*

Importantly, ARUP concludes that the traffic generation will not be any more than existing – this is further addressed in Section 7.2 of the EA.

The TTIA concluded that the proposal will generate significantly less traffic than the traffic generated from the existing development during peak periods. Adequate parking and access for service vehicles will be provided for both the tourist and residential accommodation. In addition, it was concluded that left in/left out only traffic access driveways were the best design option as they

…avoid the immediate 4-lane road widening of Yamba Road which was rejected by community responses to the Strategic Road Study. They minimise the noise of speed changes and headlight beam deviation into residences which would occur with roundabouts. The operation of the proposed accesses was tested using the SIDRA intersection program for the peak holiday mode i.e. Christmas and off peak. The access intersections with Yamba Road both operated at level of service LOS B (Good) or better."

ARUP conclude that the overall transport environment would be improved as part of the development by:

- *"Funding and construction of a raised central median on Yamba Road and a contribution to a roundabout at the intersection of Yamba Road and Shores Drive to create the leftin/ left-out traffic flow with right turn recirculation via roundabouts. This traffic flow arrangement is considered safer and more efficient and is advocated by the RTA.*

- *Funding by the proponent should be commensurate with the need for changed local transport demand along the site frontage such as the concrete median and site access roads, and a partial contribution in proportion to the use towards the wider area improvements which benefit the whole network, such as the new roundabout. Traffic generation from the subject site will not be any more than existing.*

- *An off-road shared bike and pedestrian path along the Yamba Road frontage of the site to provide an additional choice for cyclists and walkers.*

- *Improvement of the existing bus stops and shelters on both sides of the Yamba Road frontage, with all –weather paving and inverted U rail bike parking to encourage use of public transport.*

- *Installation of pedestrian refuges in the proposed central median in Yamba Road including near the bus stops to improve the safety of the pedestrians, and bus travellers, and local residents wanting to cross Yamba Road.*

- *Establishment of a Dolphin Blue "Green Travel Plan" within the development to encourage residents, patrons and staff to make sustainable transport choices".*

There are many benefits associated with this development, however in order to ensure this is maintained, the Green travel Plan will need to be implemented and monitored.

7.3 Flooding

7.3.1 Existing environment

The site adjoins the southern foreshores of the Clarence River, approximately 2km from the opening of the Clarence River to the Pacific Ocean. For this reason, the site is subject to flooding due to the effects of the Clarence River peak flows coinciding with tidal surges.

Existing floor levels on the site vary between RL 2.4 and 2.7m approximately.

A Report on Sustainable Water Management has been prepared by ACOR (Appendix 19). The Report defines the variation over time of flood levels, extent and velocity for flood events of various severities, up to and including the PMF.

Figures 1-8 in Appendix C of the Report on Sustainable Water Management indicate the 1:5, 1:20, 1:100 and PMF floods over the site:

- *At 0.90-1.00m AHD, the 1:5 Flood with velocity <0.10m/s affects a small portion of the site, along the north-western corner;*

- *At 1.80-1.90m AHD, the 1:20 Flood with velocity <0.10m/s affects the majority of the site, with the exception of two small areas along Yamba Road;*

- *At 2.30-2.40m AHD, the 1:100 Flood with velocity <0.10m/s affects the entire site; and*

- *At 3.30-3.60m AHD, the PMF Flood with velocity 0.10-0.20m/s affects the entire site.*

7.3.2 Potential Impacts

Whilst the existing site is subject to flooding due to the effects of the Clarence River peak flows coinciding with a tidal surge, the Report on Sustainable Water Management provides:

> *The site does not flood due to local catchment flows*.

However, redevelopment has the potential to impact upon flood behaviour (levels, flows and flowpaths) and therefore the flood exposure of other properties. Impacts can be due to:

- Blocking by fill of, or buildings on, floodways;

- Removing area for flood storage within the floodplain, due to filling or levees; and

- Increasing the amount of impervious area in a catchment which, without appropriate management, increases the overall volume and peak runoff from the area.

ACOR have liaised with Council in relation the impact of flooding on the proposed redevelopment and have concluded that *"the development has been designed to set all floor levels at or above the flood planning level provided by council, i.e. 2.7m AHD. Building basements are to be effectively "flood proofed" by raising entry levels to at least RL 2.7m AHD around all building entries. The development will effectively act as a levee along the Clarence River estuary boundary which will reduce the negative effects of flooding on the development itself and the surrounding residential areas immediately to the south of the development by slowing the inundation of flood waters to these areas"*.

The NSW Floodplain Development Manual (FDM) was prepared by the Department of Infrastructure Planning and Natural Resources in 2005 with the primary objective *'to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods'*.

The FDM acknowledges a broad risk management hierarchy of:

- *avoidance of flood risk;*
- *minimisation of flood risk; and*
- *flood risk mitigation.*

In relation to the FDM, the Report provides:

> *During a flood event water will rise and fall from the estuary. The development will not impede flood flows but will reduce available flood storage volumes. Due to the significant area of the extent of flooding within the flood plain and the proximity to the ocean the effect of reduced flood storage will be insignificant. As such loss of flood plain storage due to the development is not a concern.*

Clause 11(2) of the Mclean LEP 2001 provides:

> *Consent must not be granted to the erection of a dwelling on flood liable land unless the floor level of the living accommodation of the dwelling is located:*
>
> *a) in the case of land within Zone No 2 (a), 2 (b), 2 (t), 3 (a) or 4 (a) that is within the town of Iluka or Yamba, at least 0.3 metre above the 1 in 100 year flood level adopted by the Council.*

The 1 in 100 year AEP flood event level for the site is in the range of 2.3 to 2.4m AHD. Minimum floor levels have been set at as RL 2.7m. and therefore comply with the requirements of Clause 11(2). This allows for a freeboard of 360mm above the 1 in 100 year ARI flood level. Building basements are to be effectively "flood proofed" by raising entry levels to at least RL 2.7m AHD around all building entries.

In relation to the extent of the flood hazard:

> *…the development is located within an area designated as low velocity. Velocity has been predicted as 0.1m/s. Depths of flooding will vary from 0 to 800 maximum. As such the velocity depth product will be in the range of 0 to 0.1m.m.s and hence the flood hazard is considered to be classified as low.*

The impact of the proposal including the cumulative effect of the Yamba bypass on flooding has also been assessed. The Report concludes:

> *…that the filling of the Blue Dolphin Caravan Park Site independently had a non worsening effect of flood levels, based on the 100 year and 20 year ARI*

modelling results. Similarly, results show the combined filling of the Blue Dolphin Caravan Park with the neighbouring development in West Yamba reduces the minor impacts resulting from West Yamba development.

7.3.3 Conclusion and Mitigation Measures

Clarence Valley Council currently have in place a flood warning plan for the Clarence Valley that warns residents of the ensuing flood as it travels from the upper reaches of the Clarence towards the site. In addition to this existing mitigation measure, the Report recommends:

- *a site evacuation plan in the event of flooding is incorporated into the Community Management Statement that coordinates with councils flood warning plan to ensure residents of this development are fully warned of ensuing rising of flood waters.*

7.4 Water and Soils

7.4.1 Clarence Estuary Management Plan

The aim of the Clarence Estuary Management Plan is:

> *To achieve a healthy, productive and attractive Clarence estuary where resources are used on a sustainable basis in harmony with environmental values, community and visitor needs.*

The Estuary Management Plan (see **Figure 13** for plan detailing physical extent of the Management Plan) includes actions to address four major issues. These issues are noted below. It is noted that the processes and condition of the coastal floodplain and estuary are closely interdependent, so there is considerable overlap between aspects of all issues.

1) Integrated Water Cycle Management;

2) Threats to Ecological Values;

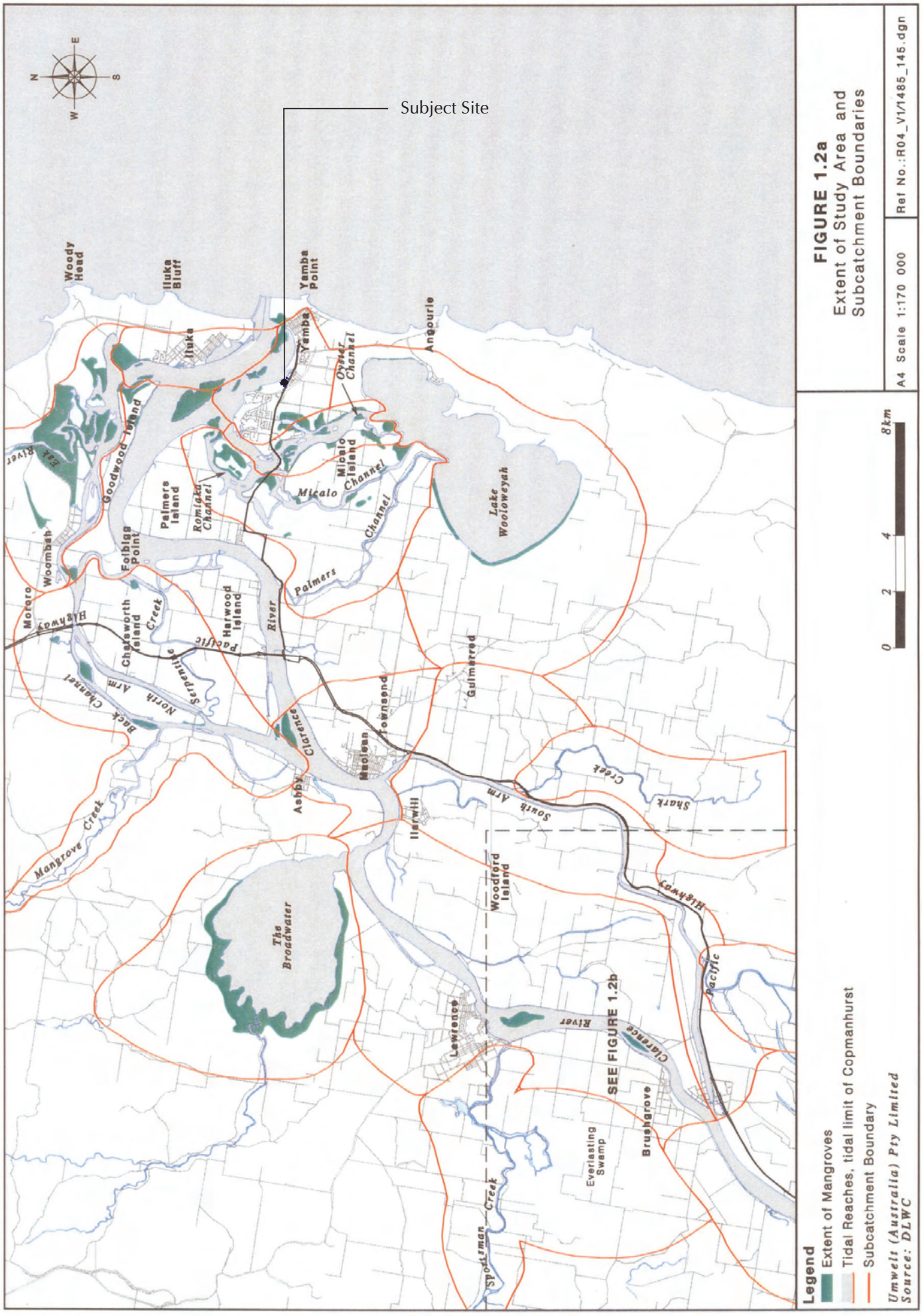
3) User Interactions; and

4) Overcoming Uncertainty and Facilitating Systemic Management.

The above four issues have been addressed generally in the Report on Sustainable Water Management (Appendix 18), Flora Assessment (Appendix 10) and Fauna Assessment (Appendix 11). The following key outcomes are upheld by the proposal:

- Integrated management of water supply, stormwater and wastewater;

- Tidal flows are maintained;



Dolphin Blue Redevelopment Concept Plan, Yamba

Source: Umwelt (Australia) Pty Limited

CLARENCE ESTUARY MANAGEMENT PLAN

0 5 km

prepared by **planning workshop australia**
2061154\graphics\ds-fig.cdr
Issued 7 Nov 06

Fig 13

- Threats of contamination of groundwater are minimised; and

- The risks of flooding to infrastructure and property are minimised.

7.4.2 Acid Sulphate Soils

7.4.2.1 Existing environment

The Department of Land and Water conservation 1:25, 000 Acid Sulphate Soil Risk Map of Yamba shows that the site is located in an area of disturbed terrain and indicates that investigations for acid sulphate soils are required. As discussed at Section 7.4, Coffey Geotechnics investigated the potential for acid sulphate soils:

> *Based on the results of the laboratory testing, samples from the Unit 2a and 2b marine soils exceeded the action criteria for both %SCR and TPA. In accordance with the Acid Sulphate Soil Manual (1998), an acid sulphate soils management plan is required for the development where soils exceed the action criteria.*

7.4.2.2 Potential Impacts.

Acid Sulphate Soils (ASS) are soils which contain significant concentrations of pyrite which, when exposed to oxygen, in the presence of sufficient moisture, oxidises, resulting in the generation of sulphuric acid. Unoxidised pyritic soils are referred to as potential ASS (PASS). If the soils are exposed, the oxidation of pyrite occurs and sulphuric acids are generated, the soils are said to be actual ASS (AASS).

A preliminary Acid Sulphate Soil Management Plan has been prepared by Coffey Geotechnics and is attached at Appendix C of the Geotech Report (Appendix 12).

7.4.2.3 Conclusion and Mitigation Measures

The NSW ASSMAC "Acid Sulfate Soil Manual" (August 1998) suggests that for an extensive development on a site greater than 4ha in area, two investigation holes per hectare would be required to provide adequate site coverage. On this basis, the Geotechnical Assessment provides:

> *…sampling and testing in up to about eight additional boreholes is recommended prior to construction.*
>
> *The number and depth of additional boreholes should be assessed by an experienced consultant based on the proposed area and depth of soil disturbance at the site.*
>
> *The depth of the additional investigations should be at least 1m beyond the proposed depth of excavation or depth of groundwater drawdown, or at least 2m below the ground surface, whichever is greater. Soil samples should be collected every 0.5m.*

All samples taken during the investigation should be screened for the presence of potential ASS using laboratory methods 21Af and 21Bf of Ahern CR, Blunden B and Stone Y (eds) (1998), Acid Sulfate Soil Laboratory Methods Guidelines, ASSMAC. The results of the screening tests should be assessed by an experienced consultant, and POCAS, SPOCAS or CRS tests carried out as considered appropriate.

The results of the additional investigation work should be assessed, and a final acid sulphate soil management plan prepared for the development.

7.4.3 Dewatering

Coffey Geotechnics undertook a field assessment to assess local groundwater levels, groundwater quality, depth of aquifer and soil characteristics. This involved:

- *Drilling of eight bore holes to varying depths across the site (Figure 2 in the Dewatering Management Statement shows the investigation locations);*
- *Collection of soil data;*
- *Groundwater level measurement with data loggers and sampling; and*
- *Hydraulic testing at each piezometer*

The drilling results indicate that the site is underlain by sand:

Bedrock was not observed in any of the boreholes. No soft to firm clay layers were observed during drilling which, if present, can dramatically increase settlements.

Measured groundwater levels during the field investigation varied from 0.3mAHD to 0.6mAHD.

Coffey Geotechnics prepared a Dewatering Management Statement (Appendix 20) which considered the presence of acid sulphate soils (ASS); and a groundwater assessment of:

- *Inflow rates into basement excavations (underground car parking);*
- *Treatment of groundwater from excavations prior to discharge;*
- *Potential for groundwater drawdown from dewatering of excavations and the possibility of settlement to nearby structures; and*
- *The possible need for the reinjection of groundwater to control groundwater drawdown effects.*

7.4.3.1 Potential Impacts

In the following discussions, construction dewatering requirements have been considered in the absence of groundwater drawdown mitigation measures in assessing impacts on the groundwater system and local groundwater users.

This provides a basis for appraisal of the potential significance of the concept plan in relation to groundwater, and serves to confirm that mitigation measures would be required as part of groundwater control during the construction process. The analysis also provides a basis for assessment of the level of control required to manage groundwater impacts during construction.

The proposed basement levels are between RL0.5m AHD and RL-0.5mAHD.

Data from the NSW Department of Public Works (1964) on tidal gradient within the Yamba area indicates spring tides up to about RL1.5AHD can be expected at the site.

The Dewatering Assessment provides:

> *During construction, it is anticipated that drawdown to a level of -1.5m AHD to -0.5m AHD will be required to achieve workable conditions within the construction excavation site and to allow excavation to sufficient depth for the bulk of construction activity. Localised dewatering will also be required to about 1m to 1.5m below the basement levels for lift pit construction.*

As discussed earlier, measured groundwater levels during the field program varied from 0.3mAHD to 0.6mAHD, indicating that a groundwater drawdown of approximately 1.5m to 2m will be required to support construction activities.

The Assessment provides:

> *Groundwater drawdown due to dewatering can lead to settlement of houses and other structures near the site during construction. The volume and quality of groundwater extracted needs to be considered to assess disposal options for the water.*

The Assessment concludes:

> *In the absence of mitigation measures, drawdown and settlement would potentially impact an area within 200m of the site boundary. It is assessed that groundwater impacts in the absence of mitigation measures may be unacceptable and therefore it is recommended that mitigation measures be established as a contingency to control groundwater level reduction outside the site boundary.*

7.4.3.2 Conclusion and Mitigation Measures

The extent and sequencing of construction works is a relevant consideration in the assessment of dewatering impacts. For work carried out progressively with individual dewatering operations for each structure the drawdown impacts would be significantly less than if the entire site were to be dewatered during the complete construction program. Coffey recommend dewatering be carried for individual construction areas as required and the assessment of groundwater inflows and drawdown impacts is carried out on this basis.

The following groundwater management and control measures are recommended by the Assessment:

- *Geotechnical assessment of structures potentially affected by settlement prior to dewatering;*
- *Groundwater injection along the site boundary;*
- *Curtain walls around excavation with re-injection of groundwater outside of the curtain wall;*
- *Settlement monitoring; and*
- *Groundwater monitoring.*

Design of groundwater control measures would need to be carried out in conjunction with the design of basement excavation shoring.

- *Design of dewatering system integrated with basement/foundation excavation and construction be undertaken as part of the detailed design;*
- *Continuous monitoring of groundwater levels be undertaken in the on-site piezometers up to the beginning of construction works (collected data from the data loggers should be analysed to assess the response of the groundwater table over time, particularly with respect to rainfall); and*
- *A groundwater monitoring plan be developed for the construction phase this would include:*

- *monitoring of onsite piezometers;*
- *installation and monitoring of additional off-site piezometers to track dewatering impacts;*
- *monitoring of dewatering volumes and water quality; and*

- *establishment and regular monitoring of settlement at the site boundary and at various points beyond the site boundary to provide a basis of assessment of settlement impacts and allow timely intervention if needed.*

In terms of reducing groundwater inflows, the Report states that:

> *Coffey is aware that the rainforest located to the north-west of the site will be sensitive to groundwater drawdown. To reduce the potential impacts of groundwater drawdown, mitigation measures including groundwater monitoring and re-injection along the north-western site boundary will likely be required. On the basis of our understanding of the conditions evident at the site, it is considered that a scheme of re-injection possibly involving absorption trenches and/or wells can be developed to effectively reduce the effects of groundwater drawdown outside the site boundaries. The effects of the scheme would be to increase the groundwater turnover through the dewatering system, which would have to be taken into account in system design. The scheme would also ideally involve dewatering and potentially trialling recharge systems at locations on the site sufficiently away from the rainforest area, thus allowing consideration of the effects prior to dewatering within the more sensitive areas. Monitoring would need to provide real-time measurement of drawdown during dewatering, thus allowing changes to the process to be adopted during the works.*

Given the mitigation measures proposed by Coffeys above, the proposed use of ground water re-injection will help to reduce the impacts of dewatering on the site and indeed the surrounding areas.

7.4.4 Geotechnical

7.4.4.1 Existing Environment

The site is situated within a flat alluvial floodplain of the Clarence River. The Maclean 1:250,000 Geological Series Sheet produced by the Geological Survey of NSW confirms the site is underlain by Quaternary aged sediments. Locally, the ground surface is generally flat.

Coffey Geotechnics conducted a Phase 1 Geotechnical Assessment **(Appendix 12).** Field work involved the drilling of eight boreholes (BH1 to BH8) across the site. The depths drilled ranged from 6m to 25 m. The Assessment provides:

> *The levels of the groundwater indicated in Table 4* [of the Assessment] *indicate the groundwater flows in a north-east direction towards the Clarence River.*

Environmental and geotechnical samples were taken from the boreholes for laboratory testing (particle size distribution tests and groundwater aggressivity tests).

In relation to the local geology, the Assessment provides:

> *This area is located near the river mouth of the Clarence River which comprises deep sedimentary deposits of sands, silts and clays. Based on our previous experience in the low lying areas of the township of Yamba, a shallow band of*

indurated (or weakly cemented) sand has been encountered at a number of the sites investigated.

A search of DLWA groundwater bore data in the area shows that the area comprises mainly sand with some clay lenses..

7.4.4.2 Potential Impacts

Table 5 of the Geotechnical Assessment provides a geotechnical model based on subsurface investigations. Where footing loads are higher than can be supported by shallow footings, or settlements under shallow footings are excessive, pile foundations could be adopted. The following options were considered appropriate for founding conditions and parameters:

- *Shallow footings founded within the Unit 2a loose to medium dense Sand and Silty Sand materials which are encountered up to 4m depth;*
- *Pile foundations within the Unit 2a, Unit 2b and/or Unit 2c sands;*
- *A combination of shallow footings and pile foundations.*

It is considered that open bored piles would not be practical at the site as pile hole support and dewatering of the base of the piles would be needed prior to pouring concrete.

Preliminary design parameters for the relevant geotechnical units are provided at Sections 5.3, Shallow Footings and Section 5.4, Pile Foundations of the Geotechnical Assessment.

Groundwater was encountered between 0.8m and 1.0m depth below ground surface. The Assessment provides:

As the site soils within the depth of the proposed excavation and to a depth of about 45m below the ground surface comprised mainly sand and silty sand, groundwater inflows into excavations could be significant if adequate measures are not taken to address the issue.

Excavations of up to 2m to 3m are proposed for basement car parking facilities. Basement carparks will be designed to withstand hydrostatic pressures on the base of the concrete slabs during times of high groundwater and/or flood conditions.

The proposal also incorporates a number of man made ponds and water features. The Assessment provides:

Due to the relatively high permeability of the underlying soils, these ponds will need to be lined to enable water retention. However, in making the ponds watertight, unless mitigation measures are adopted in the design, the underside of the liner will be subjected to hydrostatic water (uplift) pressures in the event of

groundwater level rise. This could result in the pond liners lifting, and potentially being damaged, depending on the materials used in their construction.

7.4.4.3 Conclusion and Mitigation Measures

The Assessment provides that soil profiles encountered at the site could be readily excavated by conventional earthmoving equipment such as backholes and excavators.

Basement carparking areas will be designed as fully tanked structures, with a tanked access ramp that extends over a local levee system providing access. The levee system will be higher than the design flood level for the site.

The Assessment provides:

> *The basement structures will need to be effectively 'tied down' such that uplift cannot occur. This could be achieved by using the dead weight of the structure and/or pile foundations capable of carrying tension loads.*
> *The design of tension piles will require consideration of two potential failure mechanisms. These include a failure by slip along the shaft of the pile ('shaft adhesion failure') and a 'cone pullout failure' mechanism.*

The following general comments and recommendations are provided for site preparation beneath structures:

- *Following excavation to design level, the exposed natural in-situ materials should be proof rolled to identify any wet, excessively deflecting or other deleterious material. Any such areas should be over-excavated and backfilled with a clean select material. All topsoil should be stripped and stockpiled for re-use as landscaping materials only;*

- *Approved fill beneath roads should be placed in layers not exceeding 300mm loose thickness and be compacted to a minimum density index of 65%;*

- *The top 300mm of natural subgrade or subgrade fill below pavements should be compacted to a minimum density index of 85%;*

- *Approved fill beneath structures should be placed in layers not exceeding 300mm loose thickness and be compacted to a minimum density index of 70%. All filling beneath structures should be carried out under Level 1 construction monitoring and testing as defined in AS3798-1996;*

- *Earthworks should be carried out in accordance with the recommendations in AS3798-1996, 'Guidelines for Earthworks for Commercial and Residential Developments'.*

Basement carparking areas will be designed as fully tanked structures, with a tanked access ramp that extends over a local levee system providing access. The levee system will be higher than the design flood level for the site.

Preliminary design parameters for the relevant geotechnical units are provided at Sections 5.3, Shallow Footings and Section 5.4, Pile Foundations of the Geotechnical Assessment.

The investigation for aggressivity to buried structural elements was assessed as:

- *'Mild', for concrete piles, in accordance with Table 6.1 of the AS2159-1995 Piling-Design; and*

- *'Non Aggressive' for steel piles, in accordance with Table 6.3 of the AS2159-1995 Piling-Design.*

…based on the subsurface conditions at the site, and the close proximity of the site to the Clarence River it would be expected that the marine sand units could be affected by saline water. On this basis we suggest that the concrete and steel piles be designed for a minimum of a 'moderate' exposure classification.

In relation to pond liner and the potential for groundwater rise:

Options for the liners could include reinforced concrete, clay or a form of synthetic low permeability barrier such as HDPE liner.

Options for reducing the risk of hydrostatic uplift and potential damage to the liner include structural solutions such as tie down, or other options such as the incorporation of one-way valves that allow water to flow to the top of the liner as groundwater rises, (therefore equilibrating the pressure top and bottom), but not to flow back once the groundwater level falls.

7.4.5 Mosquito Management

7.4.5.1 Existing Environment

A Mosquito Control Report has been prepared by Woodhead (see Appendix 24). The Report provides:

It is a commonly accepted fact hat during seasonal peaks there is an issue in regards to mosquitos within Yamba and it surrounding NSW North Coast neighbours.

The objective of the Report is

…to identify possible points of difference in the control of mosquitos to aid in the comfort levels of residential and tourist development of this nature.

In general terms mosquito control can be broken down into two main categories:

1. *Control of Overall Mosquito Populations – minimising the overall number of mosquitos on the site through environmental management.*

2. *Control of the mosquitos that are actually present – dealing with mosquitoes that spread from off-site.*

7.4.5.2 Potential Impacts

Waterbodies have been restricted to swimming pools and selected decorative water features.

In order to ensure the optimum levels of comfort to both residents and visitors alike, some form of additional control will be required onsite.

Mosquito population management can be undertaken on a number of levels from biological control through implementing appropriate eco-systems through to control by chemical means.

Effective mosquito management will target the specific life cycles of the mosquito, the larval stage and the adult stage.

7.4.5.3 Conclusion and Mitigation Measures

The Report recommends the basic control of mosquitoes through:

- *Screens;*
- *Traps; and*
- *Repellers.*

Further, the Report provides:

> *Planting to the edges of water features will require particular attention to avoid the provision of suitable breeding areas and the provision of the appropriate species off fauna on the site will greatly enhance the effectiveness of this approach. The water within any feature will be required to be constantly recirculated*

The following is suggested to be incorporate into the Community Management Strategy:

- *Remove all standing water. All mosquitos need water to complete their life cycle.*
- *Get rid of old tires, tin cans, buckets, drums, bottles or any water holding containers.*
- *Fill in or drain any low places (puddles ruts).*

- *Keep drains, ditches and culverts clean of weeds and trash so water will drain properly.*

- *Cover trash containers to keep out rain water.*

- *Repair leaky pipes and outdoor faucets.*

- *Change the water in birdbaths and plant pots or drip trays at least once a week.*

- *Keep grass cut short and shrubbery well trimmed so adult mosquitos will not hide there.*

The report recommends:

> *…specialist advice be obtained in order to develop an appropriate management strategy. Included within this will be a landscape approach that is responsive to this strategy.*

7.5 Riparian Corridor and Public Access

The Yamba Bay Foreshore Reserve was reserved for public recreation in 1910 and included the existing Blue Dolphin Holiday Resort. The majority of the land was converted to freehold in 1972 with the exception of a 20 m wide Crown road along the foreshore. This road was closed in 1995 and was added to Reserve 1003009 for Public Recreation and Coastal Environment Protection on 11 October 2002.

This Foreshore Reserve separates the site from the river. A Flora Assessment (see Appendix 10) concluded that the vegetation of the Yamba Bay Foreshore Reserve adjoining Yamba Bay consisted predominantly of open grassed areas, concrete paths and scattered trees. It is recommended that monitoring and careful management is required during the construction period to minimise the risk to the vegetation of the adjoining Nature Reserve.

In terms of the impact on Fauna, the Fauna Assessment (see Appendix 11) concluded that

> *The Clarence Estuary Nature Reserve is part of a fragmented wildlife corridor that extends along the southern bank of the Clarence River and then extends southwards to undeveloped land and Yuraygir National Park. The subject site has been largely cleared of its native vegetation and is not part of this corridor (Figure 6).*
>
> *The mature trees along the eastern boundary of the subject site (i.e. along the river front) has limited value in assisting fauna to move through the subject site because the trees do not have a continuous canopy, they are used by Noisy Miners which chase other fauna species out of the trees, and they do not form a link between the Clarence Estuary Nature Reserve and other remnant habitat in the locality.*

Given the conclusions of both the Flora and Fauna Assessment, it is likely that the proposal will have a negligible impact on the adjacent foreshore providing that the Reserve is monitored and careful managed during construction.

7.6 Natural Heritage

7.6.1 Fauna

7.6.1.1 Existing Environment

A Fauna Assessment has been prepared by Ambrose Ecological Services (Ambecol) (Appendix 11). In relation to the existing environment, the Assessment provides:

Three trees (2 mature Melaleuca trees towards the western end of the northern boundary and 1 Banksia at the centre of the northern boundary) were observed with hollows large enough to be used as roosting and breeding habitat and shelter by microchiropteran bats, hollow dependent birds, some aboreal mammals and reptiles:

> *The scarcity of tree hollows on the subject site is due largely to past habitat clearance and removal of some limbs and branches from existing trees on the site that had structural defects.*

Further, the Assessment provides:

> *The highly modified nature of the landscape of the subject site means that it has limited value as habitat for native fauna other than species that are tolerant of urban landscapes. This is despite the close proximity of the subject site to conservation reserves.*

Ambrose Ecological Services, also indicated that:

> *The mature trees along the eastern boundary of the site (ie along the river front) has limited value in assisting fauna to move through the subject site because the trees do not have a continuous canopy, they are used by Noise Miners which chase other fauna species out of the trees, and they do not form a link between the Clarence Estuary Nature Reserve and other remnant habitat in the locality.*

Notwithstanding the above, 30 fauna species were recorded during a field survey, undertaken on the 26-27 October 2006:

> *Three threatened bat species, the Grey-headed Flying-fox, East Coast Freetail-bat and Eastern Bentwing-bat have been recorded on the subject site.*
>
> *Potential habitat also occurs for the following threatened species: Osprey, Hoary Wattle Bat, Little Bentwing-bat, Large-footed Mouse-eared Bat and Greater Broad-nosed Bat.*

7.6.1.2 Potential Impacts

Potential fauna impacts relating to the proposal were identified by reviewing relevant literature and databases and conducting field surveys. The databases searched include:

- *NPWS Wildlife Atlas Database*
- *NSW Field Ornithologists' Club Atlas Database;*
- *Birds Australia Atlas Database (1977-81) and (1998 onwards);*
- *EPBC database; and*
- *Australian Museum specimen collection databse.*

The conservation value of fauna habitats on the site was determined by reference to the following criteria:

- *Representativeness – whether the vegetation communities of the site are unique, typical or common in the boregion;*
- *The presence of threatened or regionally significant species on the site;*
- *The extent of human influence on the natural values of the site;*
- *The amount of native vegetation to be cleared or modified by the proposed development in relation to what remnant vegetation will remain in the locality; and*
- *The relative importance of a site as a corridor for the movement of wildlife.*

7.6.1.3 Conclusion and Mitigation Measures

The Assessment concludes that the proposed development is unlikely to impact on fauna habitats in the Clarence Estuary Nature Reserve or adjoining areas of the Clarence Estuary provided that the recommendations listed in Section 4.3 of the present report are implemented. These are:

- ***If possible, retain the three hollow-bearing trees on the subject site.*** *If these trees are to be removed or significantly pruned, then at least six nest boxes that are suitable for use by microchiropteran bats (see Appendix C) should be placed in mature trees that are to be retained.*
- ***Silt fences and sediment ponds should be appropriately placed around construction areas on the subject site*** *to prevent runoff of sediment and nutrient-enriched waters into the Clarence Estuary Nature Reserve and the Clarence Estuary. The effectiveness of these traps should be closely monitored during construction, ensuring that treated site run-off meets EPA guidelines.*
- ***Trees and other vegetation that are to be removed from the subject site for the proposed development should be conducted with minimal disturbance to the soil.***
- ***If trees or bushes have to be cleared from the subject site, they should be checked for the presence of active nests of birds (that is, those nests containing fertile eggs or nestlings) and arboreal mammals (such as possums).*** *These plants should not be*

removed or pruned until animals that are nesting in them have completed their breeding cycle.

- ***Trees or bushes that are cleared or pruned should be checked for animals before and after felling or pruning****. Injured animals should be taken to a local vet or the local wildlife rescue service should be notified.*

- ***Construction wastes will require appropriate management to prevent accidental discharge of chemicals, truck washings or other pollutants into waterways and vegetation on the subject site and in the Clarence Estuary Nature Reserve.***

- ***Display an interpretative sign on the subject site,*** *preferably near the waterfront, which depicts the importance of the Clarence Estuary as habitat for shorebirds and other marine species.*

- ***Restrict the ownership of dogs and cats in the proposed development and other future developments along the Clarence River, and ban the walking of dogs along the river foreshore.*** *This will help minimise disturbance and possible mortality of shorebirds.*

- ***Discourage people from collecting crustaceans, molluscs and other benthic fauna from the mudflats adjacent to the subject site.*** *This would help ensure that there are adequate food supplies for shorebirds that forage on the mudflats and minimise human disturbance to these birds.*

7.6.2 Flora

7.6.2.1 Existing Environment

A Flora Assessment has been prepared by Anne Clements and Associates (**Appendix 10**).

The Blue Dolphin Holiday Resort, Yamba Bay Foreshore Reserve and the north-eastern corner of the Clarence Estuary Nature Reserve was surveyed by Dr Anne Marie Clements and Polly Simmonds on 26 and 27 October 2006.

From the historical aerial photographs, the eastern half of the Site was cleared prior to 1971, with further clearing and development of the Holiday Resort over each decade. Prior to clearing the vegetation appears to have been similar to that in the Clarence Estuary Nature Reserve.

The Blue Dolphin Holiday Resort in October 2006 consisted of numerous occupied holiday units, cabins, tent and caravan sites, swimming pools, children's playgrounds, petrol station, tennis court, an extensive network of concrete vehicle and pedestrian access ways, mown lawns, landscaped garden beds and shade trees.

From the tree survey by David Kay in 2006, there were 1712 shrubs and trees identified on the Site with:

Height	Number of individuals	Native	Exotic
10 to 15m	145	127	18
> 5 m and < 10 m	488	124	364, with 352 palms
< 5 m	1079	1043	36
Total	**1712**		

The vegetation of the Yamba Bay Foreshore Reserve adjoining Yamba Bay consisted predominantly of open grassed areas, concrete paths and scattered trees.

The vegetation of the Clarence Estuary Nature Reserve was a mosaic of tidal creeks with mangroves, Melaleuca quinquenervia dominated swamp forest and Littoral Rainforest.

The cut drainage line from Yamba Road to Yamba Bay has been colonised by Avicennia marina var. australasica (Grey Mangrove) in the tidally inundated areas.

From the flora assessment of the Site, it was found that:

- A total of 103 species (59 native, 44 exotic) were recorded (Table 2) from three Transects and two Quadrats (all 400 m2 in area) and one Spot locations on the Site and one Transect (Transect 2) and one Spot location in the adjoining Clarence Estuary Nature Reserve.
- No Commonwealth listed endangered ecological communities under the Environment Protection and Biodiversity Conservation Act 1999 within10 km radius from the Site are known to occur within a 10 km radius of the Site;
- No State listed endangered ecological communities occur on the Blue Dolphin Holiday Resort nor the Yamba Bay Foreshore Reserve. Two endangered ecological communities (Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions; and Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions) under NSW Threatened Species Conservation Act 1995 are likely to be present in the Clarence Estuary Nature Reserve;
- No Commonwealth listed plant species under the Environment Protection and Biodiversity Conservation Act 1999 were recorded nor are likely to occur on the Blue Dolphin Holiday Resort nor the Yamba Bay Foreshore Reserve. Three threatened species (Acronychia littoralis, Cryptocarya foetida and Phaius australis) may possibly occur in the Clarence Estuary Nature Reserve.
- No State listed species under NSW Threatened Species Conservation Act 1995 were recorded nor likely to occur on the Blue Dolphin Holiday Resort nor the Yamba Bay Foreshore Reserve. Four threatened species (Acronychia littoralis, Phaius australis, Phaius tankarvilleae and Sophorea tomentosa) may possibly occur in the Clarence Estuary Nature Reserve.
- Four of the 44 exotic species recorded (Asparagus asparagoides, Chrysanthemoides monilifera subsp. monilifera, Lantana camara and Ligustrum licudum) are declared noxious weeds in the Clarence Valley Local Government Area.

Potential Impacts

The proposal is a conversion of ephemeral structures to permament buildings. During the construction period, the depth to groundwater is likely to be lowered. The lowering of groundwater may adversely impact on the health of the species that occur in areas of high watertables. Montoring and careful management is required during the construction period to minimise the risk to the vegetation of the adjoining Nature Reserve.

7.6.2.2 Conclusion and Mitigation Measures

There appear to be no major flora constraints to development on the Site. The management objectives for Yamba Bay Foreshore Reserve (Purcell 2003) need to be adhered to.

It is recommended that:

- buffer planting on the Site of the local native species, especially groundlayer species with widely spaced tree species, occurs between the carpark near the western boundary of the Site and the drainage channel adjoining the Clarence Estuary Nature Reserve. If there are additional stormwater drainage requirement then this buffer may include widening of the existing drainage channel and planting of wetland species;
- the clumps and scattered individuals of the local native trees on the Site be retained, where practicable, especially larger Melaleuca quinquenervia; and
- local native species, grown from seed collected from nearby Littoral Rainforest stands and of Banksia integrifolia, be utilised in the future landscaping of the Blue Dolphin Holiday Resort site.

7.6.3 Aboriginal Heritage

7.6.3.1 Existing Environment

An Aboriginal Cultural Heritage Sites Assessment was prepared by Ron Heron for the Birrigan Gargle Local Aboriginal Land Council (Appendix 21).

The objective of the assessment was:

> *…to see if there were any Aboriginal Sites of Significance present and to record them if any were found and to recommend ways to avoid the destruction of any sites and to recommend ways of maintaining sites.*

Information was collected from:

- Field survey;
- National Parks and Wildlife Archive;
- Personal records;

- Department of Environment's Aboriginal Heritage Information Management System (15 July 2005);

- Review of Aboriginal Archaeological Sites in the Shire of Maclean: A Heritage Study, *D Byrne* 1986.

No 'Sites of Significance' were located on the site. However:

> *The Reedy Creek Campsite was located in the property adjacent to the Blue Dolphin Holiday Resort to the north-west.*
>
> *This was the first permanent Aboriginal settlement of modern times, after white contact and the development of Yamba township. A survey by Creamer (Godwin and Creamer 1982) located contact campsites significant to the Yagir people of Yamba.*
>
> *…where they lived at Reedy Creek there is a sandy soil mangrove embankment where little pools of water form amongst the mangroves.*
>
> *The precise location of the Reedy Creek campsite is considered sensitive information and is not available. The campsite is contained within the boundary of the Estuary Nature Reserve and this is protected by the Department of Environment and Conservation.*

The Assessment also notes *The Reedy Creek Midden Site:*

> *I don't know if there are any burials in those middens. The area is like a little rainforest right on the edge of the river. At the present time the area is protected and I would like to see it remain that way. The site may be suitable for education and research but not for general public use.*

7.6.3.2 Potential Impact

The site is located on land adjacent to a known Aboriginal campsite. The Reedy Creek campsite is a significant Aboriginal cultural heritage site.

Notwithstanding the above, the Assessment concludes:

- *Provided the proposed development on Lot 8 DP 1022360 does not go outside the boundary of the property and in particular, encroach across the creek there are no issues restricting the proposed development in terms of Aboriginal Cultural Heritage Sites on the property.*

7.6.3.3 Conclusion Mitigation Measures

The field survey did not reveal any Aboriginal cultural heritage sites of significance on the site:

There is no evidence remaining of any significant sites or of use of the site because of the heavy modification of the site from what it would have been like before construction.

The search of the Department of Environment and Conservations Aboriginal Heritage Information Management System revealed that there were no sites recorded for the Blue Dolphin.

Whilst not within the site boundaries, the Assessment recommends the following:

- *The walkway located along the foreshore of the resort (some of this may be on Crown reserve) should remain because this is where the old pathway was that was used in traditional times and during the time of Reedy Creek campsite;*

- *A Storyboard telling the story of the Reedy Creek campsite should be included along the walkway in consultation with the Birrigan Gargle Local Aboriginal Land Council*

7.6.4 European Heritage

7.6.4.1 Existing Environment

European heritage was addressed in the previous environmental assessment undertaken by Sustainable Futures Australia (see Page V of the Executive Summary reproduced at **Appendix 2** to this report). A further review of heritage listings within the **Maclean Local Environmental Plan 2001** and the State Heritage Register did not identify any buildings structures or other relics of European settlement on, or within the vicinity of, the subject site.

7.6.4.2 Conclusion and Mitigating Measures

As such, the proposed concept plan will not significantly impact upon any listed buildings structures or other relics of European settlement.

7.7 Bushfire Protection

7.7.1 Existing Environment

A Bushfire Hazard Assessment was prepared by GHD in accordance with *Planning for Bushfire Protection* (PBP) (**Appendix 9**). Two site inspections assessed slope and vegetation types. Vegetation type was assessed based on the vegetation structure, canopy height, canopy percentage cover, understorey height and understorey percentage. The Assessment provides:

Existing vegetation comprises, open, mown and maintained grassland. The site is also landscaped with scattered trees and shrubs.

To the west, the site adjoins the Clarence Estuary Nature Reserve, approximately 120 hectares in area. This vegetation was assessed to be Vegetation Group 2 under NSW Rural Fire Service *Planning for Bushfire Protection (PBP)*.

The site is listed on Council's records as bushfire prone land. Existing buildings are setback 2-4 metres from the Clarence Estuary Nature Reserve boundary.

The slope of the site and surrounding land is 0-5°.

7.7.2 Potential Impacts

Asset Protection Zones (APZ's) act as a buffer between the development and the hazard and are the principal fire protection mechanism.

The Bushfire Hazard Assessment provides:

> *Vegetation types present different levels of fire hazard. The level of fire hazard also varies with slope and the type of development… Considering the slope, vegetation and type of development the APZ was determined for the site in accordance with PBP.*

The proposed development along the western boundary is consistent with being "tourism accommodation" under S100B of the rural Fires Act and hence "special protection development".

Planning for Bushfire Protection recommends, for "special protection development", an APZ of 40m, consisting of an Outer Protection Area of 15m and an Inner Protection Area of 25m.

However, the Bushfire Hazard Assessment provides:

> *Considering the factors and circumstances identified in discussions with the NSW Rural Fire Service, this development is not at significant risk of bushfire.*
>
> *The characteristics of the site, the development and the proposed additional measures provide a merit-based argument to support the 30m APZ proposed in the concept.*

The justification for the 30m setback is based on:

- *The site is flat, with slight, to no slope;*
- *Existing buildings are setback between 2-4 metres;*
- *There is an open, natural drain, about 2m wides along the boundary between the Clarence Estuary Nature Reserve and Lot 1;*

- *A 30m APZ is suitable for residential development. Local government consider the development to be 'residential';*

- *In terms of the buildings themselves…there is very little difference between the strata title units and the units of the tourism development in terms of floor plan or construction.*

Notwithstanding the above, the proposal adopts mitigating measures to manage the fire hazard and these are identified below.

The Inner Protection Area incorporates an access road which will serve as a fire break and provide:

- *Easy access for firefighters allowing more efficient use of fire fighting resources;*

- *A safe retreat for firefighters; and*

- *A clear control **line** from which to conduct **back-burning** operations if necessary*

In addition, the Bushfire Hazard Assessment confirms that the water supply at the site is connected to Yamba's reticulated water supply and is considered to be appropriate for fire fighting purposes. The development is also adjacent to the Clarence River which could provide supplementary water if required.

7.7.3 Conclusion and Mitigation Measures

The Concept Plan proposes an Asset Protection Zone of 30m along the western boundary. The Bushfire Hazard Assessment concludes:

> *In view of the points discussed with NSW Rural Fire Service, characteristics of the site, the development and the Additional Bushfire Mitigation Measures set out in Section 5.5 of this report, it is considered that there is a merit based argument to support a 30m APZ as shown in Figure 4.*

The Bushfire Hazard Assessment recommends preparation of an Asset Protection Zone Maintenance Plan. Given the separation distance between the fire hazard and Stage 1, (250m) and the subsequent fire break, an Asset Protection Zone Maintenance Plan has not been prepared for Stage 1, but will be addressed as part of any further application, for the remainder of the Concept Plan.

The Asset Protection Zone Maintenance Plan will include commitments to ensure that the IPA will be maintained such that:

- *There is minimal fine fuel that could be set alight by a bushfire;*

- *Tree crowns are discontinuous;*

- *The IPA should be kept free of fuel through regular mowing with less than three tonnes per hectare of fine fuel present at any time*

In relation to the Outer Protection Area, the Asset Protection Zone Maintenance Plan will ensure:

- *In the absence of any other policy, the recommended fuel level is 8 tonnes/hectare (Planning NSW 2001)*

The following access criteria will also be considered as part of the Asset Protection Zone Maintenance Plan:

- *A minimum trafficable width of 4m with an additional 1m wide strip on each side of the road kept clear of bushes and long grass;*

- *The road should have a passing bay about every 200m where possible, which should be 20m long by 3m wide, making a minimum trafficable width of 7m at the passing bay;*

- *The capacity of road surfaces and bridges should be sufficient to carry fully loaded firefighting vehicles;*

- *A minimum vertical clearance of 6m to any overhanging obstructions, including tree bracnches;*

- *Curves should have a minimum inner radius of 6m and be minimal in number to allow for rapid access and escape;*

- *The minimum distance between inner and outer curves should be 6m;*

- *The maximum grades should not exceed 15* ***degrees*** *and preferably not more than 10* ***degrees****;*
- *Roads should provide sufficient width to allow firefighting vehicle crews to work with firefighting equipment about the vehicle.*

The following water supply criteria will also be considered as part of the Asset Protection Zone Maintenance Plan:

- *Fire hydrants must be accessible and located such that a tanker can park within a distance serviceable by a 20m hose and the habitable building must be located such that fire at the furthest extreme can be attacked using a 60m hose and 10m jet of water.*

- *A clear unobstructed path between the hydrant and most distant point of the building cannot exceed 90m allowing for the tanker to be parked inline.*

The following additional measures will be considered as part of any further application, for the remainder of the Concept Plan:

- *Building and Fire Engineering measures (as set out in Section 5.5.1 of the Bushfire Hazard Assessment);*
- *Preparation of an Operation Management Plan* ***for the period of construction****; and*
- *An Emergency Response Plan (as set out in Section 5.5.3 of the Bushfire Hazard Assessment).*

7.8 Economic Impact

7.8.1 Existing Environment

An Economic Impact Assessment has been prepared by JHD Urbis in relation to the proposed development. The assessment was conducted in order to determine the economic benefits of the proposed development to the Northern Rivers Region, which incorporates a coastal stretch of land from the Tweed Shire in the north to the Grafton and Maclean shires in the south.

The report established that at present, there is a moderate provision of resort and motel accommodation in Yamba, with the quality of accommodation ranging from 3.5 to 4.5 stars. In terms of residential units, the report found that the current provision is of a mostly modest standard, with many having been built 30-40 years ago and as such are now looking quite aged. At present, the tourist and visitor accommodation market in Yamba is dominated by budget accommodation options such as caravan parks, accounting for 70.1% of supply.

The site itself presently comprises 69 ensuite sites, 94 powered sites and 2 unpowered sites. In addition, the resort provides a range of recreational, retail and convenience facilities for the patrons of the site. These include conference facilities, a café/coffee shop, a swimming pool, tennis court, barbeque and on site petrol and LPG pumps.

7.8.2 Potential Impacts

The proposal will involve the redevelopment of the existing tourist facility into a high quality residential and resort development in three stages over a five year period. Stage 1 will include the provision of 55 residential units in two blocks, providing a mix of 1 and 2 bed flats. Stage 2 and 3 will involve the provision of additional tourist and residential accommodation, providing a total of 117 units in the tourist accommodation and169 residential units.

Once completed, the development will comprise 224 residential units and 117 tourist units. This will result in a 14% addition to the current supply of overall accommodation in Yamba. The redeveloped holiday resort will be of five star quality and as such, it is anticipated that it will attract visitors from the 'luxury traveller' group to Yamba. The report concludes that the provision of this additional accommodation *"will greatly*

improve the quality and range of accommodation options" in Yamba. The assessment identifies that population growth is a major driver of the demands for residential accommodation and it is anticipated that population growth for the Clarence Valley (A) – Maclean SLA is expected to be 180-240 persons (1.2% to 1.3%) per annum between 2006 and 2016. The proposed residential accommodation will aid in accommodating this increased population.

The assessment states that the proposed redevelopment will generate a significant amount of expenditure and employment benefits both during the development phase and the operational phase of the concept plan. In addition to direct expenditure and employment benefits, the economic assessment anticipates that there will be also be indirect flow on (multiplier) benefits generated in the local region.

The report anticipates that $512 million will be created in direct and indirect output impacts during the development phase, of which $238 million will be incurred in the local Northern Rivers Region during the five year development period. The residential component will generate $28 million per annum in direct and indirect output impacts during the operation of the facility of which $16 million will be incurred in the Northern Rivers Region on an ongoing basis. The tourist facility component will generate $25 million per annum in direct and indirect output impacts during the operation of the facility of which $23 million will be incurred in the local Northern Rivers Region. The total tourist facility will generate $1.9 million per annum in direct and indirect output impacts during the operation of the facility of which $1.1 million will be incurred in the Northern Rivers Region on an ongoing basis. 228 FTE jobs will be created during the five year development period, of which 123 FTE jobs will be created in the local region. 40 FTE jobs will be created on an ongoing basis from the operation of the proposed development, of which 36 FTE jobs will be local.

7.8.3 Conclusion and Mitigation Measures

The report concludes that:

- *"The proposed redevelopment will increase the employment opportunities for the Northern Rivers region which has an unemployment rate 4.9% higher than the NSW non-metropolitan;*

- *Currently budget accommodation accounts for an estimated 70% of the accommodation market in Yamba. Thus there may be an undersupply of resort accommodation and hence an opportunity to increase this segment of the market to cater for expected increased demand and also raise the tourism profile of Yamba;*

- *The recent establishment (three to five years ago) of high quality residential apartment complexes may indicate an increased demand by permanent residents in Yamba for the type of accommodation proposed by this development;*

- *Strong expected future population growth to Clarence Valley (A) Maclean SLA (incorporates Yamba) of 1.2% to 1.3% average annual growth over the period*

2006 to 2016 is expected to create strong demand for future residential accommodation in Yamba;

- *Based on these projected population growth rates from 2006 to 2016, this may represent increased demand for 75 to 90 new dwellings per year in the Clarence Valley (A) – Maclean SLA."*

Based on the economic benefits the proposed development will have on Yamba, mitigation measures will not be necessary.

7.9 Utilities and Servicing

The Infrastructure Provisions Report, prepared by Norman Disney Young (NDY) (Appendix 17) provided an overview and analysis of the existing service infrastructure on the site, an overview of the proposed service system and recommendations relating to the systems proposed for implementation.

7.9.1 Existing Environment – Water and Sewer

NDY confirms that potable water is currently supplied by North Coast Water and that there are two water mains within Yamba Road, one of which carries three current connections points to the site at present. The NDY report confirms from their initial investigations the present water connection points will require further upgrades in size in order to meet the increased demand on the site. Discussions by NDY with North Coast Water indicated that the existing main and the water volume available will be sufficient for the proposed development.

In terms of a potable water system, the report confirms that the local connection supply will use the three existing connection points which will serve the three distinct areas, as follows:

- Residential Stage 1 (Meter 1)
- Holiday Apartments Stage 2 (Meter 2)
- Residential Stage 3 – (Meter 3)

NDY confirm that cold water will be provided to the site through three dead leg systems, which will operate independently of each other. As a result of this, existing connection points to the authority's mains will be upsized as required. Hot water will be provided through a Gas hot water system. The report confirms that in terms of Stage 1 development, hot water will be provided by instantaneous gas units located in plant rooms. Hot water will reticulate from each unit to the fixtures in the apartment and a separate unit will be provided for each apartment. The Stage 1 buildings can therefore be operated independently of Stages 2 and 3.

The NDY report confirms that sewer services are currently provided by North Coast Water and consist of a 150 diameter sewer mains, which also carried two current

connection points to the site. Drainage is undertaken by a gravity system to meet the board sewer located in Yamba Road.

7.9.2 Potential Impacts – Water and Sewer

NDY confirm that due to the proposed layout of the development, all on site drainage would require rectification and re-routing. Recommendation is made to disuse and replace the existing system with a new system. Discussions with Greg Mashiah of North Coast Water by NDY concluded that the existing main and the volume available should be sufficient for the proposed development. NDY conclude that *"the additional load should not have a major effect on the infrastructure requirements'* and propose that a sanitary system designed to AS3500.2 be recommended for design.

In terms of storm water, all roof water will be drained by eaves gutters, rain water outlets and down pipe system, which will be captured and directed to a localised rainwater harvesting system for re-use within apartments for toilet flushing, washing and irrigation.

7.9.3 Existing Environment - Electricity

NDY confirm that at present, the site is provided with three separate low voltage supplies from County Energy's local low voltage network (located on Yamba Road). NDY confirm that the load demand of the site at present is approximately 500kVA, which is below the projected maximum demand of the proposed development.

7.9.4 Potential Impacts - Electricity

Based on discussions held by NDY with Country Energy, the total load (including the resort and residential facilities of Stage 1 and 2 together) cannot be supplied from Country Energy's low voltage network. NDY state that high voltage feeders will have to be installed from Country Energy's high voltage network and subsequently distributed by installing substations. NDY propose that 2 off 1500kVA substations be installed within the facility to supply the anticipated load. This will involve the installation of under ground high voltage cables from Yamba Road to the two substations.

In addition, NDY confirm that energy efficient lighting will be considered for internal and external lighting for the site and that at design stage, feasibility for the use of solar panels will be explored.

7.9.5 Existing Environment - Gas

NDY confirm that the gas supply to the site currently provided through one storage tank leased from Elgas. Gas is used for personal LPG bottle filling and is also reticulated to barbeque areas, communal areas and hot water plant servicing the amenities. There is no natural gas reticulation provided by a utility for possible connection.

7.9.6 Potential Impacts - Gas

NDY confirmed that the existing capacity of the gas supply has been designed to accommodate the current demand of the site and as such the existing reticulation system would not be sufficient to supply the proposed development. Additional capacity will therefore be required.

NDY propose two storage tanks will be located throughout the site, as required, from which a gas reticulation network is buried in ground and piped to each apartment block and villa.

7.9.7 Conclusions and mitigation measures

In order to achieve this, NDY advises that all apartments will have to sign on as gas users, and the number of apartments must be great enough for the sale to be profitable for Elgas.

7.9.8 Existing Environment - Waste Disposal

At present, the waste from the site is collected by Clarence Valley Council.

7.9.9 Potential Impacts – Waste Disposal

A Waste Management Plan has been prepared by ACOR Consultants (see Appendix 25) which identifies and assesses the options for waste management and resource recovery for the proposed development during both the construction and operational phase of the proposed development.

During the construction phase, ACOR proposes that waste containers and storage areas not be located in one centralised location but rather the Construction Contractor allocate a waste are in the vicinity of the work area. ACOR advise that this will allow easy access and encourage recycling. In order to ensure proper waste management, all contractors will receive training, as part of the Construction Site Induction package.

ACOR advise that skip bins or Lift-On Bulk Bins will be used as they suit a wide range of non compactable solid waste material. It is proposed that they be provided and collected for off-site waste recycling or disposal by a waste contractor for the site.

In terms of operational waste, ACOR recommend that residential waste containers be stored in communal areas where appropriate to ensure ease of access to residents and to the waste collection service. A garbage shoot has been provided at each core at each level of Building 1 and 2, while on ground level a common garbage storage area has been provided near the road entry. Facilities for recycling will be provided in the garbage rooms located in the basement of each building (see Basement Car Park Plan, Ref. CP 102 and Ground Floor Plan, Drawing Ref. CP 103, prepared by Woodhead architects). ACOR proposed that organic waste be collected with green landscaping waste for composting and reuse.

In terms of hotel waste, ACOR recommended that it be stored in a centralised waste storage room and a waste compactor installed. Due to the high amount of putrescible

wastes generated ACOR recommend that the hotel waste be collected on a daily basis and if not, they will have to be stored in a refrigerated waste room. It is recommended that the waste storage areas are stored at ground or basement level to afford minimal noise and visual impact.

7.9.10 Conclusion and Mitigation Measures

The provision of a waste management plan seeks to control the management of wastes and reusable/recyclable resources throughout the demolition, construction and operational stages of this development. Providing the recommendations of the management plan are put in place, mitigation measures should not be necessary.

7.9.11 Existing Environment - Telecommunications

NDY confirm that the current communications to the site are provided by lead-in copper cables from Telstra's local network, which is located on Yamba Road and as such there is insufficient capacity to serve the proposal.

NDY confirm that the proposal will include the installation of a building distributor for the resort facilities with a lead-in cable from the local Telstra network. Cables will be distributed to each of the resort buildings and villas from the distribution frame. It is proposed that the communications system for the resort and the residential facilities are kept separate.

Given the fact that the proposal will improve the services to the site, mitigation will not be necessary.

8 ENVIRONMENTAL ASSESSMENT – COMMUNITY TITLE SUBDIVISION

8.1 Subdivision Layout, Desired Future Character and Sustainability

8.1.1 The suitability of the proposed development with the surrounding area

Yamba is a coastal centre, a major growth area and principal coastal resort in Clarence Valley. Yamba is characterised by a mix of uses, including residential, commercial, educational and tourist resorts/facilities. The site is located adjacent to an existing Motel (Moby Dick Motel) (2 storeys) and is located opposite existing low density residential dwellings, along Yamba Road. To the north east is the Clarence River and to the north west is the Clarence Estuary Nature Reserve, with the site at present, being in use as a tourist facility. The site and surroundings of the site is therefore varied in terms of use and design.

The proposal incorporates three stages of development, with Stage 1 and 3 being residential accommodation and Stage 2 tourist accommodation, with each stage incorporating parking, landscaping and recreational areas. The use of the site is therefore compatible with the surrounding area.

The proposal has been designed to ensure appropriate development for the site, taking into account the existing form and design of the surrounding developments. The setback, form and axis orientation of the buildings is varied as a result. Building materials are reflective of place which ensures that the proposal respects the character of the surrounding locality. The facades of the buildings have been designed to integrate the buildings into the local context with a considered balance of bulk and scale. Careful landscaping will ensure the buildings are integrated into the area and building heights have been designed to be in keeping with the existing tree heights on and adjacent to the site.

The proposal in terms of use and design is therefore suitable.

8.1.2 Subdivision design and identification of areas of community title and strata title control and management

The Community Plan, prepared by Denny Linker confirms that the site will be divided into four lots. The details of the subdivision are provided in Appendix 5, prepared by Denny Linker, the details of which are as follows:

"Lot 1 - Community Property Lot 1

The Community Property Lot will comprise those parts of the development which contain shared/community facilities. These facilities include:

- *The main entry road into the resort component.*
- *The residential ring road into the residential component.*
- *Car parking/visitor parking bays adjacent to the ring road.*
- *Common footpaths and walkways.*

- *Common facilities including substation, gas storage facilities and switch rooms.*
- *Common services.*

Lot 2 - Community Development Lot 2 - being Stage 1 of the development and comprising residential buildings 1 and 2. Development Lot 2 will be subject to a strata subdivision.

Lot 3 - Community Development Lot 3 - being Stage 2 of the development and comprising the resort buildings 9 and 11 to 15. Development Lot 3 may be subject to further community and strata subdivision during the course of the project.

Lot 4 - Community Development Lot 4 - being Stage 3 of the development and comprising residential buildings 3 to 8, 10 and the villas. Development Lot 4 may be subject to further community and strata subdivision during the course of the project."

Appropriate Subdivision Layout/s and proposed staging

The lots will allow the development to take place as a staged development. Stage 1 includes Lot 1 and 2, Stage 2 includes Lot 3 and part of Lot 1, and Stage 3 will include Lot 4 and part of Lot 1. This will enable Stage 1 to be developed separately to Stage 2 and 3 and in addition, will ensure the care, control and maintenance of each stage is limited to its assigned Lot. All stages will however contain parts of Lot 1 as the road network etc will be constructed progressively as each stage is completed.

Easements

In addition, the Community Plan creates a number of easements throughout the site, as follows:

"Public Access Easements

An easement for public access is to be created over parts of Community Property Lot 1 and Community Development Lot 4. The public access easement will provide for public access to the Clarence River.

The easement will permit both pedestrian and vehicular access. However, the easement terms will prohibit vehicular access to vehicles towing trailers of any kind. Further, the terms will also prohibit access to the public until after the construction and certification of roads and paths within the easement site.

Easement for Recreational Access

An easement for recreational access will permit the residents of the strata schemes within Stage 1 and Stage 3 respectively to access each others pathways and walkways for recreational purposes.

Easement for Services

Community Property Lot 1 will be burdened by an Easement for Services in favour of the adjoining development lots 2,3 & 4.

Additional Easements

It is envisaged that the need for additional access and service easements will become apparent as the project develops."

The provision of the easements are necessary to enable the site to function and will allow interaction between residents as well as interaction between the different stages of development, thereby ensuring each stage of development once completed is not isolated from the other. In addition, the easements will provide a public access to the Clarence River, which at present is landlocked and accessible only by the patrons of the site.

In terms of a Community Management Statement, Denny Linker confirm that a *"Community Management Statement (CMS) will be required to facilitate the ultimate registration of the Community Subdivision. The CMS will deal with the management of all Community Property, together with additional items which allow for the effective development, staging and management of the community scheme.*

The CMS will also include the necessary documentation for the creation of Open Access ways and Statutory Service Easements, together with Concept Plans identifying community facilities and Restricted Community Property."

8.1.3 Pedestrian & bicycle movement to, within and through the site

Yamba road has a relatively extensive bicycle route network, with marked bicycle lanes provided on the road shoulders of the site frontage. The proposal involves the retention of the 5.5 metre bike/parking lane along Yamba Road. In terms of access to the site, two vehicular entrances are proposed, from which the site will also be accessed by pedestrians and cyclists. Median strips will be provided on Yamba Road to increase pedestrian safety.

Additional formal pedestrian and cycle pathways will be provided on the site and this will reduce the conflict between vehicles and humans. There will be pedestrian paths running alongside all roadways shown within the site; separate cycle pathways are not included as traffic speeds and volume within the site are low, bicycles will thus share the roadways within the site. The roadways will accommodate pram and wheelchair crossing points wherever paths cross the roads.

Simple and clear circulation will be provided in a safe environment, which will be further enhanced by the provision of way finding systems. The pedestrian network in the site will allow for public access through using formal path and shared road access connecting Yamba Road to the river foreshore. A pedestrian connection will be provided from Stage 1 on grade car park to the foreshore. In addition, a private path network will allow for interconnection between the residential apartments and recreational areas in the site.

The site will be well lit to maintain safety for both pedestrian and cyclists.

8.1.4 Details of proposed Staging and assessment of implications in terms of impact on subdivision design and infrastructure provision

Stage 1

Stage 1 of the concept plan includes;

- site preparation (including bulk earthworks subject to sediment and erosion controls);
- construction of two residential flat buildings (consisting of four storeys and 55 residential units) with basement car parking;
- landscape works and swimming pool;
- internal access road; and
- construction of a detention basin and other such ancillary services and infrastructure.

Construction would be expected to be completed within eighteen months and would be carried out during normal construction hours.

Stage 2 of the concept plan will include the above works, but will provide six tourist accommodation buildings (varying in height from three to four stories and 117 units) with basement car parking.

Stage 3 of the concept plan will be as above but will include the provision of seven residential flat buildings (varying in height from two to five stories and will provide 24 1 bed units, 99 two bed units, 20 three bed units, 14 penthouse apartments and 12 detached villas) with basement car parking;

Stage 1 of the development has been designed to ensure that it can operate independently from the proposed Stage 2 and Stage 3 development phases and does not rely on the infrastructure works within the Stage 2 and 3 developments. In addition, Stage 1 has been designed to ensure that it can also operate whilst the existing caravan park is still in operation.

8.1.5 Coastal Design Guidelines for NSW (2003)

These guidelines illustrate how an urban design approach informs developments which are sensitive to the natural and urban characteristics of coastal places located in New South Wales. They consider the NSW coast in terms of a hierarchy of settlements, providing a framework for analysing and understanding the important relationships between settlements and the local, urban and natural areas, and between neighbouring settlements and reserves. The Guidelines recognise that settlements are under different levels of development pressure independent of urban and natural characteristics.

The guidelines state that at a regional scale, a hierarchy of settlements will:

- *establish the current and future importance or role of each place within the region and the local area.*
- *provide a framework for planning the distribution of population and infrastructure*

At a local scale, working within the settlement hierarchy supports the following key objectives:

- *To protect and enhance the cultural, ecological and visual characteristics of a locality.*
- *To limit coastal sprawl by establishing separation and greenbelts between settlements.*
- *To integrate new development with surrounding land uses.*
- *To integrate land use with transport.*
- *To protect local character.*
- *To encourage new coastal settlements to be appropriately located.*
- *To create neighbourhoods centred around services and facilities.*

The Guidelines identify the different settlement types and Yamba would fall into the category of a Coastal town.

The key challenges for coastal towns to address are identified as follows:

- *degradation of the economic viability of the town centre by new commercial and retail uses, development located remote from the town or its commercial centre*
- *impact on the environment and reduction of the existing town's character and viability, caused by new settlements and major commercial, retail and tourist developments*
- *ribbon development reducing the natural and rural lands that separate settlements because of the location of new release areas*
- *degradation of water quality in waterways and coastal lakes*
- *protection of heritage values*
- *placing buildings and infrastructure in areas subject to natural hazards*
- *strip development along roads and highways.*

Five principles for coastal settlement structure describe elements of the public domain and the built form that reinforces it. They 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 are:

1. *Defining the footprint and boundary of the settlement describes how to establish the outer limits of a settlement to protect the important visual and natural setting.*
2. *Connecting open spaces illustrates how open space creates recreation, conservation, public access, cultural and heritage opportunities in and around the settlement.*
3. *Protecting the natural edges of the settlement shows how the coastal edge is protected and understood as a public place, with public access and ecological values including mitigating the impacts of natural hazards.*
4. *Reinforcing the street pattern highlights how streets enliven centres, connect important places within and around the settlement, allow for improved choice when moving from place to place, and provide commercial and social benefits.*

5. *Appropriate buildings in a coastal context shows how specific development relates to the site's natural features and to its location within the settlement.*

Prior to the proposal being designed a site analysis was undertaken. This allowed the strengths, weaknesses, opportunities and threats to the site to be identified. The design of the proposal took into account its waterfront location, resulting in a carefully designed development compatible with its surroundings which improves access to the currently landlocked waterfront. In order to reduce the impact on the surrounding area and protect views both to and from the site, the proposed building heights were varied (with the lower building being located adjacent to the waterfront reserve) and building materials were carefully selected to ensure they were compatible with the surrounding character of the area. Although the building heights are higher than those desired in the guidelines, given the careful orientation and variety in heights together with the careful use of materials, this has ensured that the impact of the proposal will not be detrimental to the surrounding area. In order to demonstrate the impact of the proposal in terms of views, perspectives were prepared by Woodhead (see **Appendix 3**). It is evident from these perspectives that the buildings are appropriate in a coastal context and relate well to the surrounding area.

A shadow assessment was also carried out to assess the degree of overshadowing that would result from the proposed development **(Appendix 13**). This showed that overshadowing will be marginal when compared to the overshadowing currently caused by the existing mature evergreen trees on the waterfront reserve and that the surrounding existing buildings will not be negatively impacted.

The proposal provides a high quality design, which will integrate well into the area as a result of careful design. It will provide additional accommodation in Yamba whilst also creating additional employment.

The aims and objectives of the Coastal Design Guidelines are further addressed in **Sections 7, 8** and **9** of the EA.

8.1.6 NSW Coastal Policy 1997

The Coastal Policy provides a framework to ensure a balanced and co-ordinated management of the coast's unique physical, ecological, cultural and economic attributes. It represents an attempt by Government to better co-ordinate the management of the coast by identifying in a single document the State's various management policies, programs and standards as they apply to a defined coastal zone. This Coastal Policy is therefore many individual policies and programs in one.

Many of the salient features of the Coastal Policy have been given statutory voice through the provisions of the North Coast Region Environmental Plan and within the Matters for Consideration contained within State Environmental Planning Policy No. 71 – Coastal Protection. Nonetheless, the provisions of the Policy, where relevant, are addressed below.

The proposal is located to the south of the Clarence River and within the Coastal Zone, therefore the NSW Coastal Policy must be considered. The objectives of the Policy relevant to this application are addressed below.

A Project ESD Framework Report has been prepared by Sustainable Futures Australia (see Appendix 22) in support of the proposal. This report outlines the proposed Ecologically Sustainable Development Framework for the site and provides information in terms of the initial planning and design phase as a basis for the development and also

information regarding the operational and management phases of the project. The report looks at various site systems and components and identifies the aims, strategies and good practice options in relation to each. This includes integrated water systems, communication systems, resource use and landscaping systems. This as a result has helped to promote ecologically sustainable development and compliance with the NSW Coastal Policy.

In addition, as part of the development, a landscaping scheme has been designed which will ensure suitable landscaping occurs on-site, incorporating indigenous plant and tree types, which will assist in rehabilitating and enhancing the natural environment. In addition, it is proposed that additional planting occur in the adjacent waterfront reserve. This as a result has helped to promote ecologically sustainable development (Objective. 1 & 5)).

The proposal has been carefully designed to ensure minimal adverse visual impact. This had been achieved through a variation in building heights and orientation, careful staggering to avoid the creation of a wall of buildings. The building heights have been designed to generally fit within the predominant tree line of the existing trees located on the adjacent waterfront reserve. Materials used are reflective of place and include the use of timber, stone and glazing in colours consistent with the character of the locality. This will ensure the aesthetic qualities of the coastal zone will be both protected and enhanced (Objective. 3).

An Aboriginal and Cultural Heritage Assessment confirmed that there were no cultural heritage items on the site (appendix 21) (Objective.4).

The proposal has been designed to provide high density development whilst also seeking to reduce the impact on the surrounding area though careful siting of buildings. Habitable rooms are orientated to the north to maximise solar gain, whilst over 80% of units are cross ventilated. Rainwater will be collected on building roofs and harvested for reuse on site for toilet flushing and the irrigation of landscaped areas. In addition, the provision of a stormwater management system to effectively treat onsite, and minimise stormwater disposal will minimise stormwater run-off. This will help in achieving a more ecologically sustainable human settlement (Objective. 6).

The proposal will improve public access through the site to the existing waterfront reserve, which is currently landlocked, which will increase the amount of open space available to the public. This will help in providing for appropriate public access and use (Objective 7).

Other objectives are not directly applicable, given the location and nature of the development.

8.1.7 Coastline Management Manual

The Coastline Management Manual was produced to assist local councils develop balanced plans of management for the coastline. The Manual states that the scale and bulk of buildings may be limited by development control conditions in order to maintain the damage potential of hazards at low levels, as well as for other planning purposes such as avoiding overshadowing of beaches. In addition, advice is provided on foundation design and flood mitigation, however much of the manual is not applicable to the development.

As detailed throughout this EA, the design of the development has taken into account its waterfront location, resulting in a carefully designed development compatible with its surroundings. The views from the Clarence River are protected, given the careful siting

of the buildings, their variation in heights (with the lower building being located adjacent to the waterfront reserve) and the existing mature vegetation of the waterfront reserve (whereby the proposed buildings respect the predominant tree line of the existing trees). Perspectives produced by Woodhead (Drawing Ref. CP010) illustrate the impact the proposal will have from views from the waterfront and it is evident that as a result of the careful use of materials, the orientation and staggering of buildings, that the impact will be minimal. In addition, the results of the shadowing assessment at **Appendix 13** show that overshadowing will be marginal when compared to the overshadowing currently caused by the existing mature evergreen trees on the waterfront reserve.

In terms of foundation design, details are provided in the attached Geotechnical Report at Appendix 12, whilst details regarding flood mitigation are provided in the Sustainable Water Management Report at Appendix 18.

8.1.8 Clarence Valley Council DCP – Development in Residential Zones – Subdivision and Engineering Standards

Part H of the Clarence Valley Council DCP on Development in Residential Zones details the requirements in relation to Subdivision and Engineering Standards. The revised Director General Requirements dated 19 October request that the development is assessed against the provisions of the Maclean Shire Council's DCP on Subdivision Guidelines. It should be noted that the latter DCP is now superseded by The Clarence Valley Council's DCP, which was adopted by Council on 1 November 2006.

The objectives of the CVC DCP are as follows:

(a) To provide engineering standards for development and subdivision in residential zones.
(b) To ensure that subdivision relates to the characteristics of a site or locality.
(c) To ensure subdivision of residential land that is adequately serviced.
(d) To ensure road design is safe and suitable for residential development.

The DCP requires that development consent be obtained for any subdivision. As such, strata subdivision plans of the Stage 1 development have been prepared by Linker & Barker. These plans identify the individual units in Buildings 1 and 2 and any common property within the revised Lot 2. Based on these plans together with the Stage 1 plans, prepared by Woodhead architects, the proponent is seeking approval to proceed directly to application for registration of subdivision.

The DCP requires that a Site Analysis Plan is submitted with any development application for subdivision. The Site Analysis Plan is required show the opportunities and constraints relating to the proposed subdivision and future use of the land and should be used to prepare the Statement of Environmental Effects, which must also accompany the development application. A Site Survey Plan (**Figure 14**), Site analysis diagram (CP002), and Concept Diagram (CP 003), prepared by Woodhead architects provide a comprehensive analysis of the site and show the opportunities and constraints relating to the proposed subdivision and future use of the land. These plans provide a locality plan, aspect, waterways, vegetation, flood liable land, the topography of the site, bush fire prone land, , surrounding land uses etc. Additional drawings in the Geotechnical Report (at appendix 12) and Dewatering Management

Statement (at Appendix 20) provide additional details in relation to service connections, soil conditions, and waste disposal areas, whilst the Community Subdivision Plan provides details on the proposed lots and easements on the site.

The Environmental Assessment and attach Consultant Reports provides sufficient information to address the road network/street pattern, lot layout, site access, stormwater management, street planting and services as required by the DCP.

8.2 Watercourses and Watercourse Crossings

8.2.1 Existing Environment

No natural watercourses are identified on the site.

8.2.2 Potential Impacts

Whilst no natural watercourses are identified on the site, the proposal incorporates a number of man made ponds and water features. These water features are located at the western entrance to the site and along the northern boundary.

The Assessment provides:

> *Due to the relatively high permeability of the underlying soils, these ponds will need to be lined to enable water retention. However, in making the ponds watertight, unless mitigation measures are adopted in the design, the underside of the liner will be subjected to hydrostatic water (uplift) pressures in the event of groundwater level rise. This could result in the pond liners lifting, and potentially being damaged, depending on the materials used in their construction.*

8.2.3 Conclusion and Mitigation Measures

In relation to pond liner and the potential for groundwater rise:

> *Options for the liners could include reinforced concrete, clay or a form of synthetic low permeability barrier such as HDPE liner.*
>
> *Options for reducing the risk of hydrostatic uplift and potential damage to the liner include structural solutions such as tie down, or other options such as the incorporation of one-way valves that allow water to flow to the top of the liner as groundwater rises, (therefore equilibrating the pressure top and bottom), but not to flow back once the groundwater level falls.*

9 ENVIRONMENTAL ASSESSMENT – STAGE 1

9.1 Design, Visual Impacts and Design Quality Principles

9.1.1 Consistency with the character of development in terms of the locality

9.1.1.1 Existing situation

Yamba is a coastal centre, and is a major growth area and principal costal resort in Clarence Valley. Yamba is characterized by a mix of uses, including residential, commercial, educational and tourist resorts/facilities. The site itself is in use as a tourist facility, and is located adjacent to the Moby Dick Motel and is located opposite low density residential units, located on Yamba Road. The character of the locality is therefore clearly mixed.

9.1.1.2 Potential Impacts

The provision of a residential development in Stage 1 will ensure the use of the site is consistent with the character of the locality, considering the site is located opposite a number of dwellings on Yamba Road.

9.1.2 Consistency with the character of development in terms of the street frontage

Buildings 1 and 2 have been designed with generous setbacks to ensure consistency with the street frontage of Yamba Road with Building 1 being set back between 50 and 65 metres and Building 2 being set back over 15 metres from the site boundary. In addition, a landscaped area provided between Building 2 and the Yamba Road frontage will provide visual screening both to and from the site. The careful use of building materials, generous setbacks and landscaping will ensure Buildings 1 and 2 are consistent with the character of the street frontage.

9.1.3 Consistency with the character of development in terms of Scale

9.1.3.1 Existing Situation

At present, the site is in use as a holiday resort consisting of holiday cabins and powered caravan and camping sites. In addition, the resort contains a service station and convenience store; a take-away food store and restaurant area; a resort office and residential complex; Conference rooms; and outdoor recreational facilities. Buildings are one storey, largely timber, many of which are semi-permanent structures located throughout the site.

The site is located adjacent to the Moby Dick Motel (two storeys in height) (situated to the south east), the Clarence Estuary Nature Reserve (situated to the north west), with the Clarence River and waterfront reserve situated at the rear of the site (east). The southern boundary of the site is bound by the Yamba Road, across from which are low density dwellings. The character of the surrounding locality is therefore varied in terms of scale.

9.1.3.2 Potential Impacts

The proposed building heights are four storeys and in order to reduce the perception of scale are carefully fenestrated and incorporate building materials which are 'reflective of place'. The orientation of the buildings are varied and this together with careful landscaping and generous set backs has helped to reduce the scale of the proposal and therefore ensure minimal impact on the surrounding locality. In addition, the buildings have been designed to fit with the predominant mature tree line on the subject site, waterfront reserve and adjoining land to the west of the subject site. This is evident in the Perspectives produced by Woodhead architects, Drawing Reference CP010.

9.1.4 Consistency with the character of development in terms of Built Form

9.1.4.1 Existing Situation

As discussed above, the character of the surrounding area is mixed, consisting of different land uses and consequently a mix in terms of built form, with the two storey Moby Dick Motel to the south east and the low density residential units located on the opposite side of Yamba Road to the west.

9.1.4.2 Potential Impacts

- Building 1 and 2 have been designed to ensure appropriate development for the site, taking into account the existing form and design of the surrounding development. The setback, form and axis orientation of both buildings is varied as a result.
- The Stage 1 buildings have been designed to fit within the predominant mature tree line to ensure they are assimilated well into the existing environment.
- Building materials are reflective of place thereby ensuring that the proposal respects the character of the surrounding locality.
- The facades of the buildings have been designed to respond primarily to internal/external functions (connection with landscape, lifestyle spaces, daylight, indoor-outdoor connectivity) and also to integrate the buildings into the local context with a considered balance of bulk and scale.
- The roof set-outs and 'silhouette' design is informed largely by existing roof types in and around Yamba, with an emphasis on larger roof overhangs, lightweight materials and 'coastal' roof forms. All materials used will be consistent with those used in the surrounding area, with reflective or bright materials being avoided.

9.1.5 Consistency with the character of development in terms of Aesthetics

9.1.5.1 Existing Situation

The buildings on the site at present are largely functional and characteristic of tourist resorts and as such the buildings are largely constructed of timber and in the form of cabin style units. The surrounding buildings are varied in form and design and again are largely functional.

9.1.5.2 Potential Impacts

The design of buildings 1 and 2 respond to the character of the surrounding area. This includes:

- Building materials are 'reflective of place' and have been selected to consider the site's context in terms of appearance and proximity to the surrounding environments. The choice of materials was informed by the four different contexts influencing the site, namely the waterside (Clarence River, Urban (east end and Yamba), Land (south, Yamba Road and adjacent neighbourhood) and Nature (west, Nature Reserve);
- Balustrades are designed to provide unobstructed views from within all living spaces whilst providing some privacy from internal streets;
- The facades of the buildings have been designed to respond primarily to internal/external functions (connection with landscape, lifestyle spaces, daylight, indoor-outdoor connectivity) and also to integrate the buildings into the local context with a considered balance of bulk and scale;
- The roof set-outs and 'silhouette' design is informed largely by existing roof types in and around Yamba, with an emphasis on larger roof overhangs, lightweight materials and 'coastal' roof forms. All materials used will be consistent with those used in the surrounding area, with reflective or bright materials being avoided; and
- Careful landscaping of the site has optimised usability, privacy and social opportunity through the use of a range of native species, both coniferous and deciduous.

9.1.6 Consistency with the character of development in terms of Energy and Water Efficiency

9.1.6.1 Existing Situation

Given the nature and form of the existing uses and buildings on the site together with the length of time the structures have been in place, the incorporation of energy and water efficiency measures are minimal.

9.1.6.2 Potential Impacts

In order to optimise solar access, the living areas of Buildings 1 and 2 have been orientated to the north and are generously fenestrated. 84% of the units have either dual or triple aspect, whilst 84% of the units will have natural cross ventilation. The development will incorporate energy efficient appliances and hot water systems to minimise water consumption and maximise energy efficiency. Both buildings will achieve the recommended insulation ratings for walls, ceilings and roofs.

All roof water from the buildings will be drained by eaves gutters and down pipe system, which will be captured and directed to a localised rainwater harvesting system for re-use within apartments for toilet flushing

In addition, this water will be used as the primary water supply for landscape water elements and a low drip irrigation system.

9.1.7 Consistency with the character of development in terms of Safety

9.1.7.1 Existing Situation

At present, natural surveillance on the site occurs through its use and through the provision of communal open space. The site does however lack formal pedestrian and cycle pathways and this reduces safety. Although two entrances are provided at present, there are no formal pedestrian crossing points at Yamba Road.

9.1.7.2 Potential Impacts

- Two vehicular entrance points are proposed. This decreases the amount of traffic using the entrance/exit and thereby increasing safety.
- Median strips will be provided on Yamba Road to increase pedestrian safety.
- Additional formal pedestrian and cycle pathways will be provided on the site and this will reduce the conflict between vehicles and humans.
- Simple and clear circulation is provided in a safe environment, which will be further enhanced by the provision of way finding systems.
- Buildings 1 and 2 have been designed and orientated to maximise visual privacy between each building and on adjacent sites whilst enabling the passive surveillance of spaces within and surrounding the site.
- Passive surveillance will occur as a result of the fenestration of the buildings and the provision of communal open space.
- Casual overlooking and surveillance is afforded by the balcony design.
- The entrances to Building 1 and 2 will have secure access and perimeter surveillance of access. The entrances to the residential dwellings and the car parks will be well lit for safety and surveillance.
- Security devices will be installed to the pedestrian entrances to the dwellings and car parks entry, to control access to private spaces.
- Landscaping has been designed to provide privacy but also to ensure easy surveillance of the site.

9.1.8 Consideration of the provisions of Maclean Shires Council's DCP for Residential Development

The DG Requirements issued on the 19th October 2006, require consideration of the provisions of the Maclean Shires Council's DCP for Residential Development.

Notwithstanding the above, Clarence Valley Council adopted the Draft Clarence Valley DCP - Development in Residential Zones on the 18th October 2006. This document came into force on the 1st November 2006 and is therefore the relevant DCP applicable to the site.

The application has therefore been assessed against the provisions of the Clarence Valley DCP - Development in Residential Zones. The assessment is attached at Appendix 19.

9.2 Infrastructure Provision

9.2.1 Existing capacity and requirements of the development for sewerage in consultation with relevant agencies

9.2.1.1 Existing Environment

Sewer services are currently provided by North Coast Water and consist of a 150 diameter sewer mains, which also carried two current connection points to the site.

9.2.1.2 Potential Impacts

An Infrastructure Report prepared by Norman Disney Young stated that due to the proposed layout of the development, all on site drainage would require rectification and re-routing. Recommendation is made to disuse and replace the existing system with a new system designed to AS3500.2.

Discussions with North Coast Water concluded that the existing main and the volume available should be sufficient for the proposed development.

9.2.2 Existing capacity and requirements of the development for water in consultation with relevant agencies

9.2.2.1 Existing Situation

Potable water is currently supplied by North Coast Water. There are two water mains within Yamba Road, one of which carries three current connections points to the site at present.

9.2.2.2 Potential Impacts

An Infrastructure Report prepared by Norman Disney Young (NDY) concluded that the present water connection points will require further upgrades in size in order to meet the increased demand on the site.

Discussions with North Coast Water indicated that the existing main and the water volume available will be sufficient for the proposed development.

In terms of a potable water system, the local connection supply will use an existing connection point.

NDY confirm that cold water will be provided to the site through three dead leg systems, which will operate independently of each other. As a result of this, existing connection points to the authority's mains will be upsized as required. Hot water will be provided through a Gas hot water system. The report confirms that in terms of Stage 1 development, hot water will be provided by instantaneous gas units located in plant rooms. Hot water will reticulate from each unit to the fixtures in the apartment and a separate unit will be provided for each apartment. The Stage 1 buildings can therefore be operated independently of Stages 2 and 3.

9.2.3 Existing capacity and requirements of the development for electricity in consultation with relevant agencies

9.2.3.1 Existing Environment

The Infrastructure Report prepared by Norman Disney Young states that at present, the site is provided with three separate low voltage supplies from County Energy's local low voltage network (located on Yamba Road). It is understood that the load demand of the site at present is approximately 500kVA, which is below the projected maximum demand of the proposed development.

9.2.3.2 Potential Impacts

Based on discussions held by NDY with Country Energy, the total load (including the resort and residential facilities of Stage 1 and 2 together) cannot be supplied from Country Energy's low voltage network. NDY state that high voltage feeders will have to be installed from Country Energy's high voltage network and subsequently distributed by installing substations. NDY propose that 2 off 1500kVA substations be installed within the facility to supply the anticipated load. This will involve the installation of under ground high voltage cables from Yamba Road to the two substations. Drawing Ref. CP 103 illustrates the position of the sub station in the Stage 1 development.

9.2.4 Identify staging, if any, of infrastructure works

Stage 1 of the development has been designed to ensure that it can operate independently from the proposed Stage 2 and Stage 3 development phases and does not rely on the infrastructure works within the Stage 2 and 3 developments. In addition, Stage 1 has been designed to ensure that it can also operate whilst the existing caravan park is still in operation.

9.2.5 Address provision of public services and infrastructure having regard to the Council's Section 94 Contributions Plan.

A draft voluntary Planning Agreement having regard to the Council's Section 94 Contributions Plan is being prepared by the proponent in consultation with the Council. The notification of this draft voluntary Planning Agreement, prepared by Minter Ellison, is attached at **Appendix 6** and indicates as follows:

The proponent proposes to enter into a planning agreement under Subdivision 2 of Division 6 of Part 4 of the Environmental Planning and Assessment Act 1979, with Clarence Valley Council.

It is intended that the proposed planning agreement will provide for:

- *the grant of rights to allow the public limited access onto the Yamba Bay Foreshore Reserve, to the extent permitted by any relevant lease or licence of the Yamba Bay Foreshore Reserve;*
- *the carrying out of certain landscape works on the Yamba Bay Foreshore Reserve;*
- *the construction of certain roadworks on Yamba Road, including a roundabout at the intersection of Yamba Road and Shores Drive, Yamba, or alternatively, the provision of a capped monetary contribution to Clarence Valley Council,*

such contribution to be used by the Council to fund the carrying out of those roadworks; and

- *the provision of a monetary contribution to Clarence Valley Council such contribution to be used by the Council for the benefit of youth living or holidaying within Yamba.*

9.3 Integrated Water Cycle Management

9.3.1 Existing Environment

See **Section 7.4**.

9.3.2 Potential Impacts

Integrated Water Cycle Management (IWCM) is the integrated management of the water supply, sewerage and stormwater services within the 'whole of catchment strategic framework' and provides a long term focus on the integrated delivery of these services.

IWCM is a way of managing water in which all components of the system are integrated so that water is used optimally.

The proposal supports the adoption and implementation of integrated strategies and promotes the conservation of drinking water and the more efficient and effective re-use of stormwater and wastewater resources to reduce the use of high quality drinkable water for purposes which only require a lower quality of water.

The following non-potable water supplies will be provided:

- *Rainwater – will be harvested from the roofs of all buildings via gutter, rainwater outlets, down pipes, with a first flush water treatment system to remove debris and pollutants from the roof;*

- *Stormwater – due to the high permeability of the sandy soils, it is expected that overland flow is only likely to occur during peak rainfall events, therefore it is not likely to be able to contribute to the water re-use volume.*

- *Treated Wastewater – Clarence Valley Council is currently considering the provision of a treated wastewater supply via dual reticulation to the area. The development will be designed such that if a treated wastewater supply becomes available in the future then a connection to the existing systems can be retro fitted.*

The non-potable water demand is calculated on the assumption that the development experiences near full capacity (90%) during the summer months from October – April, dropping to around 60% occupancy in the winter months (May – September).

Water balance calculations have been carried out to ascertain the appropriate rainwater storage volume to meet the residential water demands, tourist facility water demands and landscaping requirements. These calculations are at Appendix E of the Report on Sustainable Water Management.

The water balance model was developed to consider the effects of the proposal on the Clarence Estuary and consequently, any impacts of the Clarence Estuary on the proposal. The major considerations are:

- *Evaporation- high evaporation rates in the locality will require management of water use to minimise loss;*
- *Environmental flows- limit detention of natural runoff to ensure downstream flows are not affected ;*
- *Lagoon function- maintain minimum water levels to function efficiently;*
- *Re-use water loss – prevention of loss of water stored for –reuse (during times of low use)*

Table 6.5 of the Report presents the expected water demand per person for an average dwelling, with estimations of the potential water savings by introducing water efficient design. The table confirms that the proposal conforms with the required 40% reduction in potable water consumption. Further, 100% irrigation demand is achievable.

Individual elements of the Integrated Water Cycle Management strategy (including stormwater) are assessed in the following sections 9.3-9.4.

9.3.3 Conclusion and Mitigating Measures

The proposal implements Integrated Water Cycle Management through:

- improved water use efficiency;
- less waste;
- environmental sustainability; and
- providing a secure and reliable supply to meet social and economic needs.

The Report on Sustainable Water Management concludes:

> *The design of the non-potable water harvest, storage and supply system and specification of water efficient landscaping and hydraulic fixtures and fittings greatly reduces the water consumption of the residential properties compared to average dwelling design.*

The objective of integration is the management and combination of all these outcomes as part of a whole, so as to provide better outcomes than would be expected by managing the parts independently.

The proposal is therefore consistent with Integrated Water Cycle Management.

In relation to water reuse storage volumes, the Report provides:

> *The following storage tank volumes are optimal for reuse, based on average weather data. In times of extreme weather events, irrigation water may be topped up from the potable supply as necessary:*
>
> - *Residential: 100m^3*
> - *Tourist Facilities: 70m^3*
>
> *For Stage 1, an underground tank of 100m3 will provide all toilet flushing and irrigation demands.*

9.4 Stormwater

9.4.1 Existing Environment

The site is generally flat with a slight fall from north-west (RL 2.0) to south-east (RL1.4m). Yamba Road forms a high point with stormwater falling north-east to the Clarence Estuary. Stormwater is currently managed by directing the site surface flows to a series of stormwater pits, pipes and open drains.

A Stormwater Assessment has been undertaken as part of the Report on Sustainable Water Management, prepared by ACOR Consultants (Appendix 18). The Assessment provides:

> *Generally stormwater flows to the north-west towards a formed drain along the north western boundary…One small diameter Upvc pipe drains directly to the estuary.*
>
> *The open drain along the north eastern boundary runs to the Clarence River.*

The existing stormwater services plan is included at Appendix B of the Report on Sustainable Water Management.

9.4.2 Potential Impacts

Hard stand areas have the potential to increase overland flow during peak rainfall events. The design minimises the use of hardstand areas and maximises the area of landscaping. The Report provides:

Stormwater falling on hard surfaces will be diverted to the drainage system, which mimics the natural flow of the site.

Stormwater will be treated in a Gross Pollutant Trap (GPT) to improve water quality prior to release to the environment.

It is proposed to discharge to the estuary via the existing stormwater outlet locations with appropriate scour protection and landscape treatments added to improve the functionality an amenity of each outlet:

- *Outlet 1 drains to the estuary adjacent to the existing jetty structure. It is proposed to demolish and reconstruct this outlet to incorporate it into the abutment of the existing jetty structure.*

In relation to roof water:

All roof water will be directed to rainwater reuse tanks adjacent to the basements from where the water will be reticulated for use within the building….excess run-off will surcharge from the reuse tanks and into the site storm water drainage system.

The proposed stormwater and water re-use cycle is described in the Concept Stormwater Management and Reuse Plan at Appendix A of the Report on Sustainable Water Management.

9.4.3 Conclusion and Mitigation Measures

Stormwater drainage will be designed in accordance with the Water Sensitive Urban Design (WSUD) principles. Stormwater runoff from all landscaped and road way areas will be drained to the proposed piped stormwater drainage system. This system will include gross pollutant traps prior to all outlets.

All proposed stormwater works will generally conform to the requirements set out in the Maclean Stormwater Drainage Design Handbook and by the Clarence Valley Council Sustainable Water DCP. This DCP requires that building design and site management must adopt practices that are complementary to the operation of the natural water cycle and water sustainability.

9.5 Noise and Acoustics

9.5.1 Existing Environment

The site currently operates as a resort and caravan park with on-site cabins, a general store, petrol station and supporting recreational facilities including a tennis court and swimming pool.

To the north, the site is bound by the Clarence River and foreshores; to the east, the Moby Dick Motel and commercial premises; to the west, the Clarence Estuary Nature Reserve; and to the south, on the southern side of Yamba Road, are residential

properties. These properties are a mix of single and two storey residences generally setback 8m from Yamba road.

A Noise Impact Assessment has been prepared by Norman Disney and Young (Appendix 23). The Assessment quantified background noise levels and estimated noise levels at three representative receivers, namely:

- Location A – 114 Yamba Road (across the site from existing car park entrance);
- Location B – across the site from the proposed western car park entrance; and
- Location C – the Moby Dick Motel (to the east of the site).

Background noise monitoring was conducted at 'Location A' (114 Yamba Road), approximately 30m from the existing eastern entrance to the site. The monitoring provides:

> *Noise from the site is largely dominated by traffic noise along Yamba Road, a two-lane sub-arterial road which is the main access route into Yamba township.*

9.5.2 Potential Impacts

Norman Disney and Young have prepared a Noise Impact Assessment which assesses the construction, operating and traffic noise impacts of the proposal (Appendix 23). The proposal includes tourist accommodation units on the western portion of the site and residential units on the eastern portion of the site. These facilities will be supported by swimming pools, spas and tennis courts.

The NSW Industrial Noise Policy[2] (INP) is specifically aimed at assessing noise from industrial noise sources, scheduled under the Protection of the Environment Operations Act 1997. While the INP is not strictly applicable to this site, and the site is not a scheduled premise, the Assessment uses these guidelines to determine whether the level of noise would be considered offensive.

The INP requires the assessment of two criteria to determine the appropriate project specific criteria:

- Intrusive criteria; and
- Amenity criteria.

For the purposes of assessing potential noise impacts in relation to construction and operational noise, the intrusive criteria and amenity criteria are identified at Section 4.1.1 and 4.1.2 of the Noise Impact Assessment and reproduced below in Table 9.1 and Table 9.2:

[2] Environment Protection Authority, 2000

Table 9.1 Intrusive Criteria

Time of Day	*Rating Background Level*	*Intrusive Criteria*
Day (0700-1800)	*49*	*54*
Evening (1800-2200)	*38*	*43*
Night (2200-0700)	*35*	*40*

Table 9.2 Amenity Criteria

Time of Day	*Project Specific Criteria*
Day (0700-1800)	*53*
Evening (1800-2200)	*43*
Night (2200-0700)	*40*

Following the establishment of the Intrusive and Amenity Criteria, the Project Specific Criteria (the most stringent of the two criteria) is listed at Table 4 of the Noise Impact Assessment and reproduced below:

Table 9.3 Project Specific Noise Criteria

Time of Day	*Amenity Criteria*
Day (0700-1800)	*54*
Evening (1800-2200)	*43*
Night (2200-0700)	*40*

In consideration of wind effects, the Noise Impact Assessment provides:

> *Overall, the seasonal occurrence of winds in the source to receiver component wind speeds 3m/s or less does not occur more than 30 percent of the time. We have therefore not considered wind any further for noise prediction calculations in this assessment.*

Construction

The site requires earthworks, construction of basement car parking, extension of hardstand areas (including roads and visitor parking) and the erection of two residential flat buildings some fixed plant and equipment, offices and laboratories. Excavation will be required for basement car parking, footings, foundations and service trenches.

Construction would be expected to be completed within 18 months and will be carried out during normal construction hours, in accordance with the Department of Environment and Conservation's Environmental Noise Control Guidelines.

Road Traffic Noise

The *Environmental Criteria for Road Traffic Noise (ECRTN),* prepared by the Environment Protection Authority (1999), provides a framework that guides the consideration and management of traffic noise issues associated with new developments near existing or new roads and new or upgraded road developments adjacent to new or planned building development. The framework embodies a non-mandatory performance –based approach.

In accordance with the above policy document and where development has the potential to create additional traffic on an existing freeways/arterial road[3], the Noise Impact Assessment defines the recommended noise criteria as:

- *Daytime Leq(1hr) = 60dB(A); and*
- *Night-time Leq(1hr) = 55 dB(A).*

The ECRTN provides

> *In all cases, the redevelopment should be designed so as not to increase existing noise levels by more than 2dB*

The Traffic Report (Appendix 14) forecast a minor decrease in traffic movement levels (see Section 7.2 for further details). This is correlated in Table 6 to the Noise Impact Assessment and reproduced below.

Table 9.4. Predicted change to traffic noise, Holiday AM peak Hour – Yamba Rd, Two Way, dB(A)

Location	***Existing Traffic***	***Forecast Traffic***	***Change Leq***
Shores Drive and Caravan Park	*1038*	*960*	*-0.3*

Table 9.5. Predicted change to traffic noise, Holiday PM peak Hour – Yamba Rd, Two Way, dB(A)

Location	***Existing Traffic***	***Forecast Traffic***	***Change Leq***
Shores Drive and Caravan Park	*968*	*960*	*-0.1*

Subsequently, the Noise Impact Assessment concludes:

> *Calculated increases in traffic noise levels indicate a minor decrease in traffic noise for both morning and evening periods.*

For the purposes of assessing potential noise impacts in relation to car site entry and exit the following the Noise Impact Assessment provides:

[3] **Redevelop existing freeway/arterial** refers to an existing freeway, arterial or sub-arterial corridor where it is proposed to increase traffic-carrying capacity, change the traffic mix or change the road alignment through design or engineering changes.

Location	***Existing Leq,1hrTraffic***	***Predicted Noise Level***
A	*64*	*61*
B	*64*	*64*

Therefore:

> *Calculated noise levels do not exceed the existing Leq,1hr by more than 2dB(A) and therefore complies with the ECRTN*

Operating Noise (Mechanical Plant)

It is proposed that each of the units will be serviced with a rooftop mounted air conditioning unit, with a manufacturer sound pressure level of 57dB(A) at 1m. The Noise Impact Assessment predicted noise levels to comply with the project specific criteria, as shown in Table 10 of the Assessment and reproduced below:

Location	Period	Project Specific Criteria	Predicted Noise Level
A	Night (2200-700)	40	34
B	Night (2200-700)	40	33
C	Night (2200-700)	40	36

Recreational Noise

Potential recreational noise sources include activities associated with the tennis courts and swimming pools. The closest offsite residential receiver is located between 150 to 250m from the site. The Noise Impact Assessment concludes:

> *The proposed building configuration with buildings along Yamba Road provides additional shielding to residences from on-site recreational activity. Calculated noise levels of tennis matches such as hitting balls, talking between points and calling out after points (Lw = 77dB(A)), was calculated at Location A, B and C to range from 17 to 24 dB(A). Noise impacts associated with tennis are likely to have minimal impact at these locations.*

9.5.3 Conclusion and Mitigation Measures

In all cases, the application of both the INP Intrusive Noise Impact Assessment and Environmental Criteria for Road Traffic Noise resulted in intrusive levels below the relevant residential assessment criteria and any noise impacts were considered acceptable. Therefore no mitigating measures are proposed.

In relation to construction noise, impacts will be controlled through compliance with the requirements set out in Chapter 171 of the EPA Environmental Noise Control Guidelines.

9.6 Flooding

9.6.1 Existing environment

The site adjoins the southern foreshores of the Clarence River, approximately 2km from the opening of the Clarence River to the Pacific Ocean. For this reason, the site is subject to flooding due to the effects of the Clarence River peak flows coinciding with tidal surges.

Existing floor levels on the site vary between RL 2.4 and 2.7m approximately.

A Report on Sustainable Water Management has been prepared by ACOR (Appendix 18). The Report defines the variation over time of flood levels, extent and velocity for flood events of various severities, up to and including the PMF.

Figures 1-8 in Appendix C of the Report on Sustainable Water Management indicate the 1:5, 1:20, 1:100 and PMF floods over the site:

- *At 0.90-1.00m AHD, the 1:5 Flood with velocity <0.10m/s affects a small portion of the site, along the north-western corner;*
- *At 1.80-1.90m AHD, the 1:20 Flood with velocity <0.10m/s affects the majority of the site, with the exception of two small areas along Yamba Road;*
- *At 2.30-2.40m AHD, the 1:100 Flood with velocity <0.10m/s affects the entire site; and*
- *At 3.30-3.60m AHD, the PMF Flood with velocity 0.10-0.20m/s affects the entire site.*

9.6.2 Potential Impacts

Whilst the existing site is subject to flooding due to the effects of the Clarence River peak flows coinciding with a tidal surge, the Report on Sustainable Water Management provides:

> *The site does not flood due to local catchment flows.*

However, redevelopment has the potential to impact upon flood behaviour (levels, flows and flowpaths) and therefore the flood exposure of other properties. Impacts can be due to:

- Blocking by fill of, or buildings on, floodways;
- Removing area for flood storage within the floodplain, due to filling or levees; and

- Increasing the amount of impervious area in a catchment which, without appropriate management, increase the overall volume and peak runoff from the area.

The NSW Floodplain Development Manual (FDM) was prepared by the Department of Infrastructure Planning and Natural Resources in 2005 with the primary objective *'to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods'*.

The FDM acknowledges a broad risk management hierarchy of:

- *avoidance of flood risk;*
- *minimisation of flood risk; and*
- *flood risk mitigation.*

In relation to the FDM, the Report provides:

> *During a flood event water will rise and fall from the estuary. The development will not impede flood flows but will reduce available flood storage volumes. Due to the significant area of the extent of flooding within the flood plain and the proximity to the ocean the effect of reduced flood storage will be insignificant. As such loss of flood plain storage due to the development is not a concern.*

Clause 11(2) of the Mclean LEP 2001 provides:

> *Consent must not be granted to the erection of a dwelling on flood liable land unless the floor level of the living accommodation of the dwelling is located:*
>
> *b) in the case of land within Zone No 2 (a), 2 (b), 2 (t), 3 (a) or 4 (a) that is within the town of Iluka or Yamba, at least 0.3 metre above the 1 in 100 year flood level adopted by the Council.*

The 1 in 100 year AEP flood event level for the site is in the range of 2.3 to 2.4m AHD. Minimum floor levels have been set at as RL 2.7m. and therefore comply with the requirements of Clause 11(2). This allows for a freeboard of 360mm above the 1 in 100 year ARI flood level. Building basements are to be effectively "flood proofed" by raising entry levels to at least RL 2.7m AHD around all building entries.

In relation to the extent of the flood hazard:

> *…the development is located within an area designated as low velocity. Velocity has been predicted as 0.1m/s. Depths of flooding will vary from 0 to 800 maximum. As such the velocity depth product will be in the range of 0 to 0.1m.m.s and hence the flood hazard is considered to be classified as low.*

The impact of the proposal including the cumulative effect of the Yamba bypass on flooding has also been assessed. The Report concludes:

> *…that the filling of the Blue Dolphin Caravan Park Site independently had a non worsening effect of flood levels, based on the 100 year and 20 year ARI modelling results. Similarly, results show the combined filling of the Blue Dolphin Caravan Park with the neighbouring development in West Yamba reduces the minor impacts resulting from West Yamba development.*

In terms of the impact on adjoining properties in terms of stormwater drainage, the Report concludes:

> *"The development will effectively act as a levee along the Clarence River estuary boundary which will reduce the negative effects of flooding on the development itself and the surrounding residential areas immediately to the south of the development by slowing the inundation of flood waters to these areas."*

9.6.3 Conclusion and Mitigation Measures

Clarence Valley Council currently have in place a flood warning plan for the Clarence Valley that warns residents of the ensuing flood as it travels from the upper reaches of the Clarence towards the site. In addition to this existing mitigation measure, the Report recommends:

- *a site evacuation plan in the event of flooding is incorporated into the Community Management Statement that coordinates with councils flood warning plan to ensure residents of this development are fully warned of ensuing rising of flood waters.*

ACOR have liaised with Council in relation the impact of flooding on the proposed redevelopment and have concluded that *"the development will effectively act as a levee along the Clarence River estuary boundary which will reduce the negative effects of flooding on the development itself and the surrounding residential areas immediately to the south of the development by slowing the inundation of flood waters to these areas"*.

10 JUSTIFICATION AND CONCLUSION

The proposal is consistent with the intentions of the **North Coast Regional Environmental Plan** and will assist in supporting the economic growth and development of the area. It is considered that the information provided in the proposed concept plan allows the Minister to be reasonably *"satisfied that the density of the dwellings have been maximised without adversely affecting the environmental features of the land"* as required by the **North Coast REP** when determining development for residential purposes.

The proposal is consistent with the intentions of the Clarence Valley Council, under the direction of **the MacLean Local Environmental Plan**, adopted in 2001 and achieves the core objectives of the instrument. In particular, the subject site has been identified in **the LEP, through** the zoning provisions for the Residential Tourist zone as a location appropriate for the development of "*tourist facilities, recreation facilities and high density residential development and associated uses*". The concept plan complies with the provisions of the LEP. The application does not preclude or prejudice any future action that would ensure compliance with the provisions of the LEP.

The concept plan will provide new stock of tourist accommodation and assist to accommodate the increase in demand for high quality residential housing, presently not available in the Lower Clarence Area.

The proposed introduction of permanent residential accommodation on to the site is likely to result in greater numbers of residents on the site. However due to the reduction in the capacity of holiday accommodation on site, the capacity of the site during peak holiday periods will be reduced.

The proposed provision of a mix of residential units will cater for different household requirements now and in the future. The development will increase housing choice within Yamba.

The Concept Plan incorporates "*higher density residential development*" which has the potential to achieve more efficient use of land. In accommodating greater amounts of residential growth in comparison to lower density development options, the proposal minimises the take up of land elsewhere in Yamba, where environmental opportunities such as the retention of threatened species exist. This has the potential to reduce the ecological footprint of development in the locality.

The proposed development has been designed to ensure that quality accommodation is being provided which respects the existing character and form of the area. This has been achieved through careful orientation of building, setbacks, a variety of building heights and careful landscaping. This will therefore result in the provision of quality accommodation currently lacking in Yamba, whilst also generating significant economic benefits both during the development phase and the operational phase of the project.

In addition, the use of height to accommodate the density of the site reduces the overall site coverage of the proposal, providing greater opportunities for increased planting of native species on the site and the accommodation of overland flow paths to provide drainage management.

The potential environmental impacts identified at **Sections 7, 8 and 9** of this report, are able to be effectively ameliorated by the mitigation measures recommended within the various consultant reports that have informed this report and are incorporated into the statement of commitments. This report concludes that the proposed concept plan is not likely to result in any significant adverse impacts.

It is considered that the concept plan contemplates a form of development that will achieve the objects of the EP&A Act. In particular, the proposal represents "*orderly and economic use and development of land*" and provides the opportunity for "*the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and … ecologically sustainable development…*".

It is therefore recommended that the application is determined by the granting of concept plan approval, and approval under **Section 75P(1)(c)** of the EP&A Act for the community title subdivision, Stage 1 of the concept plan and strata subdivision of Stage 1 of the concept plan.