Fern Bay Seaside Village

Environmental Assessment

Volume 1

Fern Bay Seaside Village

Environmental Assessment

for Aspen Group Pty Ltd

February 2009

0063154

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Delivering sustainable solutions in a more competitive world

Fern Bay Seaside Village

Environmental Assessment

for
Aspen Group Pty Ltd

February 2009

Project No. 0063154

Project Manager:	*Amanda Antcliff*
Signed:	
Date:	*February 2009*
Partner:	*Paul Douglass*
	
Date:	*February 2009*

Environmental Resources Management Australia Pty Ltd Quality System

SUBMISSION OF ENVIRONMENTAL ASSESSMENT REPORT

PREPARED UNDER THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 - SECTION 75

EA PREPARED BY

Names: Paul Douglass

Qualifications: BTP (UNSW)
MEnvSt (U of N)

Address: 53 Bonville Avenue, THORNTON NSW, 2322

PROPOSED DEVELOPMENT

Project approval is sought for a 682 residential subdivision at Fern Bay, including 4 integrated housing lots with a potential lot yield of 84 lots. The estate will be constructed over fifteen stages (development of the first three stages comprising 182 lots has already been granted) and ultimately comprise approximately 945 residential lots, recreational and community facilities, services, roads, fire trails and pathways as well as open space areas comprising a cultural heritage reserve, asset protection zones, managed reserves and bushland open space.

PROJECT APPLICATION

Applicant Name: Aspen Group Pty Ltd

Applicant Address: Level 5, 33 York Street, Sydney, NSW 2000

Land to be developed: Lots 3, 4 and 5 in DP 270466, Fern Bay

ENVIRONMENTAL ASSESSMENT

An Environmental Assessment (EA) is attached.

CERTIFICATE

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

- *it is in accordance with Section 75 of the EP&A Act and the Director Generals Requirements (DGRs);*
- *it contains all available information that is relevant to the environmental assessment of the development to which this statement relates; and*
- *it is true in all material particulars and does not, by its presentation or omission of information, materially mislead.*

Name: Paul Douglass

Signature: 

Date: 11 February 2009

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EXECUTIVE SUMMARY

This Environmental Assessment Report (EAR) has been prepared by Environmental Resources Management Australia Pty Limited (ERM) on behalf of Aspen Group Limited pursuant to Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A). It has been prepared to accompany the application for project approval for a proposed residential subdivision known as Fern Bay Seaside Village located at Lots 3, 4 and 5, DP 270466, Nelson Bay Road, Fern Bay. The proposal is consistent with the Master Plan for the site which was approved by the Minister of Planning on 8 August 2006.

The objective of the proposed development is to create a seaside village nestled within a natural setting that sets a new benchmark in the Hunter Region for quality and innovation in the standard of urban design, construction and environmental management.

Fern Bay Seaside Village is proposed to comprise:

- *approximately 683 residential lots with an existing valid development consent enabling the creation of an additional 182 lots (149 of which have been completed). The proposal also includes 4 lots (of the 683) with the potential for further subdivision into 84 integrated housing lots. This will take the total number of lots to 945. The Master Plan provides approval for approximately 947 lots.*
- *open space lots which will include formal parks, a Cultural Heritage Reserve, asset protection zones, managed reserves and bushland open space. These areas of open space are designed to provide opportunities for passive and active recreation, stormwater management and the protection of sites both for Aboriginal heritage significance and ecological corridors;*
- *recreational and community facilities;*
- *new public roads, fire trails and pathways; and*
- *bush fire buffers (asset protection zones) and approved fire trails.*

A general environmental risk analysis was undertaken for the proposal in accordance with the Director-General's requirement. This identified the following key environmental, social and economic issues as relevant to the development:

- ***Bush Fire Risk:** ERM prepared a Bush Fire Risk Assessment, which recommends mitigation measures to be incorporated into the development. These include Asset Protection Zones, perimeter road or fire trails, requirements for hydrants provisions and levels of construction for individual lots;*
- ***Traffic and Access:** ERM prepared a Traffic Assessment Report. The report concluded that the increase in traffic does not pose a significant impact on the external network. Pedestrians and cyclists are catered for within the road and pathways network of the site;*
- ***Vegetation Management Plan**: The Fern Bay Community Lands Environmental Management Plan aims to enhance and protect native vegetation*

and fauna habitat through regeneration, reconstructive landscaping and maintenance of natural areas;

- ***Social Economic Impacts:*** *The proposed subdivision provides increased housing choice within the Port Stephens Local Government Area and will not result in significant impacts to existing community facilities. Discussions are currently being held with Port Stephens Council and Newcastle City Council to ensure proper consideration is given to the local recreation and community needs;*

- ***Species Impact Assessment:*** *The development strategically conserves 107 hectares of habitat for affected species and communities including a minimum 200 metre wide ecological corridor;*

- ***Ecological Assessment Report:*** *No local population of threatened or migratory species listed in the EPBC Act is likely to be significantly impacted by the proposed subdivision;*

- ***Aboriginal Heritage Assessment Report:*** *The assessment report includes recommendations for the management of Aboriginal heritage within the site. Those recommendation have influenced the design of the subdivision and will affect how construction will be managed;*

- ***Noise Assessment Report:*** *The 200 metre setback from the site's boundary with Nelson Bay Road assures the proposed subdivision can proceed without any adverse noise impacts; and*

- ***Assessment of Coastal Hazards and Dune Stability****: The report recommends that an area of 200 metres inland of the seaward face of the frontal dune be allocated to provide a buffer for coastal hazards, including beach recession, storm serge and long term climate change.*

Each issue has been addressed and adhered to in the preparation of the approved Master Plan.

Through the assessment of the Master Plan application negotiations were held with the then DEC to investigate the potential for an offset compensation package on the adjoining Worimi Regional Park. A Vegetation Management Plan (VMP) has been prepared and submitted to DECC, which outlines measures to improve the condition of wet heath and overall management of the land by removing identified waste and weed occurrences and regenerating or restricting access to certain tracks. The rehabilitation potential, monitoring requirements, timeframe for works and review of rehabilitation success were outlined as part of the VMP. The VMP aims to offset the loss of wet heath in the Fern Bay Seaside Village by improving the condition of neighbouring wet heath.

The land at Fern Bay has been zoned for residential use for more that 10 years. All the major service providers have been aware that the land will be developed for residential use. During the first and second stages of development all the essential services have been installed in accordance with the relevant agencies.

1 INTRODUCTION

1.1 GENERAL

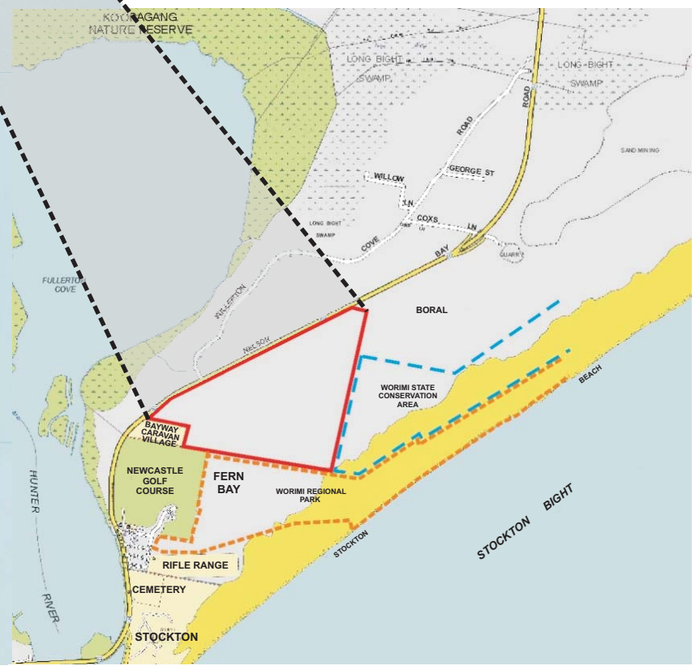
This Environmental Assessment Report (EAR) has been prepared by Environmental Resources Management Australia Pty Ltd (ERM) on behalf of the Aspen Group Pty Ltd pursuant to Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The report has been prepared to accompany the application for project approval for a residential subdivision consisting of 683 lots called 'Fern Bay Seaside Village' at Fern Bay *(*see *Figure 1.1).*

The NSW Minister of Planning approved a Master Plan for the proposal pursuant to State Environmental Planning Policy No.71 – Coastal Protection on 8 August 2006. The first stage of the subdivision was approved by the Land and Environment Court in 1997 and is currently under construction.

This report describes the proposal and the environmental implications associated with the key issues for the site. The structure of the report is as follows:

- *Chapter 2* describes the proposal, including staging;
- *Chapter 3* provides a description of the site and context and surrounds;
- *Chapter 4* outlines the design principles adopted for the development;
- *Chapter 5* provides an outline of the planning requirements that apply to the development;
- *Chapter 6* provides a general Environmental Risk Assessment;
- *Chapter 7* describes the assessment of key issues, including environmental and social assessment;
- *Chapter 8* provides a justification for the project;
- *Chapter 9* outlines the draft Statement of Commitments for the project; and
- *Chapter 10* provides a conclusion for the EA Report.

The Director-General's Requirements (DGRs) for the preparation of this EA are provided in *Annex A*. A summary of the key issues raised in the DGRs, as well as the relevant section of the EA where they are addressed, is provided in *Table 1.1*.



Legend

Fern Bay Seaside Village

Figure 1.1

Locality Plan

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_10		
Date:	10/2/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	-		
Scale:	Not to Scale		

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Table 1.1 Director-General's Requirements

Key Issues	Relevant Section in EA
General Requirements:	
• an executive summary	Executive Summary
• an outline of the project	Section 2.1
• any development options;	Section 2.8
• justification for the project taking into consideration any environmental impacts of the project, the suitability of the site and whether the project is in the public interest;	Section 2.9 and Chapter 8
• outline of the staged implementation of the project if applicable;	Chapter 2.7
• a thorough site analysis and description of the existing environment;	Section 2.10
• consideration of any relevant statutory and non-statutory provisions and identification of any non-compliances with such provisions, in particular relevant provisions arising from environmental planning instruments, regional Strategies (including draft Regional Strategies) and Development Control Plans as well as impacts, if any, on matters of national environmental significance under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999;	Chapter 5
• where relevant, demonstrate compliance with BCA and relevant Australian Standards for proposed building, traffic road and parking; utilities; noise and flooding	Section 2.6
• an environmental risk analysis of the project including consideration of the issues raised during consultation;	Chapter 6
• an assessment of the potential impacts of the project and a draft Statement of Commitments, outlining environmental management, mitigation and monitoring measures to be implemented to minimise any potential impacts of the project;	Chapters 7 and 9
• the plans and documents outlined in Attachment 2;	Annex B
• a signed statement from the author of the Environmental Assessment certifying that the information contained in the report is neither false nor misleading; and	Inside front cover
• an assessment of the key issues specified below and a table outlining how these key issues have been addressed.	Entire report and Table 1.1.
The Environmental Assessment must address the following key issues:	
1. General consistency with the Approved Master Plan.	Sections 2.4, and 7.1, Annex C
1.1 The project application must be generally consistent with the Master Plan No. MP 20-4-2005 for the site, approved by the Minister for Planning on 8 August 2006.	Sections 2.4 and 7.1
2. Design and Visual Impacts	Section 4.7, Chapters 2 and 7
2.1 Demonstrate suitability of the proposal with the surrounding area in relation to the potential character, bulk, scale and visual amenity of development resulting from the subdivision having regards to the Coastal Design Guidelines of NSW (2003), NSW Coastal Policy (1997) State Environmental Planning Policy No 71 – Coastal Considerations (specifically Clause 2 and 8), Port Stephens Local Environmental Plan 2000 and other relevant Development Control Plans. Confirm that the proposal is consistent with the Lower Hunter Regional Strategy.	Chapters 4, 5 and 7

	Key Issues	Relevant Section in EA
2.2	Identify the extent of potential development footprints, building envelopes and built form controls and any significant trees to be removed.	Chapter 2, Section 4
2.3	Address safety; provision of public reserves; potential perimeter road layout; pedestrian and bicycle movement to, within and through the site.	Chapter 4, Section 7.5
2.4	Provide details of the formalisation of dune/beach access from site, generally consistent the Master Plan.	Section 7.4.2
3.	Social and Community	Section 7.3
3.1	Address the social and economic context to the development in terms of infrastructure requirements, access, public transport, community services and facilities, having regard to Council's Section 94 Contributions Plan-Plan District No 8 Fern Bay.	Section 7.4
4.	Traffic and Access	Section 7.5
4.1	Provide a Traffic Impact Study in accordance with the RTA Guide to Traffic Generating Developments and in consideration of SEPP 11.	Annex M
4.2	Identify all relevant vehicular traffic routes and intersection and anticipated vehicular traffic generated from the proposed lots.	Annex M
4.3	Provide current traffic counts for all of the above traffic routes and intersections and anticipated vehicular traffic generated from the proposed lots.	Annex M
4.4	Provide a traffic analysis, using SIDRA or similar traffic model, for relevant intersections including; current and traffic growth projections for the life of the project; 95th percentile back of queue length; and delay level of service on all legs.	Annex M
4.5	Consider traffic impact on the existing intersections and the capacity of MR108 (Nelson Bay Road) to safely and efficiently cater for the additional vehicular traffic generated.	Annex M
5.	Infrastructure Provision	Section 7.6
5.1	Address existing capacity and requirements of the proposal for effluent disposal, water supply, electricity, and telecommunication services. Identify staging, if any, of infrastructure works. Consider the feasibility of implementing a greywater reuse system within the development.	Chapter 7, Section 7.6.1
6.	Flora and Fauna	Section 7.7,Annexures H, P, Q and R
6.1	Outline measures for the conservation of flora and fauna and their habitats within the meaning of the Threatened Species Conservation Act 1995, having regards to the Draft Guidelines for Threatened Species Assessment (DEC and DPI July 2005). Measures should generally be in accordance with the approved Master Plan.	Section 7.7
6.2	Address the requirements of the State Environmental Planning Policy No 44 – Koala Habitat Protection and the Port Stephens Comprehensive Koala Plan of Management.	Section 7.7
6.3	Assess the impact of the proposal on groundwater dependent ecosystems (swamp forest and wet heath), and assess the need for appropriate buffer zone(s) to be placed around ground water dependent ecosystems.	Section 7.7, Section 7.9 and Annexures P,R and S
7.	Impacts on Adjoining Lands	Section 7.8
7.1	Describe mitigation and management options that will be used to prevent, control, abate or minimise identified impacts on	Section 7.8 and Chapter 7

	Key Issues	Relevant Section in EA
	Department of Environment and Conservation (DEC) estate, Asset Protection Zones proposed for the development should not impact on adjacent land managed by DEC.	
7.2	Address impacts of dense residential development on neighbouring sand extraction operations. Address impacts of neighbouring sand extraction operation on the proposed residential development.	Section 7.8
8.	Water Cycle Management	Section 7.9 and Annex S
8.1	Demonstrate the development will not exacerbate local flooding and is designed in expectation of flooding. Demonstrate compatibility with Port Stephens Council Flood Policy and in accordance with the guidelines contained in NSW Floodplain Development Manual (2005). Implication of climate change on flooding should be considered.	Section 7.9
8.2	Address drainage issues associated with the changes in the hydrological regime of the catchment. Provide a stormwater plan for the subdivision layout (based in best practise management of stormwater and incorporating Water Sensitive Urban Design Principles).	Section 7.9 and Annex S
8.3	Address potential impacts on water quality of surface and groundwater (during construction and occupation of the site), into adjoining lands and downstream, having regard to the Groundwater Assessment Standard Requirement of State Significant Developments/Major Developments within a Municipal Water Supply Catchment (DNR, 2006) and the principles of the NSW State Groundwater Policy Framework. Provide a Groundwater Study, which includes a Geotechnical site assessment as per Australian Standard (AS 2870).	Section 7.9 and Annex S
9.	Coastal Zone Management	Section 7.10
9.1	Address potential landward movement of transgressive dunes towards the development, having regard for coastal and mobile Dune Hazard Lines outlined in Figure 7.3, Part D of the Stockton Bight Environmental Study and Management Plan prepared by HLA Envirosciences Pty Ltd (August 1995). Ensure the development is setback behind the 1 in 100 year hazard line. Mitigation or dune restoration/stabilisation measures should also be considered.	Section 7.10 and Annex K
9.2	Address the predicted increase in water level as a result of sea level rise.	Section 7.11
10.	Bush Fire	Section 7.12
10.1	Address the requirements of Planning for Bushfire Protection 2001 (RFS), in particular asset protection zones, adequacy of water supply for bush fire suppression operations and future management of any areas of hazard remaining, including natural areas of buffers zones.	Section 7.12
11.	Cultural Heritage	Section 7.13
11.1	Address the document information contained in Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005). Demonstrate that effective consultation with Aboriginal communities has been undertaken in determining and assessing the impacts, developing options and making final recommendations.	Section 7.13
12.	Acid Sulfate Soils and Contaminated Land	Section 7.14 and Annex T

Key Issues	Relevant Section in EA
12.1 Identify the presence and extent of acid sulfate soils on the site and outline appropriate mitigation measures. Identify areas of contamination on site and appropriate mitigation measures. The level of assessment shall be consistent with the Acid Sulfate Soil Manual by ASSMAC.	Section 7.14 and Annex T
Consultation	
An appropriate and justified level of consultation with the following agencies during the preparation of the EA:	Section 7. 16
(a) Agencies or other authorities: • Port Stephens Council; • NSW Department of Planning – Hunter Region; • Department of Environment and Conservation; • NSW Department of Education; • NSW Department of Health; • NSW Department of Primary Industries; • NSW Police Service; • NSW Rural Fire Service; • NSW Road and Traffic Authority; • Hunter Water Corporation; • Relevant Aboriginal Land Council	
(b) Public: • Document all community consultation undertaken to date or discuss the proposed strategy for undertaking community consultation. This should include any contingencies for addressing any issues arising from the community consultation and an effective communications strategy.	Section 7.15
Plans and Documents to accompany the Application	
Project Plan	
1. Locality Plan	Figure 1.1
2. Site Plan	Figure 2.1
3. Project Plan	Figure 2.2
4. Staging Plan	Figure 2.3
5. Approved Master Plan	Figure 2.4
6. Footprint of the Approved Master Plan and Remaining Area of Land Zoned for Residential Use	Figure 2.5
7. Site Analysis	Figure 2.6
8. Aerial Photograph	Figure 3.1
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10. Built Form Control	Figure 4.1
11. Zoning Plan	Figure 5.1
12. Lower Hunter Potential Urban Areas (HREP 1989)	Figure 5.2
13. Proposed Four-wheel Drive Track	Figure 7.1
14. Vegetation Management Areas	Figure 7.2
15. Longbight Cross Sections	Figure 7.3
16. Archaeological Sites Recorded on Site	Figure 7.4
17. Proposed Additional Cultural Heritage Reserve	Figure 7.5
18. Acid Sulfate Soils on Site	Figure 7.6
Subdivision Plans	Annex B
Landscape Plans	Annex G

1.2 TECHNICAL INVESTIGATION

The preparation of the project has involved input from several technical disciplines. A series of supporting technical reports that investigated the environmental implications of the project and mitigation and management measures have been prepared. These reports were prepared as part of the Fern Bay Estate Master Plan Study and include the following:

- Fern Bay Estate Statutory Planning Report (ERM) 2005;
- Mosquito Risk Assessment Fern Bay Estate prepared by Institute of Clinical Pathology and Medical Research (ICPMR) 2004;
- Fern Bay Estate Socio-Economic Impact Assessment Report (ERM) 2005;
- Fern Bay Estate Ecological Assessment Report (ERM) 2004a;
- Fern Bay Estate Species Impact Statement (ERM) 2005;
- Fern Bay Estate Response to the Port Stephens Comprehensive Koala Plan of Management (ERM) 2005;
- Fern Bay Estate Master Plan Study Assessment of Matters of National Environmental Significance (ERM) 2005;
- Fern Bay Estate Aquatic Assessment Report (ERM) 2005;
- Fern Bay Estate Noise Assessment Report (ERM) 2005;
- Fern Bay Estate Aboriginal Heritage Assessment Report, (ERM) 2005;
- Fern Bay Estate Bushfire Assessment Report (ERM) 2005;
- Fern Bay Community Engagement and Building Sustainable Communities Greening Australia; and
- Fern Bay Estate Unexploded Ordnance Management Plan (ERM) 2004.

1.3 ANNEXURES

The Annexures contain all of the reports which are specifically relied upon in the preparation of the EAR affecting the Project Plan. Where appropriate addendum reports have been prepared and included in Annexures and/or reports have been updated to ensure that all reports relied upon have been revised to support the Project Plan application.

1.4 CONSULTATION

1.4.1 Community Consultation

Community consultation was undertaken both as part of the Master Plan approval process and during the preparation of this Environmental Assessment Report. The following consultations were undertaken:

- **Exhibition of Master Plan document:** the document was exhibited by the Department of Planning (DoP) through the assessment process. Submissions were received by the DoP and additional information was submitted by the applicant to the DoP addressing the areas of concerns.

1.4.2 Consultation with Government Agencies

During the preparation of the Master Plan extensive consultation with government departments and service agencies was undertaken in the preparation and approval process for the Master Plan. This consultation primarily involved face to face meetings. Community forums were also held with Fern Bay and Stockton.

The following people and government agencies were consulted during the preparation of the approved Master Plan:

- Department of Infrastructure Planning and Natural Resource (now know as Department of Planning);
- NSW Department of Education and Training (DET);
- Department of Environment and Conservation (DECC);
- Premier's Department and Minister for the Hunter Region;
- Roads and Traffic Authority (RTA);
- Department of Defence;
- Local Government Authorities (Port Stephens Council and Newcastle City Council);
- State Member of Parliament;
- Newcastle Airport Limited; and
- Service providers including Agility Management Pty, Energy Australia, Telstra and Hunter Water Corporation.

In addition to this consultation, a web page was set up by the previous owners Winten Property Group, providing information about the proposed development and project contact details. This has provided an avenue for

people to obtain further information about the proposal and also provide feedback.

In addition the previous owners had developed a community news letter which was widely distributed to local residents. The project has also received media coverage from a range of different mediums.

1.5 PUBLIC EXHIBITION

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

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

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

2 DESCRIPTION OF THE PROPOSAL

2.1 PROPOSED DEVELOPMENT

The total site is approximately 205 hectares in area and comprises 16.4 hectares zoned 1 (a) Rural Agriculture, 136.4 hectares zoned 2 (a) Residential, and 52.2 hectares zoned 7 (a) Environmental Protection under Port Stephens Local Environmental Plan (LEP) 2000. The land is immediately adjacent to Nelson Bay Road, midway between Stockton Beach and Fullerton Cove. A locality plan is provided as *Figure 1.1*, a site plan as *Figure 2.1* and the Project Plan is shown as *Figure 2.2*. Site survey plans are provided in *Annex B*.

The project is described as a community title subdivision which contains the following components:

- residential subdivision of 683 allotments to be created with 4 of these lots having the potential for further subdivision through residential integrated housing lots. Based on a yield of 25 lots per hectare the integrated housing lots would achieve a yield 84 lots;
- various areas of recreational and open space are proposed which will include children's playgrounds, formal parks, a Cultural Heritage Reserve, open space for both passive and active recreation, stormwater management, fire trails, pathways and ecological corridors;
- a community centre is proposed within an area of open space;
- conservation is proposed through the retention of large areas of natural vegetation within the site to be managed by the Community Association and also the management of the adjoining Worimi Regional Park to the south through an offset compensation package which has been negotiated with the Department of Environment and Climate Change (DECC);
- a site is to be created for a commercial outlet, such as a convenience store in the southeastern portion of the site; and
- a shared footpath/cycleway is to be constructed from the roundabout at the intersection of Nelson Bay Road and Fullerton Cove Road to the bus shelter at Bayway Village to the south.

The layout and staging is shown in *Figure 2.3* and the detailed subdivision plans are contained in *Annex B*.

2.2 DEVELOPMENT CONSENT BACKGROUND

Development consent (DA 7-1996-41299-1) for the 208 lot residential subdivision was initially granted by the Land and Environment Court of New

Legend

Fern Bay Seaside Village

Figure 2.1

Site Plan

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_02		
Date:	10/2/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	-		
Scale:	Refer to Scale Bar		

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Legend

- Managed Community Reserves/Parks[1]
- Community Conservation Lands[2]
- Local Activity Centre
- Mixed Use Residential Development
- Commercial Development
- Cultural Heritage Reserve
- Part of the Approved Subdivision Area
- Potential Stormwater Management Infrastructure
- Pathway
- Fire Trail
- 10 metre Asset Protection Zone
- 20 metre Asset Protection Zone
- 25 metre Asset Protection Zone

Notes:

1 Managed Community Reserves/Parks are areas of active and passive recreation for community purposes and do not form part of the community land.

2 Community lands are the 'Conservation Lands' to be managed for ecological and environmental values.

Figure 2.2

Project Plan

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_12		
Date:	10/2/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:			
Scale:	Refer to Scale Bar		

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STAGING & LOT TABLE

STAGE	RESIDENTIAL LOTS			RES.INT.HOUSING LOTS		POTENTIAL YIELD (25Lots/Ha)
	THIS PLAN	MASTER PLAN	DIFF	RIH LOTS	RIH(AREA)	
1-COMPLETED						
2-COMPLETED						
3-APPROVED(PSC)						
4	59	59	0	1	6900	17
5	58	56	2			
6	48	48	0			
7	96	96	0			
8	27	28	-1			
9	56	54	2			
10	53	57	-4			
11	45	44	1	2	14400	36
12	60	65	-5			
13	65	64	1			
14	50	54	-4			
15	62	59	3	1	12800	32
TOTAL	679	684	-5	4	34100	84

MGA

- FORMED/ CONSTRUCTED ROADS
- LOTS DEVELOPED ~ STAGE 1
- LOTS DEVELOPED ~ STAGE 2
- LOTS APPROVED – STAGES 3A & 3B (7–1996–41299–8)
- RESIDENTIAL INTEGRATED HOUSING LOTS
- COMMUNITY/PRECINCT PROPERTY
- EXISTING ACTIVE RECREATION AREA (CABBAGE TREE PARK)
- COMMERCIAL SPACE
- EXISTING FIRE TRAIL (APPROX. POSITION)
- ZONE BOUNDARY

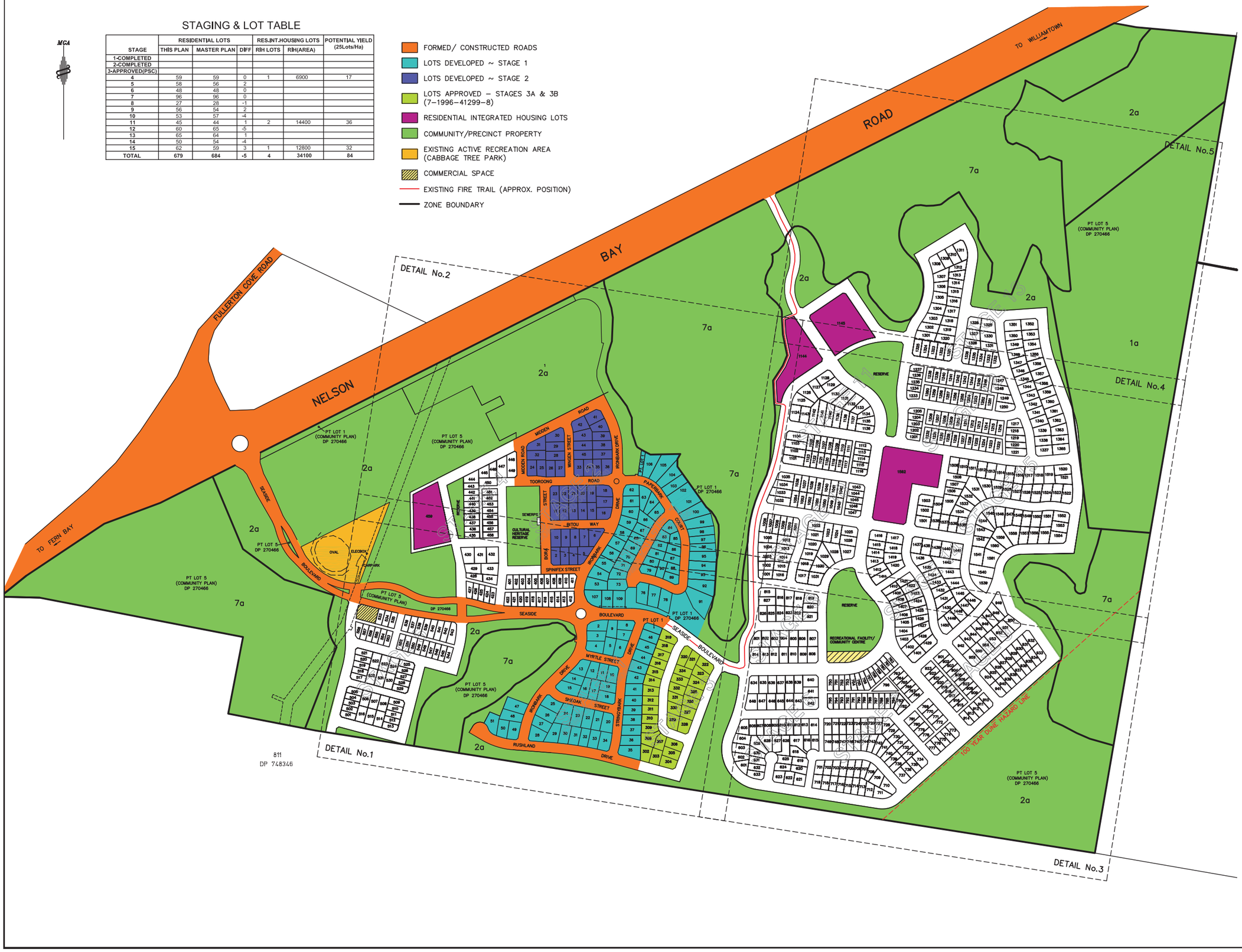

Figure 2.3

Staging Plan

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_16		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	-		
Scale:	Refer to Scale Bar		

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South Wales on 29 September 1997. Subsequent modifications to the development consent as detailed below have resulted in the creation of an Asset Protection Zone and conservation area, thereby reducing the number of residential lots to be created under DA 7-1996-41299-1 to 182 lots.

On 19 March 1999 the Land and Environmental Court of New South Wales approved a modification to the development consent pursuant to Section 96 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) which enabled minor amendments to the subdivision layout. The main reason for the modification was to provide a vegetated buffer zone between Nelson Bay Road and the residential lots within the site. This amendment was requested by Port Stephens Council. Other minor modifications to the subdivision layout were also included as part of this modification.

On 29 April 2005 a second modification to the development consent was granted pursuant to Section 96 of the EP&A Act, this time by Port Stephens Council. The main reasons for the modification of the subdivision arose from the need to:

- have regard to amendments to the *Rural Fires Act 1997*;
- restrict development to those areas of the site zoned 2(a) Residential;
- protect an area of significant Aboriginal archaeological sensitivity; and
- enable the site to be subdivided and managed under the *Community Land Development Act 1989* and the *Community Land Management Act 1989*.

Construction of the approved subdivision commenced in 2005. The access road and Stages 1 and 2 have been developed.

On 5 April 2006 a third modification to the development consent was granted pursuant to Section 96 of the EP&A Act by Port Stephens Council. The modification enabled the construction of an emergency fire trail to facilitate a second means of access to Nelsons Bay Road. This ensured compliance with Section 4.3.4 of Planning for Bushfire Protection (NSW Rural Fire Service 2001) with respect to the provision of alternative access to and egress from the development site. Planning for Bushfire Protection requires that *'at least one alternative access road needs to be provided for individual dwellings or groups of dwellings more than 200 metres from a public through road'*. These guidelines specify that the *"routes of these roads should be selected to ensure that both roads are unlikely to be cut by a fire at the same time, to ensure that there is at least one safe evacuation route available at all times"*.

On 19 December 2006 a fourth modification to the development consent was approved by Council. This modification sought to enable the establishment of an APZ on the southeast perimeter of the existing approved subdivision. The establishment of this APZ enabled the recontouring of the land in association with the adjoining approved Lot 4 which ensured future residents would not been unduly affected by earthworks.

On 12 December 2008 a fifth modification to the development consent was granted by Council, enabling the relocation of 33 of the 60 approved residential lots from the vegetated buffer zone adjacent to Nelson Bay Road (as per the first modification) to the previously identified school site, which is not required by the Department of Education.

2.3 PROJECT APPROVAL

The objective of the proposed development is to create a seaside village nestled within a natural setting that sets a new benchmark in the Hunter Region for quality and innovation in the standard of urban design, construction and environmental management.

Fern Bay Seaside Village is proposed to comprise:

- approximately 683 residential lots (an existing development consent has enabled the creation of 182 lots);
- open space lots which will include formal parks, a Cultural Heritage Reserve, asset protection zones, managed reserves and bushland open space. These areas of open space are designed to provide opportunities for passive and active recreation, stormwater management and the protection of sites both for Aboriginal heritage significance and ecological corridors;
- recreational and community facilities;
- new public roads, fire trails, cycleways and pedestrian trails; and
- bush fire asset protection zones and approved fire trails.

The site is intended to be developed to provide a range of housing types to accommodate the needs of future residents having regards to the changing demographics expected over the coming decades.

The development will be staged over a period of approximately ten years although this may be influenced by market demand. Construction for the first two stages of approved subdivision has been completed and 149 lots have been released. These stages related to 105 lots and 44 lots respectively. Stages 3a and 3b are approved and will be result in the creation of an additional 33 lots. Construction of these stages is planned to commence during 2009, subject to market demand.

2.4 MASTER PLAN APPROVAL

The EA report in support of the Project Plan has been prepared in accordance with the approved Master Plan MP 20-4-2005 which was signed by the Minister on 8 August 2006. A copy of the Master Plan approval is contained

in *Annex C* and the following section demonstrates the Project Plan's consistency with the document.

Schedule 1 of the approval contains the basic detail in relation to property description, proposed development and relative definitions. The only variation which should be noted within this schedule is the change in applicant. Winten Fern Bay No.2 Pty Limited continues to be the registered owners of the land however the Aspen Group Pty Ltd have been contracted to develop and market the land.

Schedule 2 lists the various uses within the Master Plan, the drawings from the Master Plan which are to be relied upon and the relevant background reports which provide the basis upon which the Master Plan was formulated. *Figure 2.4* shows the approved Master Plan layout. The Project Plan application will essentially be consistent with the items listed in Schedule 2 with the following omissions or modifications:

- the final number of lots will vary slightly as will the breakdown of the numbers of lots of varying sizes;

- a child care site will not be created however this use is permissible within the site and is likely to be pursued when it is viable from a market perspective;

- the community nursery will not be pursued with the area proposed to be retained as open space; and

- the Master Plan drawings also showed a swimming pool which will no longer be incorporated into the recreation facilities due to reasons of both demand and ongoing maintenance costs. It is likely that many dwellings in the Village will include pools.

Schedule 2 also contains a list of plans and drawings from the Master Plan Document and background reports. The Project Plan is generally consistent with this documentation as these reports have been utilised in formulating the project. It should be noted that a key part of the Master Plan process was to establish an ecological footprint for the subdivision and the Project Plan is consistent with the area established through the master planning process.

Schedule 3 of the Plan contains the variations to the draft Master Plan and this relates to ecological offset measures, public access to the beach, pedestrian and cycleway links to Fern Bay and the buffer to the identified owl roost tree.

The offset compensation package is discussed in *Section 2.12* and *Section 7.7*. There is also a copy of the Vegetation Management Plan contained in *Annex D*. This document demonstrates that the ecological offset measures and the issue of public access to the beach have been incorporated into a management plan through consultation with the DECC. This management plan will also be reinforced through the Statement of Commitments. This demonstrates the project plans consistency with A1 and A2 of Schedule 3.

Legend

Fern Bay Seaside Village

Figure 2.4

Approved Master Plan

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_17		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	-		
Scale:	Refer to Scale Bar		

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The subdivision plans contained within *Annex B* include the shared footway and cycleway plan from the roundabout at the intersection of Nelson Bay Road and Fullerton Cove Road to the bus shelter at Bayway Village to the south which will be constructed by the proponent as part of the proposed development (refer to Plan 16 of 18). This is consistent with the requirements of A3 of Schedule 3.

The impact of the subdivision on the identified owl roost tree was considered in establishing the footprint of the residential area. The buffer identified in A3 of Schedule 3 is shown on *Figure 2.4*. This demonstrates consistency with the requirement outlined in A3 of Schedule 3.

In summary the requirements and variations outlined in the Master Plan Approval MP 20-4-2005 have been addressed in the Project Plan application (see *Annex C*).

2.5 COMMUNITY TITLE SUBDIVISION

The subdivision will be carried out under Community Title. A Community Management Plan (CMP) will be prepared and a Community Association will be established to implement the plan. The CMP will contain design guidelines for future urban development and will also identify how the open space will be managed by the Community Association. This will ensure that a high standard of construction, amenity and environmental protection is maintained. Although the subdivision will be developed and managed under Community title, the general public will be able to use the subdivision's open space and other facilities. A Community Lands Environmental Management Plan (ERM, 2009b) has been prepared detailing the environmental management requirements for the site, including threatened species and habitat management, revegetation and weed management, pest animal management, bushfire management and stormwater management. This plan is provided in *Annex V* and will form part of the Community Management Plan.

A copy of the Community Title Statement and Stage 1 Precinct Plan are contained in *Annex E* and *Annex B,* respectively. The Community Title Statement will be constant throughout the subdivision as the overarching title document. Each stage of the subdivision will have a separate Precinct Plan and accordingly these will vary slightly relative to specific lots and uses. The Precinct Plan contained in *Annex B* is indicative of the plans that will apply to each stage of the subdivision.

The Fern Bay Seaside Village Design Guidelines are contained at *Annex F.* These guidelines apply to all of the residential lots within the Village and provide the owners with guidance in housing design. The intention of the guidelines are to provide assistance in building form, floor areas, solar access, energy efficiency, bushfire protection, external finishes, roof pitches driveways and fencing. There is a requirement that approval be obtained

from Aspen prior to submitting house plans to Port Stephens Council. This is intended to ensure a high standard of quality homes in a unified and well maintained streetscape.

The Community Title subdivision will have significant benefits to the residents of both Port Stephens and Newcastle City Council. The open space, recreational facilities and surrounding bushland will be maintained in perpetuity by the Community Association. This arrangement will enable surrounding residents from Newcastle and Fern Bay to utilise the site's facilities at no cost to the local Councils in relation to provision, maintenance and depreciation of facilities.

2.6 *BUILDING CODE OF AUSTRALIA*

The proposed subdivision will comply with the relevant standards. While the Building Code of Australia (BCA) is not directly applicable to the Project Application, the following licences, permits and approvals will be obtained and maintained for the residential subdivision:

- Port Stephens Council Construction Certificates for engineering works (including earthworks, soil and water management, roadwork drainage) for each stage of the subdivision.
- Port Stephens Council Subdivision Certificate for each stage;
- Telstra Compliance Certificates;
- Section 50 Certificates from Hunter Water.

All relevant Australian Standards will be adhered to through the process of surveying and constructing the roads and providing the respective services.

2.7 *STAGING*

The development will occur in a number of different stages. The stages have been identified in *Figure 2.3* and will be developed over the next 10 years depending on market demand. It is envisaged that stages of between 33 and 96 lots will be developed in accordance with the staging plan contained within *Table 2.1*.

Table 2.1 Staging Plan

Stage	Number of Lots
Stage 1	Completed (105 Lots)
Stage 2	Completed (44 Lots)
Stage 3	Approved (33 Lots)
Stage 4	60 lots (including 1 integrated housing lot)
Stage 5	58 lots
Stage 6	48 lots
Stage 7	96 lots
Stage 8	27 lots
Stage 9	56 lots
Stage 10	53 lots
Stage 11	47 lots (including 2 integrated housing lots)
Stage 12	60 lots
Stage 13	65 lots
Stage 14	50 lots
Stage 15	63 lots (including 1 integrated housing lot)
Total	**865 lots**
TOTAL (including integrated housing lot yield of 84 lots)	**945 lots**

2.8 *DEVELOPMENT OPTIONS*

The land was part of a wider area which included crown land to the southeast and related to an urban area of 3,500 dwellings. The crown land became part of the Worimi Regional Park and this left the subject land to be developed in isolation. Considerable time and resources have been expended studying and researching this land to determine the optimum usage and the appropriate ecological footprint.

The options based on the current zoning are for a range of residential uses. The initial intention for the subdivision in the 1990's was to create parcels of land of between 700 and 800m^2 being standard housing lots. The current plan has tried to ensure that there is a range of lot sizes to encourage a diversity of housing types and a balanced community.

2.9 *JUSTIFICATION FOR THE PROJECT*

The vision for the "Fern Bay Seaside Village" is to create an attractive residential community site within a high quality built environment that is sympathetic to the natural environment. The design of the subdivision has been carefully considered and flows from a detailed site analysis that has determined the constraints and opportunities of the site as well as relevant statutory planning consideration to determine the most appropriate development footprint. The following key constraints and features were considered:

- areas of cultural significance;
- prominent ridges covered in dry sclerophyll forest; and
- provision of a 200 metre setback from Nelson Bay Road.

The development footprint avoids all significant environmentally sensitive areas on the site. In total, only a small proportion of the site will be developed for residential use. The remaining areas will be developed into passive recreational areas or preserved as conservation areas which will be maintained by the Community Title Association and dedicated to Council.

The proposed development has been designed using the existing access off Nelson Bay Road. The proposed street network takes account of the existing topography and can readily accommodate traffic volumes expected to be generated by the proposed development. The following key circulation principles have influenced the design of the subdivision:

- provide a street network that is hierarchical, interconnected, permeable, legible, responds to the topography and creates the opportunities for view corridors;
- provide convenient and safe access for pedestrians and cyclists; and,
- ensure that the street network can accommodate an efficient public transport system and that bus stops are located to maximise patronage.

The proposed development is consistent with the Regional Strategy which has identified the area as a new release area. The area has also been identified by the Port Stephens Settlement Strategy as a future urban area. All of the residential development is proposed to be located within the 2 (a) residential land. A significant proportion of land which has been zoned for residential use will be retained as managed bushland for ecological reasons (refer to *Figure 2.5)*.

Minor sections of roads and associated infrastructure and pedestrian/fire trails are proposed within those parts of the site zoned 1 (a) Rural Agriculture and 7 (a) Environmental Protection.

2.10 SITE ANALYSIS

The design of Fern Bay Seaside Village, and in particular the location of the development, is the direct result of a comprehensive site analysis and consideration of site opportunities and constraints as well as statutory planning considerations. *Figure 2.6* indicates the topography of the land. The Master Plan approval carefully considered the topography of the land and avoided most of the ridgelines. The final layout of the project is detailed in *Figure 2.2*.

The design will provide a visual barrier from any potential impact from Nelson Bay Road. The site is fully surrounded by sand dunes and bushland

Legend

- Fern Bay Seaside Village
- 1(a) 1(a) Rural Agriculture Zone
- 2(a) 2(a) Residential Zone
- 7(a) 2(a) Environment Protection Zone

Figure 2.5

Footprint of the approved Master Plan and remaining area of land zoned for residential use.

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_11		
Date:	10/2/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	-		
Scale:	Refer to Scale Bar		

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and therefore does not have any external views. Visual impacts of the development on surrounding areas are limited to the two entry roads into the site. The future urban area will be effectively screened from view by the 200 metre wide buffer of native vegetation. The site therefore is fully self contained visually. Internal views are terminated by a visual boundary created by the natural vegetation surrounding the site. Photographs of Nelson Bay Road and the points of access have been provided in *Photographs 1* to *6*. These pictures demonstrate that the site will not be visible from Nelson Bay Road other than for the existing roundabout and current fire trail.

A Landscape Master Plan (Verge, 2007) has been prepared for the proposed development and is attached at *Annex G*. The plan provides a visual analysis of the proposed development, (refer to Figure L3 of the Landscape Master Plan). The visual analysis identifies the landscape functions of the existing vegetation in providing a visual boundary to the site. Plantings in accordance with that recommended in the Landscape Master Plan will be undertaken to provide both internal screening of roadways and filtered views of parks and community facilities, thus creating various spaces and experiences within the site.

2.11 MANAGEMENT OF COMMUNITY LANDS

The land identified on the plans as community land will become part of an integrated network of open space including an Aboriginal (Cultural) Heritage Reserve, asset protection zones, managed reserves and bushland open space. These areas of open space are designed to provide opportunities for passive and active recreation, stormwater management, and the protection of sites both for Aboriginal heritage significance and ecological corridors.

This land identified as community land will be managed and funded by the Community Title Association at no cost to Port Stephens Council. These areas will be open to the general public and will form part of a passive recreational area for the residents of Fern Bay. The Aboriginal Cultural Heritage Reserve will be managed in accordance with the Aboriginal Cultural Heritage Reserve Management Plan (ERM, 2009a).

Bushland will be managed in accordance with the Community Lands Environmental Management Plan (ERM, 2009b) provided in *Annex V* through the Community Title Association. The asset protection zones will generally be located over perimeter roads but any vegetated areas of the asset protection zone will be constructed and maintained in accordance with a bush fire management plan prepared in advance of each stage of construction.

2.12 OFFSET COMPENSATION PACKAGE

As part of the Master Plan approval an agreement was reached that the loss of habitat trees and the wet heath would be compensated through preparation

Photograph 1

View north of Nelson Bay Road from the roundabout.

Photograph 2

View north along Nelson Bay Road from the Seaside Boulevarde Roundabout.

Photograph 3

View of roundabout and entrance to Fern Bay Seaside Village taken from Fullerton Cove Road.

Photograph 4

View south from Nelson Bay opposite the Fire Trail.

Photograph 5

View of Fire Trail access point from Nelson Bay Road. Also future second access point (left in/left out intersection)..

Photograph 6

View north from Nelson Bay Road opposite Fire Trail.

ERM

Photographs

Aspen Group Pty Ltd
Fern Bay Seaside Village

and support of a Vegetation Management Plan (VMP) for the Worimi Regional Park land (previously Ministerial Part 11 land) to the south of the subdivision for a period of 20 years. This report has been prepared in consultation with DECC. A copy of the VMP prepared by ERM (2009f) is provided in *Annex D*. A Voluntary Planning Agreement will be entered into between Aspen and DECC relating to the Worimi Regional Park. The Vegetation Management Plan for the Worimi Regional Park will be implemented via the Voluntary Planning Agreement. The draft Voluntary Planning Agreement is provided in *Annex W*.

The VMP outlines measures to improve the condition of wet heath and overall management of the land by removing identified waste and weed occurrences and regenerating or restricting access to certain tracks. It also provides the detail for the formalisation of a four-wheel drive access to Stockton Beach. Through weed management, waste removal and closure of tracks, the adverse impacts on the habitat value of the areas of wet heath and dry sclerophyll forest in the Worimi Regional Park will be reduced. Extension of the preliminary principles of bush fire management and pest management identified in the VMP through implementation of the broader plans currently being developed by DECC for the Worimi Conservation Lands will further enhance habitat values through management of bush fire frequency and pest species management.

3 DESCRIPTION OF THE LOCALITY AND SITE

3.1 LOCALITY

The site is in the Port Stephens local government area, approximately 18 kilometres north of Newcastle Central Business District, six kilometres north of Stockton and 20 kilometres south of Nelson Bay.

The site is situated on a narrow strip of land which separates Stockton Bight (Tasman Sea) from the Hunter River Estuary.

Residential development within the area is primarily located within the suburbs of Fullerton Cove to the west and Fern Bay and Stockton to the south. Several industrial areas that provide employment opportunities are located at Kooragang Island and Tomago. Newcastle Airport is located approximately six kilometres north of the site.

The surrounding area is currently undergoing a growth in residential development. A number of development applications have been approved by Port Stephens Council near the site, including an Aged Care facility at 1184 Nelson Bay Road and a mobile home park at 58 Nelson Bay Road. In addition, Port Stephens Council recently approved an extension to the existing mobile home park called Bayway Caravan Village (see *Figure 3.1*).

3.2 FERN BAY

The Fern Bay Seaside Village is located on land which was zoned residential in 1995. At this time a new urban area of 3,500 dwellings was proposed and it included the adjoining crown land which formed a continuous urban area from the existing Fern Bay urban area. The crown land has since been preserved through a system of reserves and rezoned from residential to environmental protection. This change meant that the Fern Bay Seaside Village would be developed in isolation.

The following land uses either exist or have been approved on the land between the existing Fern Bay urban area and the site:

- Newcastle Golf Course is an 18 hole championship course located on the eastern side of Nelson Bay Road and immediately north of the existing Fern Bay township;

- Bayway Village relocatable home park is located on the eastern side of Nelson Bay Road and north of Newcastle Golf Course. The park contains over 400 mobile homes with the park's occupants being heavily skewed to the older demographic.

Legend

- Fern Bay Seaside Village
- SEPP 14 Wetland

Figure 3.1
Aerial Photo

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_01		
Date:	24/03/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	AA
Source:	-		
Scale:	Refer to Scale Bar		

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- a Mobile Home Park of 300 cabins has been approved on land located on the western side of Nelson Bay Road and immediately north of the existing urban area. It is likely that the demographic for this development, should it proceed, would be similar to that of Bayway Village.

- a Seniors Living Development of 250 units has been approved and commenced on land immediately north of the abovementioned mobile home park land on the western side of Nelson Bay Road.

The surrounding existing and approved land uses, with the exception of the golf course, would indicate that the future population of the locality will be likely be an older demographic. The above land uses have been shown on *Figure 3.1*.

3.3 EXISTING LANDUSE

The proposed subdivision is located within a new area of Fern Bay. Since planning approval was issued for the first stage of the subdivision (105 residential lots) by the Land and Environment Court, a number of houses have been approved and are currently under construction.

The second stage was recently completed and a number of dwellings have been approved and are currently under construction. There are 44 lots in the second stage. The third stage has approval for the creation of 33 lots, with construction planned for 2009, subject to market demand.

The first three stages consist of a number of main roads and minor roads. The road network is consistent with the approved Master Plan and approvals issued by Port Stephens Council.

3.4 LIKELY FUTURE CHARACTER

The design of the proposed subdivision has been developed following a comprehensive site analysis. Particular areas of the site are not proposed to be developed for ecological and archaeological reasons.

The subdivision layout has been designed to be sympathetic to the natural environment. Buildings within the subdivision will be of a scale, height, form and design that is distinctively coastal, complements the natural setting, and is appropriately located on the lot.

3.5 *EXISTING CHARACTER*

Fern Bay Seaside Village is a new subdivision located in a new area of Fern Bay. The Vision Statement for Fern Bay Seaside Village is:

'to create a seaside village nestled within its natural settling that sets a new benchmark in the Hunter Region for quality and innovation in urban design, construction and environmental management'.

The future character of the Fern Bay site is strongly influenced by its unique bushland and coastal location. The subdivision will have the character of a seaside village surrounded by bushland (refer to *Figure 3.2*). This bushland setting will also extend into the residential areas of the subdivision through the provision of extensive landscaping. The subdivision's design is based on the need to balance development with the preservation and enhancement of the site's natural qualities.

The major theme generators for the subdivision's character have originated from the dominant coastal environment, the traversing dune system and the site's cultural heritage and bushland setting.

3.6 *ACCESS TO COMMUNITY FACILITIES*

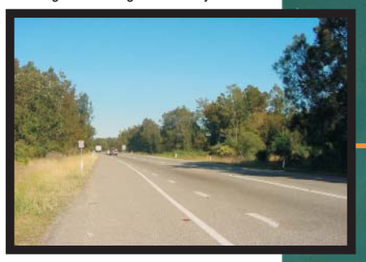
Fern Bay Seaside Village will be designed to provide residents with a high level of amenity through the provision of public facilities and services above and beyond the normal requirements of Port Stephens Council. These facilities will assist in reducing demand for existing services remote from the site.

Fern Bay Seaside Village will provide the following:

- open space lots which will include formal parks, a Cultural Heritage Reserve, asset protection zones, managed reserves and bushland open space. These areas of open space are designed to provide opportunities for passive and active recreation, stormwater management and the protection of sites both for Aboriginal heritage significance and ecological corridors;
- recreational and community facilities;
- new public roads, fire trails and pathways; and
- bush fire buffers (asset protection zones) and approved fire trails.

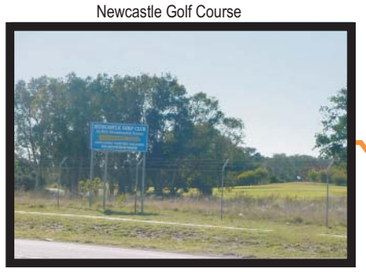
The site is intended to be developed to provide a range of housing products to accommodate the needs of future residents having regard to the changing demographics expected over the coming decades.

Looking north along Nelson Bay Road



Entrance to Bayway Village

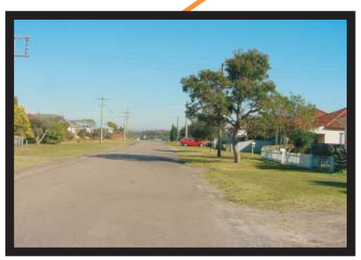
Newcastle Golf Course



Entering Fern Bay from the north of Nelson Bay Road

Motel on Nelson Bay Road adjoining Golf Course

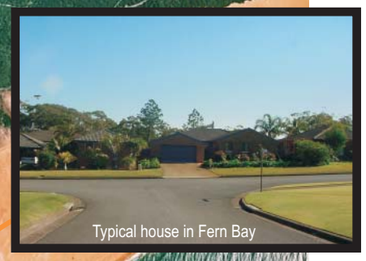
General Store on Nelson Bay Road



Rankin Road Fern Bay

Fern Bay Public School

Typical house in Fern Bay



Typical house in Fern Bay

Street layout of existing Fern Bay

Legend

Fern Bay Seaside Village

Figure 3.2

Existing Character

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_05		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	DP
Source:	-		
Scale:	Not to Scale		

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The development will be staged over a period of approximately ten years, although this will be influenced by market demand. Stages one and two of the approved subdivision has been completed and 149 lots have been released with some homes occupied in stages one and two development area. Stage three has approved for the creation of 33 lots.

4 DESIGN PRINCIPLES

4.1 INTRODUCTION

The following key urban design principles will influence the design, construction and siting of buildings within the subdivision:

- buildings will be of a scale, height, form and design that is distinctively coastal, will complement the natural setting, and will be appropriately located on the lots;
- buildings will be of quality design and provide access to natural daylight, access to natural ventilation, and visual and acoustic privacy;
- buildings will be designed and located to ensure amenity is maintained on public land;
- buildings will be located to maintain consistent street setback, street- edge configuration and view corridors;
- buildings will address the street by providing direct and on grade entries;
- urban development will be well designed and include appropriately located and sized private open space which serves to minimise urban runoff; and
- urban development will incorporate the use of water sensitive urban design.

The Community Management Plan will contain design guidelines for future urban development that are consistent with these principles. A copy of the Fern Bay Seaside Village Urban Design Guidelines is contained in *Annex F.*

4.2 COASTAL DESIGN GUIDELINES

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

Part 1 of the Guidelines defines seven coastal settlement types which can be used to analyse and understand urban development along the NSW coast. One of these settlement types is new coastal settlements. The desired future character of new coastal settlements is described in Part 1 of the Guidelines. Part 2 of the Guidelines provides design guidelines to help achieve the desired future character for coastal settlements.

A summary of the issues considered is contained in *Table 4.1.*

Table 4.1 Coastal Design Guidelines for NSW - Desired Future Character of New Coastal Settlements

Desired Future Character	Comments
New settlements:	
Respect the ecological limits of the site and its context.	The design for the proposed subdivision has been developed following a comprehensive site analysis. Particular areas of the site are not proposed to be developed for ecological and archaeological reasons.
Are developed with careful consideration for landform and views from public areas.	The subdivision layout has been designed to be sympathetic to the natural environment. Buildings within the subdivision will be of a scale, height, form and design that is distinctively coastal, complements the natural setting, and is appropriately located on the lot. Views into the site from Nelson Bay Road are blocked by a barrier of coastal forest and prominently undulating dunes and views from adjoining land are obscured by vegetation and the topography. Views of the site from Stockton Beach are not possible as they are screened by the foredunes.
Provide alternative transport option from private car use.	Streets within the subdivision will be designed for walking and cycling as well as driving. Separate pedestrian trails are also proposed throughout the subdivision. The subdivision is proposed to be serviced by a public bus service and both Blue Ribbon Bus Company and Port Stephens Coaches have expressed an interest in providing this service. The proposed bus route is along the main road running through the centre of the subdivision.
Have a public domain.	Open space areas for passive and active recreation are proposed within that part of the subdivision zoned 2(a) Residential. The 7(a) Environment Protection zoned land surrounding the proposed residential areas will also provide opportunities for public recreation.
Part of the key success of new settlements is the way the public domain relates to the geographic location and topography. The components of the public domain include:	
A pattern of development based on the unique natural, urban, historic, visual and environmental features of the location.	The proposed pattern of development has been determined following an assessment of the environmental opportunities and constraints of the site. The subdivision layout has been designed to be sympathetic to the natural environment. Particular areas of the site are not proposed to be developed for ecological and archaeological reasons.

Desired Future Character	Comments
Reserves for nature conservation and flood processes.	Those areas of the site zoned 7(a) Environment Protection adjoining the proposed residential areas of the subdivision are not proposed to be developed (except to provide pedestrian trails and vehicular access to the subdivision). Ecological corridors will also be provided through areas of the site zoned 2(a) Residential along the northern and eastern boundaries. Various stormwater management measures are proposed for the subdivision including pipe drainage, infiltration trenches, roads with one-way cross-falls, bio-retention swales, gross pollutant traps, infiltration swales and infiltration trenches. The stormwater management strategies will protect the proposed urban development from flooding whilst mitigating potential stormwater impacts of urban development on receiving environments.
Open space and public places for the recreation and social needs of residents and visitors.	Open space areas for passive and active recreation are proposed within that part of the subdivision zoned 2(a) Residential. The 7(a) Environment Protection zoned land surrounding the proposed residential areas will also provide opportunities for public recreation.
An interconnected street pattern providing long-term access and social opportunities for the settlement.	The proposal includes an interconnected street pattern.
Areas for total water cycle management.	A treatment train of stormwater management measures in keeping with the water sensitive urban design philosophy is proposed for the subdivision. This strategy has been adopted by Port Stephens Council and is being implemented for the approved subdivision (stage 1).
Relationship to the environment:	
a. New development avoids areas of ecological value and respects setbacks between natural areas.	Those areas of the site zoned 7(a) Environment Protection adjoining the proposed residential areas of the subdivision are generally not proposed to be developed (except to provide pedestrian trails, vehicular access and drainage to the subdivision). No development will occur within 100 metres of a powerful owl roost tree that has been identified in the northwestern part of the site. Setbacks will be provided between the residential areas and the surrounding 7(a) Environment Protection zoned land for bushfire protection purposes and to minimise impacts on these environment protection areas.
b. Wildlife Corridors, existing mature trees, rivers, streams, lakes and natural features are incorporated into green space networks,	A 200 metre wide vegetated corridor is proposed to be retained along the northern boundary of the site despite an existing development consent which allows part of this corridor to be subdivided for

Desired Future Character	Comments
reserve areas, riverine and foreshore corridors.	residential purposes. The developer of the subdivision is not willing to develop the approved residential lots within this corridor. A Section 96 modification application was approved by Port Stephens Council on 12 December 2008 permitting 33 of the approved lots form this area to be developed on the previously proposed school site which is not required by the Department of Education. A vegetated corridor is also proposed along the eastern boundary of the site. These corridors are designed to maintain connectivity between the vegetated areas to the north and south of the site.
c. Aboriginal and European places, relics and items are protected.	Twenty-five Aboriginal archaeological sites have been recorded within the subject land, including middens, open artefact scatters, a hearth, and a Worimi cleaver, as demonstrated in *Figure 3.2* of *Annex I* (Fern Bay Aboriginal Heritage Assessment Report, ERM 2005b). Those artefacts found along a low ridgeline in the western part of the site have been identified as being of high archaeological significance. The ridgeline is therefore proposed to become a dedicated Cultural Heritage Reserve (see *Figure 3.2* of *Annex I*). A section 90 consent under the *National Parks and Wildlife Act 1979* with salvage application has been submitted and approved by the Department of Environment and Conservation (now the Department of Environment and Climate Change) for sites within the approved subdivision footprint that are outside this ridgeline. Pursuant to section 75U of the EP&A Act further section 90 consent with salvage applications are not required for the Project Plan application under Part 3A.
d. Foreshore and estuarine vegetation is provided.	No foreshore or estuarine vegetation exists on the site.
e. The potential disturbance to acid sulfate soils is managed.	According to the Williamtown Acid Sulfate Soil Risk Map (Soil Conservation Service of NSW, 1995), the majority of the site is mapped as having a low probability of acid sulfate soils greater than three metres below the surface (see *Figure 7.5)*. Two areas along the eastern boundary of the site and one along the southern boundary have been mapped as having a low probability of containing acid sulfate soils between one and three metres below the surface. Two small areas along the northern boundary of the site and one in the western corner of the site have been mapped as having a high probability of containing acid sulfate soils within one metre of the surface. The majority of the areas mapped as having a low probability of containing acid sulfate soils between one and three metres below the surface will not be disturbed by the proposal. The areas mapped as having a high probability of containing acid sulfate soils within one metre of the surface will not be disturbed by the proposal.

	Desired Future Character	Comments
		Construction of roads, service infrastructure and houses is unlikely to involve the disturbance of material below one metre, unless cutting of the surface is required for the levelling of the ground prior to construction. Therefore acid sulfate soils are not likely to be disturbed. Geotechnical engineers will be engaged during the preparation of the detailed engineering design plans for road and drainage works, and throughout the construction phase of each stage of the project. Their brief will specifically require testing and reporting of acid sulfate soil conditions prior to the letting of tenders and the preparation of an Acid Sulfate Soil Plan of Management to be incorporated into construction contracts. This will be necessary if materials to be disturbed are below one metre depth in the areas indicated on the Acid Sulfate Risk Map. The Plan of Management will address strategies and procedures to prevent, mitigate or manage potential impacts during site works.
f.	Original native landscape is maintained and reinstated.	A Landscape Plan for the subdivision has been prepared by Verge Landscape Architects (2007). The original native landscape will be maintained within the environment protection areas of the site and in parts of the open space reserves. The landscaping of public areas will be carried out with native species.
g.	Waterways and coastal lakes are protected through water sensitive urban design and total cycle water management.	No waterways or coastal lakes form part of the site. A treatment train of stormwater management measures in keeping with the water sensitive urban design philosophy is proposed for the subdivision.
h.	Degraded natural areas are rehabilitated.	The natural areas of the site are not generally in a degraded state. Additional planting will be provided to improve the appearance of the subdivision and provide habitat for local flora.
i.	Vegetation is maintained whilst managing asset protection areas for bushfire protection.	Asset protection areas for bushfire protection purposes are proposed between the future residential areas of the site and the surrounding environment protection areas. This will include fuel reduced and fuel free areas and perimeter roads.
j.	Land swaps, community stewardship programs, transferable development rights and voluntary conservation agreements provide opportunities to sensitively locate development and protect ecosystems and views.	No land swaps, community stewardship programs, transferable development rights and voluntary conservation agreements are proposed.
k.	Native vegetation is preferred on public and private land.	Vegetation to be planted on site will comprise native species sourced locally. The Landscape Master Plan (Verge 2007) identifies species for landscaping within the public and private domain. The species selection is based on and includes species naturally occurring on site.

Desired Future Character	Comments
l. Land is vegetated with species native to the local area.	Refer to above comments.
Visual sensitivity:	
a. Views to and along the foreshore align with streets.	No foreshore views are available from this site.
b. Views and vistas of the foreshore and natural features in or surrounding the site are aligned with public streets.	Refer to above comments.
Edges to the water and natural areas:	
a. In new coastal settlements the centre and surrounding residential areas are separated from the foreshore by a parkland or roadway or nature reserve.	The most easterly part of the site is located over 500 metres from the foreshore.
b. Setbacks from the coastal edge and other surrounding natural areas, such as reserves and lakes, respect environmental constraints and protect properties from coastal hazards.	Refer to above comments. A hind dune 100 year hazard line traverses the southeastern corner of the site. No development is proposed east of this line.
c. Public access along the foreshore is generally located on the boundary between public and private land and along streets.	Four-wheel drive access to the beach will be provided from the site (see *Figure 2.2*). The Department of Environment and Climate Change (DECC) has advised that they will consider the construction of a four-wheel drive track (to the standard of a fire trail) adjacent to the southern boundary of the site in Worimi Regional Park. This track has been discussed further in the Worimi Regional Park Vegetation Management Plan (see *Annex D*). This track is proposed to be accessed from within the subdivision (refer to "beach access" area). The exact location of this track and construction details are still to be confirmed.
d. Pathways through foreshore vegetation are restricted to ensure the ecological integrity is not degraded.	Vehicular and pedestrian access to the beach from the site is currently via informal trails. A future formal four-wheel drive track is proposed to be constructed to provide a single access from the site to the beach thereby minimising further impact on adjoining native vegetation.
e. Foreshore vegetation is not removed to create views.	No foreshore vegetation is proposed to be removed.
f. Land is not filled to promote views.	Land filling is not proposed to promote views.
Streets:	
a. New coastal settlements have a street pattern similar to coastal hamlets or coastal villages. They present an ideal opportunity to provide a street pattern responding to the landform, views and	An interconnected street pattern is proposed which provides views of public open space and adjoining environment protection areas within the site and is designed for walking and cycling as well as driving and which provide a choice of routes.

Desired Future Character	Comments
permitting a high level of visual, pedestrian, cycle and vehicular permeability.	
b. The street pattern also: • creates public neighbourhood centres and a main street; • avoids privatised enclaves by providing direct access to the foreshore; • provides an interconnected and permeable street pattern; and • responds to pedestrian and cycle distances and connects to a local and regional network.	The proposed street pattern: • includes a centrally located main street which acts as the main transport route and provides access to community facilities and key areas of open space; • includes two main access roads linking the subdivision to Nelson Bay Road; • avoids private enclaves; and • is interconnected and permeable and therefore minimises excessive driving, pedestrian and cycling distances.
Buildings:	
a. The pattern of land development within the settlement is designed to provide amenity.	The subdivision has been designed to provide amenity for residents and visitors.
b. The settlement has a compact footprint to reduce land take.	The development footprint for the subdivision is confined by zoning and environmental constraints. These constraints are summarised below: • only those areas of the site zoned 2(a) Residential can be developed for residential purposes; • no development can occur to the east of the hind dune 100 year hazard line; • a 100 metre buffer area needs to be retained around the powerful owl roost tree; • a 200 metre ecological corridor needs to be maintained along the northern boundary of the site; and • the disturbance of preferred koala habitat, buffers and linking areas should be minimised.
c. Blocks and streets are walkable and safe.	Blocks and streets will be designed to be walkable and places which people will enjoy using.
d. The neighbourhood centre has commercial, retail, education and civic buildings and some shop-top housing.	Non residential buildings proposed within the subdivision include community/commercial facilities. Open space areas, pedestrian trails, barbeques, picnic shelters and childrens play equipment are proposed to be provided. The development will also make provision for commercial floorspace (refer to Plan 1 of 18 in *Annex B*). Detailed design has not occurred to date and will be subject to separate application to Port Stephens Council at a later stage once further design is completed which will be based on the needs of the Fern Bay community.
e. Buildings address the street.	All buildings will be designed to address the street by providing direct and on grade entries.
f. Tourist developments integrate into the settlement's street pattern and define the edge between public and private land.	Tourist development is not proposed.

Desired Future Character	Comments
g. Lot sizes and configurations are designed to support a range of housing types and integrate into the street pattern and the location of functions throughout the settlement.	Lot sizes and configurations have been specifically designed to support a wide range of housing types.
h. Residential areas consist of coastal villages, detached and semi-detached houses, town houses and terraces.	A variety of housing is proposed including detached housing, duplexes, villas, courtyard housing and integrated housing.
i. A diversity of lot and housing types are developed to accommodate various household sizes and types.	Refer to above comments.
j. Buildings are designed to suit the climate and use environmentally sustainable building design and materials.	Buildings within the subdivision will be of a design that is distinctively coastal, complement the natural setting, and be designed and constructed in keeping with ecologically sustainable development principles.
k. Housing types optimise visual and acoustic privacy, integrated passive solar design principles, minimise water use, and seek to achieve architectural distinction and excellence.	The built form within the subdivision will be of high quality design and provide access to natural daylight, access to natural ventilation and acoustic and visual privacy. A treatment train of stormwater management measures in keeping with the water sensitive urban design philosophy is proposed for the subdivision.
Height:	
a. Residential buildings are one and two storeys.	The majority of residential buildings are proposed to be either one or two storeys in height.
b. The neighbourhood centre or the main street has buildings up to two storeys.	Non residential buildings will be no more than two storeys in height.
c. Where visual prominence is not apparent three storey buildings may be appropriate.	Refer to comments on matter (a) above.
d. Heights are subject to place-specific urban design studies. New development is appropriate to the predominant form and scale of surrounding development (either present or future), surrounding landforms and the visual setting of the settlement. Buildings avoid overshadowing of public open spaces, the foreshore and beaches in centres before 3pm midwinter and 6.30 pm Summer Daylight Saving Time. Elsewhere avoid overshadowing of public open spaces, the foreshore and beaches before 4pm midwinter and 7pm Summer Daylight Saving Time.	No overshadowing in relation to any beaches or foreshore areas will occur as a result of the proposed development.

4.3 LANDSCAPE CHARACTER AND SURROUNDING ENVIRONMENT

4.3.1 Landscape Plan

A detailed Landscape Plan has been prepared by Verge Landscape Architects (2007) for the Master Plan application. This plan has been adopted for the proposed Project Plan application for Fern Bay Seaside Village and a copy of the Landscape Master Plan is provided in *Annex G*.

The aim of the landscaping plan is to create a unique subdivision with the character of a seaside village while maintaining the site's natural qualities.

The subdivision's identity will be created by a combination of two main landscaping strategies. The Open Space Strategy will employ a variety of unique art and furniture elements throughout the public domain of the subdivision. Each element will be designed to build on the unique seaside character of the subdivision. The Vegetation Strategy aims to preserve as much as possible of the site's existing vegetation and topography- these are the two characteristics that give the site its existing unique character.

4.3.2 Open Space Strategy

The provision of open space and landscaping within the Fern Bay Seaside Village is influenced by the following key principles:

- provide a network of open space areas that perform a number of functions including connection, movement, ecological, hydrological, archaeological and bush fire protection, passive and active recreation and children's play;
- locate open space areas in central locations within the subdivision so they can be easily accessed by residents;
- maintain ecological and view corridors through the site;
- retain as much vegetation within open space areas as possible;
- wherever possible retain the site's distinctively bushland and seaside character and existing topography;
- protect the site's existing biodiversity;
- create a sense of community ownership and participation in the natural qualities of the landscape;
- plant vegetation and use construction materials that reflect the surrounding environment and the site's three distinct vegetation communities;
- provide landscape treatments for road reserves that reflect the type of road;

- ensure that species planted within asset protection zones are appropriate and do not increase the bush fire hazard;

- use public art to reflect the site's natural qualities; and

- use interpretative signage to inform residents and visitors of the site's natural features.

The full details of the open space areas and landscaping is provided within the Landscape Master Plan (Verge 2007) provided in *Annex G* and are summarised here.

Open space areas that have already been constructed as part of Stage One and Stage Two include part of Cabbage Tree Park near the entrance to the village. The site and staging plan provided in *Annex B* (Plan 1 of 18) identifies the areas previously developed under Stage One and Two of the original development consent, including open space areas.

Apart from the roads and paths, open space within the development includes conservation reserves (environment protection areas and Cultural Heritage Reserve), three main parks, smaller pocket parks and several key focal areas. The subdivision's open space areas will be managed by the Community Association under Community Title.

The road network forms a key connecting element throughout the various character units within the development, and between the differently themed open space areas. Other connecting elements include art and furniture, and a consistent palette of materials. Open space performs a number of functions, including connection, movement, ecological, hydrological, archaeological protection, bushfire protection, passive and active recreation, children's play and commercial.

Being entirely surrounded by forest and sand dunes the site does not afford external views, and likewise will not have any visual impact on other areas, except for the views from the two entry roads. Being visually self-contained views along internal roads of the subdivision are terminated by the surrounding bushland. On-site bushland will be managed for conservation purposes by the Community Association in accordance with the Community Lands Environmental Management Plan (ERM 2009b) provided in *Annex V*. Management of the adjacent Worimi Regional Park will be in accordance with the Vegetation Management Plan (ERM 2009f) developed as part of the agreed compensatory offset package and will therefore always serve the function of borrowed landscape for the development. This borrowed landscape will be supplemented by the planting of indigenous plants within the controlled vegetation zones adjoining the road reserves and parks.

Parks

There will be three main parks located within the subdivision and these are identified within the subdivision plans contained in *Annex B* and specifically Plan 13 of 18. Each will be conceptually based on the indigenous landscape on which it is located. Plant species and construction materials will reflect each park's specific location.

Cabbage Tree Park will be located in a flat, low-lying area where most existing vegetation will be retained. This vegetation is dominated by the canopy of Cabbage Tree Palms and Broad-leaved Paperbarks. In the sheltered environment below this canopy a series of timber and concrete boardwalks and platforms will create an intricate "park" of walks and rest areas. Adults will have opportunities for quiet meditation, and children will find opportunities for adventure and play. Maintenance of sight lines by clearing mid-storey vegetation will ensure security. More details of landscaping of Cabbage Tree Park are provided on page L13 of *Annex G.*

Banksia Park is located in a higher density area, close to the community facilities, and will therefore be heavily used. This will be reflected in the harder, urban materials of concrete and masonry that will be used to create a contemporary urban park. Planting will consist of species from the site's indigenous Apple Blackbutt Forest.

Corymbia Park will be a playground of sand dunes constructed from "soft-fall" which will recall the sand dunes underlying the site's heath vegetation. Multi-coloured steel poles will form forests, throwing walls and other play equipment. Shade trees will consist of the heath's emergent vegetation *Eucalyptus* spp.

Conservation Reserves

Reserves of natural bushland will be retained and protected within the Fern Bay Seaside Village in the form of environmental conservation reserves and a Cultural Heritage Reserve (see *Figure 2.2* and *Annex B*). The vegetation and soils within Cultural Heritage Reserve will not be removed or disturbed in any way. Erosion mitigation measures will be implemented on the margins of the reserve to ensure soils containing Aboriginal objects are not removed through erosion.

Conservation reserves generally fall within that part of the site zoned environment protection and within the wildlife corridor. The vegetation within these reserves will be protected and enhanced to maintain and improve ecological values and visual corridors. Pathways will be constructed through these reserves to provide opportunities for people to experience the natural bushland and provide connectivity between different residential areas.

Active Recreation Area

Active recreation areas will be provided beside the main entry road within the Cabbage Tree Park. This area provides passive and active recreation opportunities. The location of Cabbage Tree Park is identified in Figure L2 of the Landscape Master Plan located in *Annex G* and in *Annex B* Plan 13 of 18. A generous open turf area will be surrounded by woodland of native trees with picnic shelters and barbeques.

Streetscape

The subdivision is visible from the outside at the two entry roads. These areas will be landscaped using native flora to highlight and dress the entries while retaining the landscape character of the nearby bushland. Treatment of these areas is described in L6, L7, L8, L9 and L12 of *Annex G*. Within the subdivision, manipulation of internal views with screen planting will be one of the major devices used to create various spaces and experiences. Visual access will be maintained to key areas, such as parks and playgrounds, to allow passive surveillance for increased security.

Roads and paths within the development are organised according to a hierarchy ranging from the substantial, highly trafficked main road, down to laneways, cycleways paths and walking tracks through bush. Landscape treatment for each type of road and pathways reflects their level in the hierarchy, while also serving the overall design intent for the settlement. The roads and paths form a significant part of the overall open space network. The road hierarchy reflects character units and housing types. Pathways through bushland areas will be sited to reduce environmental impacts such as edge effects and erosion.

The road thematic zones are described on pages L6 to L12 of *Annex G*. Landscape treatment of a typical collector road, typical neighbourhood street and typical perimeter road is shown in L14 to L16 of *Annex G*.

4.3.3 Vegetation Strategy

The site's existing vegetation is a floristically and aesthetically rich combination of three distinct ecological communities:

- Swamp Forest (consisting of two sub-communities);
- Apple Blackbutt Forest; and
- Heath.

This richness has evolved from the site's unique combination of geology, hydrology and climate. The planting strategy aims to maintain, where possible within both the public and private domain of the site, the same aesthetic and ecological values that occur in the existing vegetation

communities. This involves maintaining the variety and feel of existing vegetation communities in terms of texture, light, wind, sound, opening and enclosure and species associations. In general, there will be a clear delineation between "natural" and "contrived" planting, through the use of raised planters, monospecific stands, geometric layouts etc. Biodiversity will be preserved by primarily using only plant material sourced from the local area. Where possible, Koala habitat trees will be used in public areas in accordance with Port Stephens Council Comprehensive Koala Plan of Management.

This strategy supports the aims of SEPP 71 and the Coastal Policy in terms of ecological sustainable development (ESD) and maintaining existing character by using indigenous flora.

Planting Themes

With the exception of street trees that respond to the specific requirements of Port Stephens Council, planting throughout the public domain will be based on palettes of species derived from the site's indigenous floristic communities. The location of different planting themes will be based on the existing distribution of plant communities. This will ensure a strong visual and species connection between planted areas and adjoining natural areas.

While there is considerable overlap between the existing vegetation communities in terms of species distribution, each community is easily distinguished by its unique physical characteristics and representative species. Apart from choosing species present in each community, planting will be structured in similar ways to the natural communities. Palettes based on the two forest communities will utilise canopy, mid and understorey plants to create spaces and to control views. Similarly the palettes based on the heath community will include emergents, shrubs and groundcover plants. These communities are described in further detail on page 5 of *Annex G*.

Species suitable for more urban areas may also include species from a presumed belt of littoral rainforest that existed previously on the site. Use of these species will increase the variety of tree form and habitat available for use in urban areas.

Vegetation zones and derived planting themes and planting palettes are described in detail in the Landscape Master Plan on pages 5 through to 8 and shown in Figures L4 and L5 of *Annex G*.

Plant Rescues Zones

Wherever possible, substantial plants suitable for transplanting will be relocated on site. This has both ecological and aesthetic benefits. Using suitable equipment most species can be successfully transplanted. Selection of individual trees for transplanting will depend on species, maturity, health,

accessibility, safe useful life expectancy (SULE) and availability of a suitable location for transplanting to.

High priority areas for plant rescue are shown on the planting strategy plan. These areas have been identified based on the likelihood of finding significant numbers of transplantable trees that will be used in the early stages of the subdivision.

Vegetation Zones

Planting throughout the development is in four zones, with different principles guiding the selection, sourcing and maintenance of plant material in each zone. These zones are described on page 5 and shown on L4 of *Annex G*. The planting themes and palettes are described in detail in the Landscape Master Plan on pages 6 through to 7 and shown in L5 and L17 (Verge 2007).

Zone 1 includes parks, reserves and feature planting in roundabouts and at the entry. Where possible, remnant vegetation will be preserved, but where this is not possible planting themes will be established to suit the intended program based on species native to the site.

Zone 2 vegetation zone covers the streetscape and bio-retention swales. The road reserves are a significant proportion of the public domain, and the most prominent part of the subdivision. The medium to low planting within road reserves, in addition to meeting the general aims of the planting strategy, also serves a stormwater treatment purpose. Planting of roads and swales varies to reflect the different character units of the subdivision. Street trees within this zone will take into consideration the requirements of Port Stephens Council, however significant numbers of mature trees will be transplanted into this zone to ensure immediate visual and micro-climatic (esp. shade) amenity.

Zone 3 or the Controlled Vegetation Zone (CVZ) continues the understorey planting theme of the adjacent road reserve in a three metre wide strip within private lots with the upper canopy species reverting to that set out in the endemic planting pallets on pages 6 and 7 of the Landscape Plan (Verge 2007). The location of the CVZ relative to zone 2 and 4 is shown on L17 of *Annex G*.

By widening the area of streetscape planting and the inclusion of endemic tree species, the bushland theme can be carried through the subdivision more strongly. The CVZ will be maintained by the land holder with the assistance of the developer/Community Association. In some areas the developer will undertake the initial planting and establishment or provide planting stock to the landowner for inclusion within this zone. Layout and design of this area is undertaken in consultation with the landowner in order to ensure solar access etc. to individual homes.

Zone 4 is the private domain on all private land but excluding the CVZ. Residents may only landscape and plant within the private domain as

approved by the Design Review Panel. These constraints are aimed at preserving the site's ecological values and bushland character. Prior to sale, land in the private domain that has not already been cleared, is to be cleared of all extremely large trees and trees that are considered dangerous or with a SULE of <15 years. All other trees are to retained and removed only as part of the Design Review process on a lot-by-lot basis. This will retain extensive tree canopy on the site that will be protected by councils Tree Preservation Order. Constraints on selection of species and materials in the private domain are aimed primarily at eliminating environmental weeds and preserving the site's bushland character. Constraints include limiting turf in rear yards and controlling the use of plant species that are known to be or may become environmental weeds. Education programs will encourage residents to correctly manage pets to reduce impacts on native fauna.

4.3.4 Public Art and Interpretative Elements

Public Art and Interpretation Strategy

In combination with the vegetation or planting strategy, the use of art, signage and furniture will determine the overall feel and identity of the subdivision. The Art and Interpretation Strategies are closely linked, and will perform a major role in achieving design outcomes in terms of amenity, bushland and coastal identity and environmental education. These strategies are depicted on page 8 of *Annex G*.

Public Art will make a major contribution to the feel of the site and will also serve an environmental education role. Some artworks will also be play elements. The Art Strategy encompasses both individual sculptural and installation pieces, and also furniture elements that are used throughout the site.

Major art elements will include:

- installation of palms at Nelson Bay Rd roundabout;
- sculptural installation on the main road based on the site's physical qualities;
- solar powered light poles incorporating Fern Bay logo;
- opportunities for community art in the three main parks; and
- incorporation of Fern Bay logo/motif into other public furniture including bollards, seats, interpretive and directional signage.

Interpretation of the site's natural and archaeological qualities will contribute to residents' sense of ownership of the subdivision, and will also increase the sense of being close to the bush and to a sensitive natural environment.

Interpretation will consist of signage and artwork, with subjects for interpretation including wildlife, flora, water sensitive urban design, geology and hydrology, asset protection zone and aboriginal archaeologically. Interpretative signage will be designed and incorporated into the public art strategy for the subdivision, looking at new and ingenious ways to address and impart information within the sites natural environment. The opportunities exist for art works to incorporate signage to further develop a unique character for the subdivision.

Materials

The existing landscape of Fern Bay is characterised by the variety and diversity of textures, colours and sounds. Materials to be used in artworks and furniture will be chosen from a palette designed to highlight and complement the site's natural physical qualities. Materials for furniture will include steel and hardwood plantation timber. Pavements will incorporate concrete stencilling and unit pavers with coastal motifs. Public art elements will be commissioned to incorporate environmental and educational themes. Materials for artworks will include stainless steel, glass and perspex. Lighting effects in artworks may be created by incorporation of sustainable technology such as solar panels, fibre optics and LED lighting. The Landscape Plan provided in *Annex G* provides details of indicative materials to be used throughout the landscaped areas of Fern Bay Seaside Village.

4.3.5 Roads, Paths and Trails

Roads will form the first, and for many, the main impression of Fern Bay, therefore it is important that they reflect the design aims of the subdivision. The landscape treatment of the roads, bio-retention swales and verges aims to retain as far as possible the physical and sensory qualities of the site's existing vegetation (see L14 to L17 of the Landscape Master Plan). Planting will mimic the structure of existing plant communities with mid- and understorey species. Planting will be as dense as possible with regard to bushfire, vehicle safety and resident amenity. The impact of streetscape planting has been increased by extending the planting into private lots in the Controlled Vegetation Zone (Refer L14 of *Annex G*). This zone is explained further in the Vegetation Strategy.

Paths and pedestrian trails will be of three main types:

- concrete footpaths;
- pedestrian trails; and
- boardwalks.

Shared pedestrian/vehicle access, footpaths, and pedestrian trails will be sited to minimise environmental disturbance and to maximise pedestrian amenity.

Design of pedestrian trails will reflect DECC construction techniques, but will be to a higher standard of both construction and materials. This will add to the perception of the site's environmental sensitivity and natural values.

Concrete footpaths 1.2m to 1.5m wide will be provided adjacent to roads. Concrete may be coloured or sandblasted to suit overall design intent. Where footpaths cross drainage swales fully accessible steel and timber bridges will be installed.

Pedestrian trails will generally be 2m wide and consist of natural surfaces. Trails will be constructed for pedestrian access through less sensitive areas. Boardwalks will be installed along sections of the pedestrian trails to provide and to control pedestrian access to environmentally sensitive areas. Boardwalks will be of two types: rigid and flexible. Flexible boardwalks will be used over sand dunes, while the rigid boardwalks will be used in wetlands and to provide elevation over sand dunes. Rigid boardwalks will wherever possible provide full disabled access. *Figure 2.2* identifies the location of pedestrian trails throughout the Fern Bay Seaside Village.

The design of Fern Bay Seaside Village, and in particular the location of development, is the result of a comprehensive site analysis and consideration of site opportunities and constraints as well as statutory planning considerations.

4.4 SITE TOPOGRAPHY

The subdivision layout has been designed to be sympathetic to the natural environment. In designing the subdivision, topography, aspect and lot sizes have been taken into consideration to ensure that solar access is maximised to each residential lot. Larger lots and open space areas within the development footprint are generally proposed on steeper parts of the site and ridgeline in order to retain existing vegetation.

Given the retention of significant areas of vegetation around the proposed development footprint, the subdivision will have minimal impact on the landscape and/or the scenic quality of the locality.

4.5 STREET HIERARCHY, WALKING AND CYCLING OPPORTUNITIES

The proposed road hierarchy for the subdivision includes:

- a collector road through the centre of the subdivision with a variable road reserve width, the minimum width being 17 metres;
- perimeter roads with 20 metres road reserve widths;

- neighbourhood street with road reserve width varying from 15 to 20 metres; and
- fire trails with trafficable widths of four metres.

The collector road will act as the main transport route through the subdivision and will provide access to community facilities and key areas of open space.

During the consultation process a number of issues were raised and addressed to the satisfaction of the Department of Planning. Amongst these concerns were the most appropriate location for a local activity centre, effective pedestrian and cycle links to Fern Bay, and the capacity adequacy of infrastructure in the locality. The local activity centre has been strategically located in the middle of the subdivision to provide a focal point for future residents. It will be serviced by a comprehensive network of pedestrian trails linking residential areas to open space and community and commercial facilities, thereby enhancing "walkability".

4.6 LANDSCAPE PRINCIPLES

The Landscape Master Plan aims to create a unique subdivision with the character of a seaside village while maintaining the site's natural qualities.

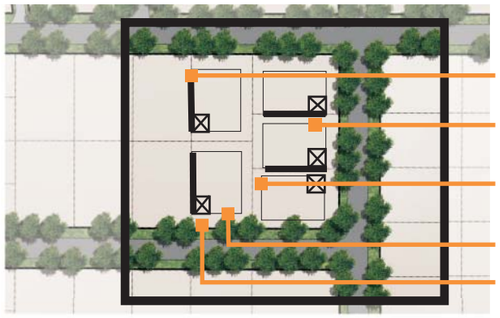
The subdivision's identity will be created by a combination of two main strategies. The 'Open Space Strategy' will employ a variety of unique Art and Furniture elements throughout the public domain of the subdivision. The second strategy is the 'The Vegetation Strategy' which aims to preserve as much as possible of the site's existing vegetation and topography. These are the two things that give the site its existing unique and natural character

4.7 BUILT FORM CONTROLS

The built form within the subdivision will be of high quality design and provide access to natural daylight, natural ventilation and acoustic and visual privacy. The majority of the residential buildings will be no more than one or two storey and have a maximum height of nine metres (see *Figure 4.1).*

Conventional 590m² +

Residential Conventional Lots 590m^2+



Courtyard - 450 to 589m²

Villas - 340 to 399m² and Premium Villas - 400 to 449m²

Residential Premium Villas 400m - 449m^2

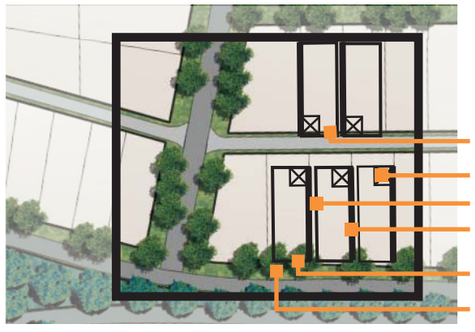


Figure 4.1
Built Form Control

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_06		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	-		
Scale:	Not to Scale		

N

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ERM

5 PLANNING SUMMARY

5.1 COMMONWEALTH LEGISLATION

5.1.1 Environment Protection and Biodiversity Conservation Act, 1999

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

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

An assessment has been undertaken of the Fern Bay Seaside Village which concluded that the proposal would not have any impact on matters of national environmental significance (see *Annex H*). The site is not in a world heritage area; is not a national heritage place; contains no Ramsar wetlands of international importance nor a Commonwealth marine environment; and the proposal is not a nuclear action nor does it have a significant impact on migratory species listed in the EPBC Act or threatened species or ecological communities listed in the EPBC Act. Therefore, referral to the Commonwealth Minister for the Environment, Heritage and the Arts is not required.

5.2 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act) enable the preparation of local environmental plans, development control plans, regional environmental plans and State environmental planning policies to control development at the local, regional and State level. Those planning instruments and policies that are applicable to the proposed development along with other relevant statutory considerations are addressed in this chapter.

The application is submitted under Part 3A Major Projects of the EP&A.

5.3 *STATE ENVIRONMENTAL PLANNING POLICY (MAJOR PROJECTS)*

State Environmental Planning Policy (SEPP) (Major Projects) defines certain developments that are major projects under Part 3A of the EP&A Act and determined by the Minister for Planning.

Schedule 2 identifies specific sites where particular development is classified as a 'Major Project', to which Part 3A of the EP&A Act applies. Clause 1 refers to development in coastal areas. Clause 1 states:

'(1) Development within the coastal zone for any of the following purposes:

(j) subdivision for residential purposes of land that is not in the metropolitan coastal zone (unless it is wholly or partly in a sensitive coastal location):

(i) into more than 25 lots, or

(ii) into 25 or fewer lots, if the land proposed to be subdivided and adjoining or neighbouring land in the same ownership as that land could be subdivided into more than 25 lots'

SEPP Major Projects defines the metropolitan coastal zone as:

'that part of the coastal zone between the northern boundary of the local government area of Newcastle City and the southern boundary of Shellharbour City.'

As the proposed development includes the subdivision of over 25 allotments and the site is not located within the metropolitan coastal zone, Part 3A of the EP&A Act applies. This application has been prepared in response to this approval process.

The Minister has also confirmed that the development of the Fern Bay Seaside Village is considered to be a major project under Part 3A of the EP&A Act as specified in the Major Projects SEPP.

5.4 *STATE ENVIRONMENTAL PLANNING POLICY (INFRASTRUCTURE) 2007*

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

- site with access to any road: *200 or more allotments where the subdivision includes the opening of a public road*; or

- site with access to a classified road or to a road that connects to a classified road (if access within 90m of connection, measured along alignment of connecting road): *50 or more allotments.*

The Fern Bay Seaside Village development will result in the creation of 683 allotments with four of the lots having the potential for further subdivision with a potential yield of 84 allotments. The provisions of the Infrastructure SEPP therefore apply to the development and in accordance with Clause 104 of the Infrastructure SEPP the application is required to be referred to the Roads and Traffic Authority. A Traffic Impact Assessment has been undertaken for the development and is located within *Annex M.*

5.5 STATE ENVIRONMENTAL PLANNING POLICY NO 71 - COASTAL PROTECTION

State Environmental Planning Policy No. 71 – Coastal Protection (SEPP 71) applies to land (the whole, or any part of which) that is within the "coastal zone" of New South Wales. The site is within the coastal zone as defined on the SEPP 71 – Coastal Protection Map (PSC, 2002), and therefore SEPP 71 applies to the land.

The proposed subdivision is a specified significant coastal development under Schedule 2 of SEPP 71 as it involves the subdivision of land within a residential zone into more than 25 lots. Approval was issued for the Master Plan on the 8 August 2006. However, the proposal is now considered under the provisions of the State Environment Planning Policy (Major Projects) and the Minister is the consent authority. The provisions of Part 2 (Matters for Consideration) and Part 4 (Development Control) of SEPP 71 apply to the proposed subdivision and are addressed in *Table 5.1.*

Table 5.1 SEPP 71 Considerations

Part/Clause	Consideration	Comments
Part 2, Clause 8	(a) The aims of this Policy set out in Clause 2.	
	(a) To protect and manage the natural, cultural, recreational and economic attributes of the New South Wales coast.	The proposal will enhance the cultural and economic attributes of Fern Bay through the appropriate provision of residential housing. A significant proportion of the site's native vegetation is proposed to be retained. Significant archaeological sites along the low ridgeline in the centre of the site will also be preserved.
	(b) To protect and improve existing public access to and along coastal foreshores to the extent that this is compatible with the natural attributes of the coastal foreshore.	Four-wheel drive access to the beach is proposed to be provided from the site. The Department of Environment and Climate Change (DECC) has advised that they will consider the construction of a four-wheel drive track (to the standard of a fire trail) to the south of the site on DECC managed land. This track will be accessed from within the subdivision. The exact location of this track and construction details are to be confirmed with DECC.
	(c) To ensure that new opportunities for public access to and along coastal foreshores are identified and realised to the extent that this is compatible with the natural attributes of the coastal foreshore.	Refer to above comments.
	(d) To protect and preserve Aboriginal cultural heritage, and Aboriginal places, values, customs, beliefs and traditional knowledge.	Twenty-five Aboriginal archaeological sites have been recorded within the subject land, including middens, open artefact scatters, a hearth, and a Worimi Cleaver. Those artefacts found along a low ridgeline in the western part of the site have been identified as being of high archaeological significance. The ridgeline is therefore proposed to become a dedicated Cultural Heritage Reserve. A Section 90 consent with salvage application has been submitted and approved by DEC for sites within the approved subdivision footprint that are outside this ridgeline. Another Section 90 consent with salvage application will be lodged for the other archaeological sites within the remainder of the subject land that is proposed to be developed.
	(e) To ensure that the visual amenity of the coast is protected.	Views of the site from Stockton Beach and the Tasman Sea are not possible as they are screened by the foredunes.

Part/Clause	Consideration	Comments
	(f) To protect and preserve beach environments and beach amenity.	Access to the beach is proposed to be via a future four-wheel drive track wihtin the adjacent Worimi Regional Park. Four-wheel drive vehicles are currently used on Stockton Beach for recreational purposes. Access to the beach will be limited to this track in order to minimise impacts on the dune system and coastal vegetation.
	(g) To protect and preserve native coastal vegetation.	A significant proportion of existing vegetation on site will be retained. Vegetated ecological corridors will be retained along the northern and eastern boundaries of the site and an open space link will be provided through the centre of the site. These corridors will maintain connectivity between the vegetated areas to the north and the south of the site. As stated above, access to the beach is proposed to be limited to the 4WD track in order to minimise impacts on the dune system and coastal vegetation.
	(h) To protect and preserve the marine environment of New South Wales.	The most easterly part of the site is located over 600 metres from the sea. Various stormwater management measures are proposed including pipe drainage, infiltration trenches, roads with one-way cross-falls, bio-retention swales, gross pollutant traps, infiltration swales and infiltration trenches to minimise impacts on receiving environments.
	(i) To protect and preserve rock platforms.	No rock platforms are located in the vicinity of the proposed development.

Part/Clause	Consideration	Comments
	(j) To manage the coastal zone in accordance with the principles of ecologically sustainable development (within the meaning of Section 6(2) of the *Protection of the Environment Administration Act 1991*).	The proposal promotes the use of ecologically sustainable development principles by: • incorporating energy efficient subdivision design; • the adoption of a water sensitive urban design philosophy; • the retention of a significant amount of the site's bushland both in environment protection areas, ecological corridors and areas of open space; • using engineering, architectural and other best practices to reduce development impacts; • protecting Aboriginal archaeological sites of high archaeological significance; • utilising existing service infrastructure; • minimising the degradation of the dune system and coastal vegetation through the provision of a 4WD track to limit beach access; • creating opportunities for public transport usage thereby improving the efficiency of local and regional services; and • providing additional residential land to meet increasing demand.
	(k) To ensure that the type, bulk, scale and size of development is appropriate for the location and protects and improves the natural scenic quality of the surrounding area.	The subdivision layout has been designed to be sympathetic to the natural environment. Housing within the subdivision will be of a scale, height, form and design that is distinctively coastal, complements the natural setting, and is appropriately located on the lot.
	(l) To encourage a strategic approach to coastal management.	A large number of specialist studies were undertaken in 1992 to secure the rezoning of more than 66 percent of the site to accommodate residential development. These studies formed the basis of a Local Environmental Study which was commissioned by Port Stephens Council. The site is identified in the Hunter Regional Environmental Plan 1989 as an "investigation area" and in the Port Stephens Urban Settlement Strategy (PSC 2003) as a "future neighbourhood" centre.

Part/Clause	Consideration	Comments
	(b) Existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and, where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved.	Vehicular and pedestrian access to the beach from the site is currently via informal trails. There is currently no disabled access to the beach in this area. A formal four-wheel drive track is proposed to be constructed to provide access from the site to the beach. This track will be constructed to the standard of a fire trail. To access the beach, disabled persons would be required to travel within an appropriate four-wheel drive vehicle along this proposed track.
	(c) Opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability.	Refer to above comments.
	(d) The suitability of development given its type, location and design and its relationship with the surrounding area.	Refer to comments on matter (k) above. The proposed residential areas of the site will be surrounded by existing vegetation that will be retained and protected. Appropriate asset protection zones will be provided between the residential areas and the adjoining bushland. Single fronted perimeter roads will generally be used to define the edge of the residential areas. This means that the front of residential properties will generally face adjoining bushland and areas of open space.
	(e) Any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore.	The site is not located on the coastal foreshore and will therefore not overshadow or affect the amenity of the coastal foreshore. Views of the site from Stockton Beach are not possible as they are screened by the foredunes.
	(f) The scenic qualities of the New South Wales coast, and means to protect and improve these qualities.	Refer to above comments.

Part/Clause	Consideration	Comments
	(g) Measures to conserve animals (within the meaning of the *Threatened Species Conservation Act 1995*) and plants (within the meaning of that Act), and their habitats.	Various measures are proposed to minimise the impact of the proposal on flora and fauna. These measures include: • retaining a minimum 200 metre wide vegetated corridor along the northern boundary of the site as well as a corridor along the eastern boundary in order to maintain connectivity between the vegetated areas to the north and south of the site; • maintaining a buffer area of 100 metres around a powerful owl roost tree that has been identified in the northwestern part of the site; and • preventing the disturbance of certain areas of preferred koala habitat.
	(h) Measures to conserve fish (within the meaning of Part 7A of the *Fisheries Management Act 1994*) and marine vegetation (within the meaning of that Part), and their habitats.	No threatened fish or aquatic invertebrates are likely to be affected by the proposed development. Various stormwater management measures are proposed including pipe drainage, infiltration trenches, roads with one-way cross-falls, bio-retention swales, gross pollutant traps, infiltration swales and infiltration trenches to minimise impacts on receiving environments.
	(i) Existing wildlife corridors and the impact of development on these corridors.	Refer to comments on matter (g) above.
	(j) The likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards.	A hind dune 100 year hazard line traverses the southeastern corner of the site. No development is proposed east of the hind dune 100 year hazard line.
	(k) Measures to reduce the potential for conflict between land-based and water-based coastal activities.	The proposed development will not result in any conflict between land-based and water-based coastal activities as it is not located on the foreshore.
	(l) Measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals.	Refer to comments on matter (d) under the aims of SEPP 71.
	(m) Likely impacts of development on the water quality of coastal waterbodies.	Refer to comments on matter (h) above.

Part/Clause	Consideration	Comments
	(n) The conservation and preservation of items of heritage, archaeological or historic significance.	Refer to comments on matter (l).
	(o) Only in cases in which a council prepares a draft local environmental plan that applies to land to which this Policy applies, the means to encourage compact towns and cities.	Not relevant to this project.
	(p) Only in cases in which a development application in relation to proposed development is determined:	
	(i) The cumulative impacts of the proposed development on the environment.	The main cumulative impacts of the proposal are the loss of native vegetation and destruction of Aboriginal archaeological sites. These issues are addressed in the Fern Bay Estate Species Impact Statement and the Fern Bay Estate Aboriginal Heritage Assessment Report.
	(ii) Measures to ensure that water and energy usage by the proposed development is efficient.	The subdivision will incorporate water sensitive urban design. The proposed subdivision generally comprises interconnected streets, which facilitate pedestrian mobility. This is more efficient as it reduces vehicle fuel consumption. Housing within the subdivision will be designed to maximise water and energy efficiency. The installation of rainwater tanks became mandatory for new residences in July 2005 when the Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004 because effective within the Port Stephens LGA. Demand for reticulated water supply will be further reduced across the subdivision with the requirement of AAA rated showerheads and tap fittings, dual flush toilets and AAAA rated washing machines.
Part 4, Clause 13	A provision of an environmental planning instrument that allows development within a zone to be consented to as if it were in a neighbouring zone, or a similar provision, has no effect.	The proposal does not rely upon flexible zoning provisions.

Part/Clause	Consideration	Comments
Part 4, Clause 14	A consent authority must not consent to an application to carry out development on land to which this Policy applies if, in the opinion of the consent authority, the development will, or is likely to, result in the impeding or diminishing, to any extent, of the physical, land-based right of access of the public to or along the coastal foreshore.	The proposed development will not restrict or inhibit public access to the coastal foreshore. It will actually improve access to the foreshore through the provision of a four-wheel drive track from the site to the beach.
Part 4, Clause 15	The consent authority must not consent to a development application to carry out development on land to which this Policy applies in which effluent is proposed to be disposed of by means of a non-reticulated system if the consent authority is satisfied the proposal will, or is likely to, have a negative effect on the water quality of the sea or any nearby beach, or an estuary, a coastal lake, a coastal creek or other similar body of water, or a rock platform.	Effluent from the subdivision will be disposed of via a reticulated sewer system. The sewer servicing strategy for the subdivision has been approved by Hunter Water Corporation.
Part 4, Clause 16	The consent authority must not grant consent to a development application to carry out development on land to which this Policy applies if the consent authority is of the opinion that the development will, or is likely to, discharge untreated stormwater into the sea, a beach, or an estuary, a coastal lake, a coastal creek or other similar body of water, or onto a rock platform.	Refer to comments on matter (h) above.

In accordance with Part 5 (Master Plans), Clause 18 of SEPP 71, the Minister for Planning cannot grant consent to the proposed subdivision until a draft Master Plan has been prepared for the land and the draft Master Plan has been adopted by the Minister. A draft Master Plan has been prepared and was approved by the Minister on the 8 August 2006 for the site.

5.6 PORT STEPHENS LOCAL ENVIRONMENTAL PLAN 2000

Port Stephens Local Environmental Plan 2000 (LEP 2000) is the principal local environmental planning instrument governing land use in the Port Stephens local government area. LEP 2000 zones the site 1(a) Rural Agriculture, 2(a) Residential, and 7(a) Environmental Protection. These zones are illustrated in *Figure 5.1*.

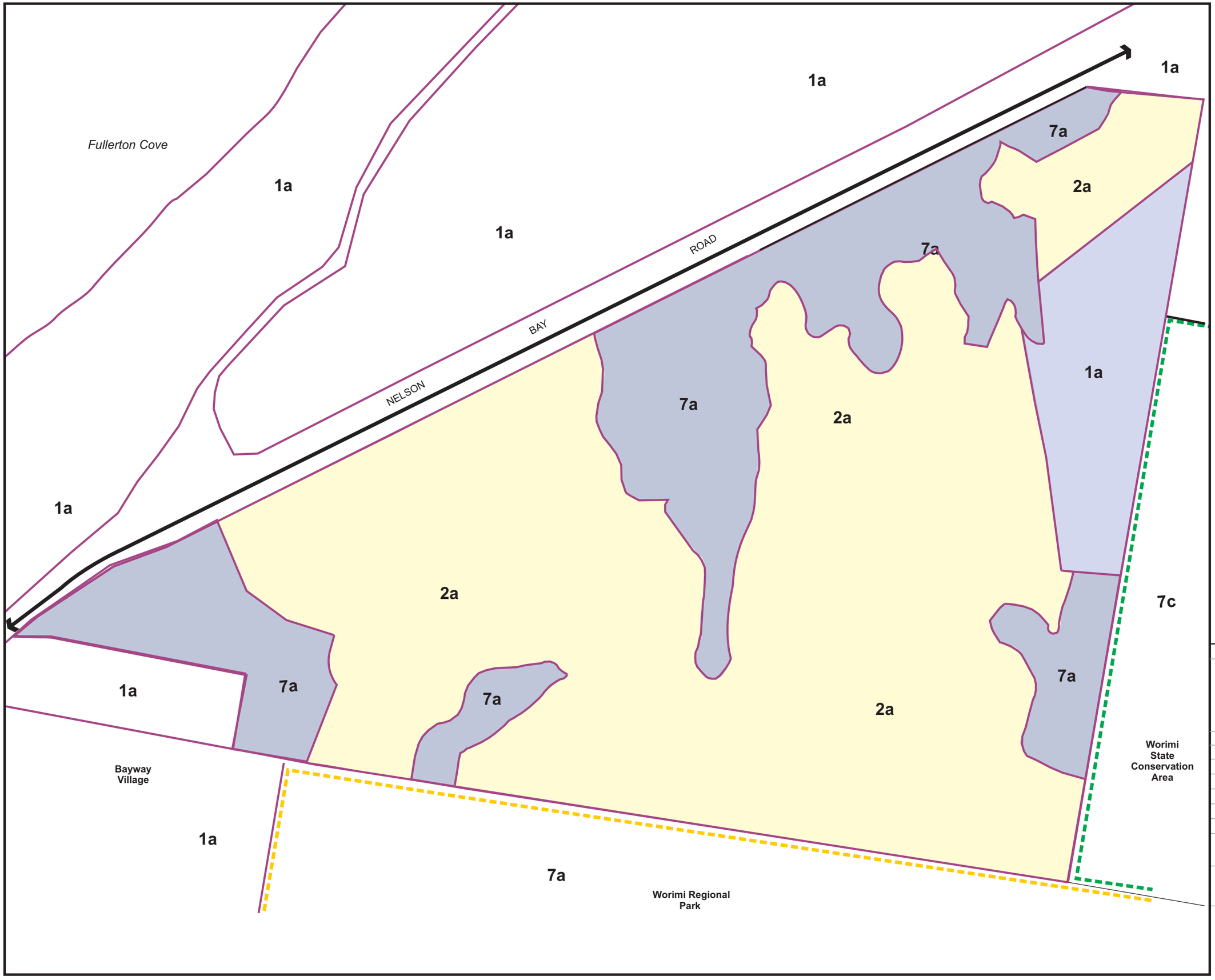
5.6.1 Permissibility

The proposed development is located within the 2(a) Residential zone (refer to *Figure 2.5*). A road and associated infrastructure and pedestrian trails are proposed within part of the site zoned 1(a) Rural Agriculture. A small section of roadway and pedestrian trails are proposed within the 7(a) Environment Protection areas of the site. These uses are permissible with consent in both the 1(a) and 7(a) zones and this is further described below.

Clause 19 of the LEP 2000 specifies a number of development standards for residential development. These standards include the minimum density standard for single residential dwellings, Floor Space Ratio (FSR) and the maximum height. The minimum lot size (density standard) for vacant lot subdivision is 500m^2. The FSR is 0.5:1 and the maximum height is nine metres.

The Master Plan approval allows for 947 residential lots and the Director-General's requirements reflect this number with the proposed lots ranging in size from 340m^2 to in excess of 750m^2. Port Stephens LEP 2000 contains a minimum area for dwellings of 500m^2 in this regard the creation of lots less than 500m^2, where dwellings are not pursued concurrently, would be inconsistent with the LEP. The approved Master Plan shows approximately 600 lots less than 500m^2.

To ensure that the Project Plan application was consistent with LEP 2000, despite the provisions of Part 3A not requiring this, the potential to create super lots was considered. This created further complications as the current proposed amendments to SEPP 71 would require that future subdivision of these lots would be considered through Part 3A of the Act. The proposed requirement that adjoining lots with the same owner in the immediate vicinity not exceed 25 lots would ensure that further subdivision would be individual Part 3A project plans.



Legend

- Fern Bay Seaside Village
- 1(a) 1(a) Rural Agriculture Zone
- 2(a) 2(a) Residential Zone
- 7(a) 7(a) Environment Protection Zone
- 7(c) 7(c) Environment Protection (Water Catchment) Zone

Figure 5.1
Project Plan

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_07		
Date:	10/2/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:			
Scale:	Refer to Scale Bar		

N

0 50 100 150m

Environmental Resources Management Australia Pty Ltd
53 Bonville Avenue, Thornton, NSW 2322
Telephone +61 2 4964 2150

ERM

As there is no concept plan approval in this instance there would be no potential to transfer individual project plans to Part 4 of the Act. If larger lots for further subdivision were to be pursued, to ensure consistency with the Port Stephens LEP, then the process of further subdivision would be onerous given the requirement for further project plans.

The solution to this issue is considered to be the following:

- the Project Plan application should be prepared for 945 residential lots in accordance with the approved Master Plan;

- the Environmental Assessment Report should indicate potential larger lots which can be pursued as integrated housings lots to ensure consistency with Port Stephens LEP 2000;

- the Statement of Commitments contained in *Chapter 9* reflects the land owners intention to pursue small lots as integrated housing development; and

- this will satisfy the requirements of Port Stephens LEP 2000 as dwellings on lots less than 500m^2 will not be pursued individually and unnecessary additional project plans applications will be avoided.

The landowner intends to pursue a new Development Control Plan (DCP) for the next stages of Fern Bay Seaside Village to ensure a high standard of urban design. Initial discussions have been held with Port Stephens Council to develop the new DCP. The DCP would reinforce landscape philosophy, community title design themes and the seaside village character.

The DCP would also develop a framework to ensure that new residential development complies with the aims and objectives of Fern Bay Seaside Village and the local planning guidelines. The client would liaise with Port Stephens Council to develop a planning framework within the DCP to enable dwellings to be classified as either exempted or complying development.

<u>Rural 1(a) Zone</u>

Roads, utility installations, pedestrian trails (which would fall under the definition of either recreation areas or recreation facilities) and bushfire hazard reduction areas are permissible with development consent within the 1(a) Rural Agriculture zone under LEP 2000.

Aspen is supportive of Port Stephens Council to have all of the 1(a) Rural Agriculture zoned land that does not form part of the proposed subdivision to 7(a) Environment Protection to ensure it is protected as an ecological corridor. Aspen would also support the rezoning of the 2(a) Residential zoned land that does not form part of the proposed subdivision to 7(a) Environment Protection.

<u>2(a) Residential Zone</u>

Dwelling-houses, roads, utility installations, pedestrian trails, recreational facilities (which are not defined in LEP 2000) and bushfire hazard reduction areas are permissible with development consent within the 2(a) Residential zone under LEP 2000.

Clause 17 of LEP 2000 specifies that in residential zones:

'(1) A person must not subdivide land in a residential zone except with the consent of the consent authority.

(2) Consent for the subdivision of land to create an allotment with an area of less than 500m² that is, in the opinion of the consent authority, intended to be used for the purpose of residential housing, shall be granted only if consent is granted at the same time for the erection of a dwelling on that allotment.'

When the development application is submitted for the subdivision of the remainder of the site, consent will also be sought for the erection of dwellings on the integrated housing lots, standard and premium villa lots, and those courtyard lots which are less than 500m² in size.

Clause 62 of LEP 2000 specifies that up to one hectare of the site can comprise uses that are permitted with or without development consent within the 3(a) Business General zone. This clause enables commercial/retail premises to be constructed on site within the 2(a) Residential zone.

<u>7(a) Environment Protection</u>

Utility installations, pedestrian trails, hazard reduction areas and clearing are permissible with development consent within the 7(a) Environment Protection zone. Roads are ancillary to permissible uses within the 7(a) zone and are therefore also permissible with development consent within this zone.

Clause 33 of LEP 2000 specifies that a person must not subdivide land within a 7(a) Environment Protection zone except:

'(a) for any of the following purposes:

- *(i) the opening or widening of a public road,*
- *(ii) adjustments to common allotment boundaries,*
- *(iii) consolidation of allotments,*
- *(iv) rectification of any encroachment on any existing allotments,*
- *(v) the creation of allotments corresponding to the parts into which a single allotment is divided by a public road, or*

(b) for the purpose of the creation of an allotment or allotments intended to be used for any one or more of the purposes (excluding dwelling-houses or dual occupancy housing) for which it may be used with or without the consent of the consent authority.'

The proposed public road, drainage infrastructure and pedestrian trails within the 7(a) Environment Protection zone is therefore permissible with development consent.

5.6.2 Zone Objectives

Clause 10(2) of LEP 2000 states that:

'the consent authority must not grant consent for development of land to which this plan applies unless it is satisfied that the proposed development is consistent with the objectives of the zone in which it is intended to be carried out.'

The objectives of each of the 1(a) Rural Agriculture, 2(a) Residential, and 7(a) Environmental Protection zones as set out in LEP 2000 are reproduced below and comments provided.

Rural 1(a) Zone

'The objective of the 1(a) Rural Agriculture "A" zone is to maintain the rural character of the area and to promote the efficient and sustainable utilisation of rural land and resources by:

(a) regulating the development of rural land for purposes other than agriculture by ensuring that development is compatible with rural land uses and does not adversely affect the environment or the amenity of the locality, and

(b) ensuring development will not have a detrimental effect on established agricultural operations or rural activities in the locality, and

(c) preventing the fragmentation of grazing or prime agricultural lands, protecting the agricultural potential of rural land not identified for alternative land use, and minimising the cost to the community of:

(i) fragmented and isolated development of rural land, and
(ii) providing, extending and maintaining public amenities and services, and

(d) protecting and conserving (or both protecting and conserving):

(i) soil stability by controlling development in accordance with land capabilities, and
(ii) trees and other vegetation in environmentally sensitive localities where the conservation of the vegetation is likely to reduce land degradation or biodiversity, and
(iii) water resources, water quality and wetland areas, and their catchments and buffer areas, and
(iv) land effected by acid sulfate soils by controlling development of that land likely to affect drainage or lower the water table or cause soil disturbance, and
(v) valuable deposits of minerals and extractive materials by restricting development that would compromise the efficient extraction of those deposits, and

(e) reducing the incidence of loss of life and damage to property and the environment in localities subject to flooding and to enable uses and developments consistent with flood management practices.'

Roads, associated drainage infrastructure and pedestrian trails are proposed in part of the site zoned 1(a) Rural Agriculture.

The land zoned 1(a) Rural Agriculture is not prime agricultural land and is not currently being used for agricultural purposes, nor is the adjoining rural land to the east. This part of the site zoned 1(a) Rural Agriculture was proposed to provide a buffer for sewerage treatment works that were proposed on Crown land to the east of the site. That proposal has since been abandoned and the land is no longer set aside for that purpose.

2(a) Residential Zone

'The objectives of the Residential "A" zone are:

(a) to encourage a range of residential developments providing for a variety of housing types and designs, densities and associated land uses, with adequate levels of privacy, solar access, open space, visual amenity and services; and

(b) to ensure that infill development has regard to the character of the area on which it is proposed and does not have an unacceptable effect on adjoining land by way of shading, invasion of privacy, noise and the like; and

(c) to provide for non-residential uses that are compatible with the area and service local residents; and

(d) to facilitate an ecologically sustainable approach to residential development by minimising fossil fuel use, protecting environmental assets and providing for a more efficient use of existing infrastructure and services; and

(e) to ensure that the design of residential areas takes into account environmental constraints including soil erosion, flooding and bushfire risk.'

The proposed residential subdivision is consistent with the objectives of the 2(a) Residential zone.

Fern Bay Seaside Village will comprise approximately 683 residential lots (four of which are integrated housing lots with a potential development yield of 84 lots). An additional 182 lots have development consent (149 of which have been developed). As discussed in *Section 5.6*, a variety of residential lot sizes are proposed to provide greater housing choice. The lots are designed and located to maximise solar access and reflect the environmental constraints of the site.

Non-residential uses are also proposed to support the future population of the subdivision including open space areas for passive and active recreation, pedestrian trails, and community, recreation and commercial facilities. Electricity, gas, water, telecommunications and sewerage services will all be

provided to the site and extended to individual lots as the subdivision is developed.

The proposed subdivision has been designed having regard to the principles of ecologically sustainable development and taking into account the environmental constraints of the site. For example, vegetated corridors will be maintained throughout the site, appropriate asset protection zones will be provided for bushfire protection purposes and no development will occur to the east of the hind dune 100 year hazard line.

7(a) Environment Protection

'The objectives of the Environment Protection "A" Zone are to encourage the conservation and proper management of environmentally sensitive land and to ensure that existing and future land uses and land management practices do not detract from the environmental values of the land, and in particular:

(a) to protect significant wildlife habitats, water catchment areas and coastal lands, and

(b) to regulate development to avoid inappropriate uses of land, being uses which would destroy or damage a habitat ecosystem (particularly that of wetlands), significant vegetation or wildlife, and

(c) to promote the regeneration of areas of significant vegetation, and their corridors, for the protection of native fauna and flora species and to maintain their diversity, and

(d) to encourage development compatible with, and sympathetic to, the preservation of the natural environment and based on the principles of ecological sustainable development, and

(e) to regulate development so that it does not adversely affect and is not adversely affected by coastal processes, in both the short and long term, and

(f) to maintain the visual character of coastal landscapes, hillscapes and ridgelines and the availability of land for coastal recreation and access, and

(g) to ensure the sensitive use of renewable resources to maintain the integrity of the resource base and provide for its continued use by future generations, and

(h) to conserve biological diversity and ecological integrity.'

As illustrated in *Figure 2.2*, one small section of roadway as well as parts of the pedestrian trails are proposed to be constructed within the 7(a) Environment Protection zone. This road forms part of the northern access road into the subdivision. This road currently exists as an approved fire trail, providing a second access to the site, which is vital in the event of an emergency, such as a bushfire. The road will reduce the distance future residents of the eastern part of the subdivision will have to travel to enter and exit the subdivision. The location of this road has been selected as it involves

less disturbance of 7(a) zoned land than other potential road locations in this part of the site. The location of the road is consistent with the approved Master Plan. It should also be noted that minimal clearing is required to form overland flow paths as part of the WSUD which is discussed in *Section 7.9*.

Pedestrian trails are proposed around the perimeter of the residential precincts in order to facilitate pedestrian movement throughout the subdivision and to enable residents to experience the surrounding bushland. These trails will be two metres wide and will comprise of natural materials.

5.6.3 Other Applicable Provisions

There are several other clauses of LEP 2000 that are of particular relevance to the site as they set out the principles which Council must have regard to in assessing any development application submitted in relation to this land. These clauses are clause 35(1), 41, 44, 47, 59(1) and 60 of LEP 2000.

Clause 35(1) – Development within all Environment Protection Zones

Clause 35 subclause (1) of LEP 2000 is reproduced below:

'(1) The consent authority must not grant consent to a development application relating to land within an environment protection zone unless it is satisfied that:

(a) the carrying out of the proposed development will not harm or compromise ecological habitats, and

(b) the land is not subject to high bushfire hazard, and

(c) where a dwelling house is permissible on the land (with or without the consent of the consent authority), each allotment to be created by any proposed subdivision has an area of land, suitable for the erection of a dwelling-house, which is not affected by slopes greater than 30%, and

(d) where a dwelling-house or dual occupancy housing is permissible on the land, any proposed building will have a height of no more than 9 metres in the case of a dwelling-house and 8 metres in the case of dual occupancy housing, and

(e) any subdivision will occur in an orderly and efficient manner and will not create undue demands on the provision of services and infrastructure for the locality, and

(f) the land concerned has an adequate area of suitable soils available for on-site septic effluent disposal, located away from drainage lines and shallow or impervious soils, unless reticulated water and sewerage services are available.'

As discussed previously, a section of roadway, drainage infrastructure, and pedestrian trails are proposed to be constructed within the 7(a) Environment

Protection zone, therefore, only subclauses 1(a) and (b) are relevant in this case.

The impact of the proposed subdivision on ecological habitats is assessed in the Species Impact Statement prepared by ERM (2005a). The proposal has the potential to affect a number of threatened species and ecological communities. The most significant impact will be the loss of habitat and habitat resources such as hollow-bearing trees and winter-flowering trees. In order to minimise impacts on the habitat of threatened species, various measures are proposed including:

- retaining a minimum 200 metre vegetated corridor along the northern boundary of the site (which is only to be dissected by the approved southern access road from Nelson Bay Road, an existing electricity line easement, and the proposed northern access road). This corridor will maintain connectivity between the vegetated areas to the north and the south of the site;

- maintaining an ecological corridor along the eastern boundary of the site;

- maintaining a 100 metre buffer area around the powerful owl roost tree that has been identified in the northwestern part of the site; and

- minimising disturbance to certain areas of preferred Koala habitat.

Part of the site access road is proposed to be constructed within the 7(a) Environment Protection zone, which is classified as being of high bush fire hazard. In accordance with Planning for Bush Fire Protection 2006 (NSW Rural Fire Service, 2006), this road will be a two way road with a minimum carriageway of eight metres (kerb to kerb) and a vertical clearance of at least four metres to be maintained above the road at all times.

No buildings are proposed within the 7(a) Environment Protection zone.

Clause 41 – Direct Access to Certain Roads is Restricted

The relevant subclauses of clause 41 of LEP 2000 are reproduced below:

'(1) No new means of vehicular access shall, except with the consent of the consent authority, be opened, constructed, formed, laid out or used from any land adjacent to a boundary of a road identified as follows:

(b) Nelson Bay Road – Main Road 108 (between the intersection of Stockton Street and Church Street, Nelson Bay, and the boundary of Port Stephens local government area at Fern Bay).

(2) Before considering an application for consent required by subclause (1), the consent authority must refer the development proposal to the RTA and take into consideration any comments submitted by the RTA to the consent authority within 28 days of referral of the proposal or such longer as the consent authority may allow.'

A four-way intersection and roundabout has been constructed at the Nelson Bay Road/Fullerton Cove Road intersection to provide access to the site. This intersection and roundabout was approved by the Land and Environment Court of NSW in 1997. The design for this intersection and roundabout has been approved by the NSW Roads and Traffic Authority (RTA). Another intersection is proposed to be constructed on Nelson Bay Road approximately 1.15 kilometres to the northeast of the roundabout. This left-in left-out T-intersection with Nelson Bay Road will provide a secondary access to the subdivision. The consent authority (in this case, the Minister for Planning) must therefore refer the development application for the proposed subdivision to the RTA and consider any comments made by the RTA before determining the application.

Clause 44 – Appearance of Land and Buildings

Clause 44 of LEP 2000 is reproduced as follows:

'(1) The consent authority may consent to the development of land within view of any waterway or adjacent to any main or arterial road, public reserve or land zoned as open space, only if it takes into consideration the probable aesthetic appearance of the proposed building or work or that land when used for the proposed purpose and viewed from that waterway, main or arterial road, public reserve or land zoned as open space.

(2) The consent authority may consent to development of land on or near any ridgeline visible from a public road only if it is satisfied that the development would not be likely to detract substantially from the visual amenity of the locality.

(3) In determining whether to grant a consent referred to in subclause (1) or (2), the consent authority shall consider the following:

(a) the height and location of any building that will result from carrying out the development,

(b) the reflectivity of materials to be used in carrying out the development,

(c) the likely effect of carrying out the development on the stability of the land,

(d) any bushfire hazard,

(e) whether the carrying out of the development is essential to the viability of the land concerned,

(f) the likely extent and effect of carrying out the development on vegetation on the land concerned.'

The site is adjacent to Main Road 108 (Nelson Bay Road). However, views to that part of the site that is proposed to be developed are blocked by a barrier of vegetation and the undulating topography. As previously documented in this report, a minimum 200 metre wide vegetated corridor is proposed to be

retained along the northern boundary of the site adjacent to Nelson Bay Road. Therefore the only views into the subdivision from Nelson Bay Road will be along the two roads leading into the subdivision from Nelson Bay Road.

Views of the site from Stockton Beach and the Tasman Sea are not possible as they are screened by the foredunes.

Clause 47 – Services

Clause 47 of LEP 2000 is reproduced as follows:

'The consent authority shall not grant its consent to the carrying out of any development on any land unless –

(a) a water supply and facilities for the removal or disposal of sewerage and drainage are available to that land, or

(b) arrangements satisfactory to it have been made for the provision of that supply and those facilities.'

The proposed residential subdivision was supported by a Sewer and Water Servicing Strategy prepared by GHD (November 2004). This strategy was approved by Hunter Water Corporation. All existing lots within the subdivision have access to a reticulated water supply. The first two stages of the subdivision are supported by a number of fire hydrants that have been installed to comply with AS2419.1-1994 Fire Hydrant Installation and the requirements of Hunter Water Corporation.

Sewage from the subdivision will be transferred via a rising main which has been constructed along Nelson Bay Road to the existing HWC system at the corner of Rankin Road and Nelson Bay Road. The HWC system is approximately 2.3 kilometres from the Nelson Bay Road and Fullerton Cove Road intersection.

The sewage collection system within the subdivision will involve a combination of conventional and low-pressure systems (grinder sewage pump stations for each lot delivering into a main street network). This strategy will deliver flows that can be accommodated within the allowance provided by HWC for its transfer systems.

The water and sewer servicing strategy for the subdivision has been approved by Hunter Water Corporation.

Clause 59(1) – Development of Known or Potential Archaeological Sites

Clause 59 subclause (1) of LEP 2000 is reproduced below:

'(1) The consent authority may grant consent to the carrying out of development on an archaeological site that has Aboriginal heritage significance (such as a site that is the location of an Aboriginal place or a relic, within the meaning of the National Parks and Wildlife Act 1974) or a potential archaeological site that is reasonably likely to have Aboriginal heritage significance only if:

(a) it has considered an assessment of how the proposed development would affect the conservation of the site and any relic known or reasonably likely to be located at the site, being an assessment prepared in accordance with any guidelines for the time being notified to it by the Director-General of National Parks and Wildlife, and

(b) it has notified the Director-General of its intention to do so and taken into consideration any comments received from the Director-General within 28 days after the notice was sent.'

The Aboriginal Heritage Assessment Report prepared by ERM (2005b) details the impacts of the proposed development on Aboriginal archaeological sites (see *Annex I*). Twenty-five Aboriginal archaeological sites have been recorded within the subject land, including middens, open artefact scatters, a hearth, and a Worimi Cleaver. Those artefacts found along a low ridgeline in the western part of the site have been identified as being of high archaeological significance. The ridgeline is therefore proposed to become a dedicated Cultural Heritage Reserve.

A Section 90 consent with salvage application has been submitted and approved by the Department of Environment and Conservation for sites within the approved subdivision footprint that are outside this ridgeline. Another Section 90 consent with salvage application will be lodged for the other archaeological sites within the remainder of the subject land that is proposed to be developed.

Clause 60 – Development in the Vicinity of Heritage Items, Heritage Conservation Areas, Archaeological Sites or Potential Archaeological Sites

Clause 60 of LEP 2000 is reproduced below:

'The consent authority must take into consideration the likely effect of the proposed development on the heritage significance of a heritage item, heritage conservation area, archaeological site or potential archaeological site, and on its setting, when determining and application for consent to carry out development on land in its vicinity.'

The Aboriginal Heritage Assessment Report prepared by ERM (2005b) details the impacts of the proposed development on Aboriginal archaeological sites (refer to above comments).

5.6.4 Summation

The above demonstrates that the proposed development is consistent with the aims, objectives and statutory requirements of the LEP. It should be noted that there is an area on the north eastern perimeter of the subdivision which encroaches on the land zoned Rural 1(a). In this regard there are no residential lots within the rural zone and the minor encroachment relates to the road. This minor encroachment has previously been endorsed through the approved Master Plan.

5.7 DEVELOPMENT CONTROL PLANS

The Port Stephens Development Control Plan 2007 replaced all of Council's existing Development Control Plans with a single consolidated document that covers all types of development.

The proposed residential subdivision will be surrounded by natural bushland contained within those areas of the site zoned 7(a) Environmental Protection. Proposed bush fire management measures for the subdivision are documented in the Bushfire Hazard Assessment Report (ERM 2009d). These measures have been reviewed in the Addendum Report for the Project Plan application to address the revised guidelines in Planning for Bush Fire Protection 2006 (NSW Rural Fire Service 2006) (see *Annex J*). Public perimeter roads will generally be provided where the subdivision backs onto an area of natural bushland. Short fire trails will be provided in the asset protection zones where a perimeter road is not provided. Appropriate asset protection zones and other bush fire protection measures will be provided in accordance with Planning for Bush Fire Protection (NSW Rural Fire Service, 2006).

Section B of DCP contains requirements that apply to the design of roads. Table B1.3 of DCP specifies minimum road reserve and carriageway widths that apply to urban roads. These minimum road widths are documented in *Table 5.2* along with an assessment of the proposed subdivision's compliance with these minimum standards.

Table 5.2 Minimum Widths of Urban Roads

Class of Road	Lots Dwelling	Carriage-way Width	Total Road Width (including Road Reserve)	Proposed Road Widths in Fern Bay Seaside Village	Compliance
Accessway	< 5	3.5	12.5	N/A	N/A
Cul-de-sac	< 12	5.5	14.5	Variable width but at least 15m wide road reserve	✓
Local Access	12 to 50	6.5	17.5	15m, 17.5m and 20m wide road reserves	part ✓
Collector	50 to 200	8	17	Variable width but at least 17m wide road reserve	✓
Distributor	> 200	11	20	Variable width but at least 17m wide road reserve	part ✓
Bus Route	Major	13	22	Variable width but at least 17m wide road reserve	part ✓

As illustrated in *Table 5.2*the widths of proposed roads within Fern Bay Seaside Village generally comply with DCP B1 Subdivision and Streets although some variations are proposed to the standard road widths required for some of these roads. The proposed roads follow an efficient grid pattern, which provides motorists with a variety of route selection options and thereby promotes dispersed traffic flows.

Rear lanes with six metre wide road reserves are also proposed to be provided at the rear of some of the proposed villa, courtyard and conventional lots. Providing these rear lanes for vehicular access assists in minimising potential pedestrian and vehicle conflict and helps to encourage active street frontages.

In designing the proposed subdivision consideration has been given to the requirements of DCP.

The DCP contains a number of development controls and principles with regards to land subdivision. The principles are:

- to maximise the number of dwelling allotments which have good solar access and therefore which optimise the design performance of energy smart homes; and

- to minimise reliance on private car use.

The DCP provides a number of performance criteria which can be used to demonstrate whether a subdivision achieves these objectives. The performance criteria include the following:

- 80% of lots in the new subdivision have a five star solar access, and the remainder either four or three star;
- lot sizes reflect reasonable consideration of the impact of topography and aspect to maximise solar access;
- lots are of a suitable shape to permit the location of a dwelling with suitable solar access and private open space; and
- design and location of transport links and access facilitate pedestrian and cyclist activity, and the use of public transport.

In designing the proposed subdivision, topography, aspect and lot sizes have been taken into consideration to ensure that solar access is maximised to each residential lot and therefore each future residence as required by DCP. Dwellings will also be designed and located on the lot so as to maximise solar access.

Roads within the subdivision will be designed to encourage both walking and cycling as well as vehicle movements. Pedestrian trails are proposed around the perimeter of the residential precincts in order to facilitate pedestrian movement throughout the subdivision and to enable residents to experience the surrounding bushland. These trails will be two metres wide and will comprise of all weather surface.

The subdivision is proposed to be serviced by a public bus service and both Blue Ribbon Bus Company and Port Stephens Coaches have expressed an interest in providing this service. The proposed bus route is along the main road running through the centre of the subdivision.

5.8 SETTLEMENT STRATEGY

Council's strategic direction for future urban development within Port Stephens LGA is provided in the Port Stephens Urban Settlement Strategy (October 2002). The Strategy identifies the site as a future neighbourhood centre whilst adopted by Council in 2002 this strategy was never endorsed by the Director-General of Planning.

The 2006 Port Stephens Community Settlement and Infrastructure Strategy was placed on public exhibition on 24 October to 4 December 2006. The Strategy builds upon the directions of the 2002 Port Stephens Urban Settlement Strategy and is more detailed in its requirement for future urban development. The strategy identifies Fern Bay Seaside Village as existing residential land. The strategy was formally adopted by Council however the strategy was not been endorsed by the Director-General. The strategy is consistent with the aims and objectives of the Lower Hunter Regional Strategy which is discussed below.

5.9 *LOWER HUNTER REGIONAL STRATEGY*

The plan has been prepared by the State Government to ensure the region of the Lower Hunter develops in a strong and sustainable way. The NSW Government's 25-year land use strategy for the region:

- provides for 115 000 new homes to cater for a projected population growth of 160 000 people;
- plans for up to 66 000 new jobs and ensures an adequate supply of employment land;
- promotes growth in centres — a greater choice of housing and jobs in Newcastle's CBD and specified major centres;
- creates important green corridors of land with high environmental value, which will be managed for conservation purposes. These corridors align with existing public reserves, some of which will be expanded; and
- protects high quality agricultural land, and natural resources such as water aquifers and extractive materials.

The strategy will guide local planning in the five local government areas of Newcastle, Lake Macquarie, Port Stephens, Maitland and Cessnock, and inform decisions on service and infrastructure delivery. The area known as Fern Bay is identified as existing urban land.

5.10 *HUNTER REGIONAL ENVIRONMENTAL PLAN 1989*

The existing adopted regional planning instrument applying to the Hunter region is the Hunter Regional Environmental Plan 1989 (HREP 1989). The main aims of the HREP 1989 are to promote balanced development and to bring about optimum use of land and other resources consistent with the needs and aspiration of the local community. The HREP 1989 identifies the site as being part of an "Investigation Area" for future urban development (refer *Figure 5.2*).

5.11 *OTHER ACTS*

Pursuant to Section 75U of the EP&A Act authorisation for a Part 3A application is not required under the following:

- *Coastal Protection Act 1979*;
- *Heritage Act 1977*;
- *National Park and Wildlife Act 1974*;

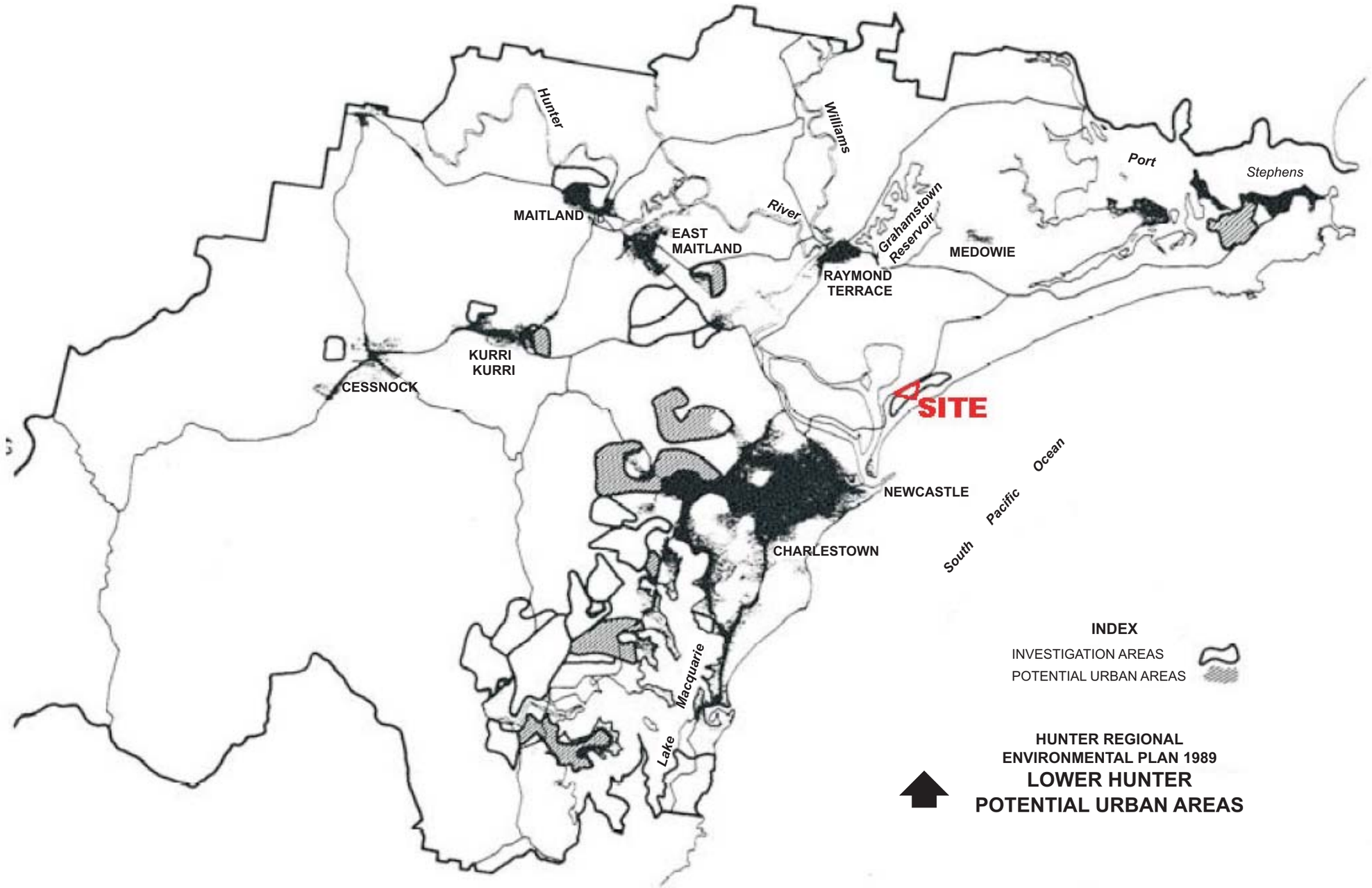


Figure 5.2

Lower Hunter Region Strategy

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_08		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	Hunter Region Environment Plan 1989		
Scale:	Not to Scale		

N

Environmental Resources Management Australia Pty Ltd
53 Bonville Avenue, Thornton, NSW 2322
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ERM

- *Native Vegetation Act 2003*;
- *Rivers and Foreshore Improvement Act 1948*; and
- *Rural Fires Act 1997*.

5.12 NATIVE VEGETATION ACT 2003

The *Native Vegetation Act 2003* (NV Act) commenced on 1 December 2005 and repealed the *Native Vegetation Conservation Act 1997* (NVC Act) which previously governed the management of native vegetation in NSW. The Master Plan submitted in April 2005, considered the applicability of the NVC Act.

The NV Act aims to provide flexibility and incentives for farmers to manage native vegetation, end broadscale clearing (unless it improves or maintains environmental outcomes) and encourage healthy and productive landscapes.

Clause 12 of the NV Act states:

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

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

(b) a property vegetation plan."

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

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

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

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

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

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

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

This means that the provisions of the NV Act do not apply to clearing within that part of the Fern Bay Seaside Village zoned 2(a) – Residential. Section 75U(1) of the EP&A Act specifies that an authorisation referred to in Section 12 of the NV Act to clear native vegetation is not required for an approved

project under Part 3A of the EP&A Act. An authorisation under the NV Act is therefore not required.

5.13 RURAL FIRES ACT 1979

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

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

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

A bush fire hazard assessment had been undertaken by ERM (2005) for the Fern Bay Seaside Village site in accordance with Planning for Bushfire Protection (NSW Rural Fire Service 2001). The previous assessment has been revised in accordance with the current guidelines in Planning for Bush Fire Protection 2006 (NSW Rural Fire Service 2006) (see *Annex L*). However, it should be noted that, in accordance with Section 75U of the EP&A Act, a bush fire safety authority under Section 100B of the RF Act is not required for an approved project under Part 3A of the EP&A Act. Nevertheless, the subdivision has been designed to incorporate the recommendations of the bush fire hazard assessment in relation to asset protection zones, road design and layout, location of water supply and selection of landscaping species. The bush fire hazard assessment report has also made a number of recommendations which have been included in the statement of commitment.

5.14 NSW COASTAL POLICY

In accordance with Clause 92 of the Environmental Planning and Assessment Regulation 2000, the consent authority for the proposed subdivision, in this case, the Minister for Planning is required to consider the NSW Coastal Policy 1997.

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

The Coastal Policy has nine goals which are:

a. *To protect, rehabilitate and improve the natural environment.*

b. *To recognise and accommodate natural processes and climate change.*

c. *To protect and enhance the aesthetic qualities of the coastal zone.*

d. *To protect and conserve cultural heritage.*

e. *To promote ecologically sustainable development and use of resources.*

f. *To provide for ecologically sustainable human settlement.*

g. *To provide for appropriate public access and use.*

h. *To provide information to enable effective management.*

i. *To provide for integrated planning and management.*

Each of these nine goals has several objectives and strategic actions which are listed in Part B of the Policy.

Those objectives that are relevant to the proposed subdivision are listed in *Table 5.3* and comments are provided.

Table 5.3 NSW Coastal Policy Considerations

Objective	Comments
Natural Environment:	
1.2 To conserve the diversity of all native plant and animal species and to protect and assist the recovery of threatened and endangered species.	The impact of the proposed subdivision on ecological habitats is addressed in the Species Impact Statement prepared by ERM in 2005. The proposal has the potential to affect a number of threatened species and ecological communities. The most significant impact will be the loss of habitat and habitat resources such as hollow-bearing trees and winter-flowering trees. In order to minimise impacts on the habitat of threatened species, various measures are proposed including: • retaining a minimum 200 metre wide vegetated corridor along the northern boundary of the site as well as a corridor along the eastern boundary in order to maintain connectivity between the vegetated areas to the north and south and east and west of the site; • maintaining a buffer area of 100 metres around a powerful owl roost tree that has been identified in the northwestern part of the site; and • preventing the disturbance of certain areas of preferred koala habitat. As documented in the Fern Bay Estate Aquatic Assessment (ERM 2005c), no threatened fish or aquatic invertebrates are likely to be affected by the proposed development.
1.3 To improve water quality in coastal and estuarine waters and coastal rivers where it is currently unsatisfactory and to maintain water quality where it is satisfactory.	Various stormwater management measures are proposed including pipe drainage, infiltration trenches, roads with one-way cross-falls, bio-retention swales, gross pollutant traps, infiltration swales and infiltration trenches to minimise impacts on receiving environments.
Natural Processes and Climate Change:	
2.1 To give the impacts of natural processes and hazards a high priority in the planning and management of coastal areas.	Coastal processes and natural hazards that have the potential to impact the subdivision and development of the site include sand dune encroachment, windborne sand, acid sulfate soils, localised flooding and bushfire A hind dune 100 year hazard line traverses the southeastern corner of the site. No development is proposed east of the hind dune 100 year hazard line. The proposed developed area of the subdivision is, at its closest point, over 250 metres

Objective	Comments
	from the current location of the unvegetated areas of the Stockton Beach dune system. The existing vegetation and topography of the site between the proposed development area and unvegetated dunes will prevent windborne sand from having a significant impact on residential areas. Additional landscaping and the installation of barrier fencing will be incorporated into future management measures to minimise the impacts of windborne sand. The southern entrance road and a small area along the southern boundary of the site are mapped as having a probability of containing acid sulfate soils. Geotechnical engineers will be engaged during the preparation of the detailed engineering design plans for road and drainage works, and throughout the construction phase of each stage of the project. Their brief will specifically require testing and reporting of acid sulfate soil conditions prior to the letting of tenders and the preparation of an Acid Sulfate Soil Plan of Management to be incorporated into construction contracts. The Plan of Management will address strategies and procedures to prevent, mitigate or manage potential impacts during site works. The 100 year average recurrence interval (ARI) flood level adjacent to the site is 2 metres Australian Height Datum (AHD) and Port Stephens Council has established a minimum floor level requirement of 2.5 metres AHD for any habitable rooms to be constructed on site. All land within the site used for urban purposes or involving frequent occupation, will be above this minimum level. The majority of the site is regarded as having a high bushfire hazard potential. Appropriate bushfire protection measures, such as asset protection zones and perimeter roads, are proposed to protect life and property. These are detailed in the Bushfire Hazard Assessment (ERM 2009d).
Aesthetic Qualities of the Coastal Zone:	
3.2 To design and locate development to complement the surrounding environment and to recognise good aesthetic qualities.	The subdivision layout has been designed to be sympathetic to the natural environment. Housing within the subdivision will be of a scale, height, form and design that is distinctively coastal, complements the natural setting, and is appropriately located on the lot. Views of the site from Stockton Beach are not possible as they are screened by the

Objective	Comments
	foredune
Protect and Conserve Cultural Heritage:	
4.1 To effectively manage and conserve cultural heritage places, items and landscapes.	Aboriginal archaeological sites have been recorded within the subject land, including middens, open artefact scatters, a hearth, and a Worimi Cleaver. Those artefacts found along a low ridgeline in the western part of the site have been identified as being of high archaeological significance. The ridgeline is therefore proposed to become a dedicated Cultural Heritage Reserve. A Section 90 consent with salvage application has been submitted and approved by DEC for sites within the approved subdivision footprint that are outside this ridgeline. Another Section 90 consent with salvage application will be lodged for the other archaeological sites within the remainder of the subject land that is proposed to be developed.
Ecologically Sustainable Development and Use of Resources:	
5.1 To identify and facilitate opportunities for the sustainable development and use of resources.	The proposal promotes the use of ecologically sustainable development principles for by: • incorporating energy efficient subdivision design; • the adoption of a water sensitive urban design philosophy; • the retention of a significant amount of the site's bushland both in environment protection areas, ecological corridors and areas of open space; • using engineering, architectural and other best practices to reduce development impacts; • protecting Aboriginal archaeological sites of high archaeological significance; • utilising existing service infrastructure; • minimising the degradation of the dune system and coastal vegetation through the provision of a 4WD track to limit beach access; • creating opportunities for public transport usage thereby improving the efficiency of local and regional services; and • providing additional residential land to meet increasing demand.

Objective	Comments
Ecologically Sustainable Human Settlement:	
6.2 To promote compact and contained planned urban development in order to avoid ribbon development, unrelated cluster development and continuous urban areas on the coast.	The site is identified as part of an "investigation area" for future urban development in the Hunter Regional Environmental Plan 1989. It is the only site within this investigation area that has a 2(a) Residential zoning and is likely to be developed for residential purposes. The objective of the proposed development is to create a seaside village nestled within its natural setting that sets a new benchmark in the Hunter region for quality and innovation in the standards of urban design, construction and environmental management. The proposal does not involve ribbon or unrelated cluster development.
6.4 To provide for choice in both housing and lifestyles.	The proposed subdivision will provide approximately 945 residential lots. These lots will be of varying size and will be able to accommodate a variety of housing styles and designs.
Appropriate Public Access and Use:	
7.1 To increase public access to foreshores when feasible and environmentally sustainable options are available.	Vehicular and pedestrian access to the beach from the site is currently via informal trails. A formal four-wheel drive track is proposed to be constructed to provide access from the site to the beach. This track is proposed to be constructed to the standard of a fire trail.

6 GENERAL ENVIRONMENTAL RISK ANALYSIS

6.1 BACKGROUND

The aim of this analysis is to identify all key environmental risk factors relevant to the project. This ensures the scope of this assessment is appropriate.

6.2 RISK ASSESSMENT

The risk assessment has been identified through the number of specialist reports that have been prepared for the Master Plan. These reports have been updated to reflect changes in the legislation.

The following key environmental impacts were identified and are subject to further specific technical assessments:

- ecological impacts: Ecology Assessment Report (ERM 2004a);
- traffic impacts related to the increase in traffic generation from the site, during both construction and operational phases, addressed by ERM (2006); and
- an archaeology impact assessment identified a number of significant sites throughout the area.

Mitigation measures identified in the risk assessment are incorporated into the draft Statement of Commitments for consideration by the Department of Planning.

The potential environmental risks associated with the proposed development are contained in *Table 6.1* and are subsequently addressed in the next chapter of this Environmental Assessment Report.

Table 6.1 Environmental Risk Analysis

Environmental Aspect	Environmental Impact	Environmental Risk Rating
Water Quality	• Large increase in impervious surfaces, including roads and infrastructure • Water pollution associated with runoff from development	• Medium
Heritage Indigenous	• Destruction of items, objects of significance as a result of the proposed subdivision	• Medium
Design and Visual Amenity	• Impact on the scenic quality of Fern Bay	• Low
Acid Sulfate Soil	• Soil works may activate potential acid sulfate soils	• Low
Waste Water Disposal	• The proposed residential subdivision was supported by a Sewer and Water Servicing Strategy prepared by GHD (November 2004)	• Low
Flora and Fauna	• Potential impact on endangered ecological communities • Potential impact on endangered flora and fauna	• Medium
Traffic and Transport	• Increase traffic volumes • Potential impact on Nelson Bay Road	• Medium
Site Contamination	• Potential contamination from previous activities • Potential contamination from proposed development	• Low
Impacts on Adjoining lands	• Potential impact on adjoining land	• Low
Coastal Zone Management	• Potential impact from rising sea levels	• Low
Bushfire	• Potential impact from bushfire	• Medium
Flooding	• Low lying land to the south of Nelson Bay Road	• Low

The key opportunities and constraints of the site have been identified and have influenced the design. These include:

- only the 2 (a) residential areas will be developed for residential purposes;
- the existing vegetation within the 7 (a) Environmental Protection areas of the site needs to be protected and carefully managed;
- the site's sandy soils have high infiltration rates;
- a 100 metre buffer needs to be retained around the Powerful Owl roost tree in which no clearing or disturbance will be permitted;

- ecological corridors need to be maintained running north and south and east west through the site;
- the site supports both preferred and supplementary Koala habitat;
- the low ridgeline in the western part of the site will not be developed to ensure appropriate protection is given to the site's cultural significance;
- any flooding on site from the Hunter River system will be confined to the existing swamp forest areas adjacent to Nelson Bay Road;
- no development should occur to the east of the 100 year hind dune hazard line;
- appropriate asset protection zones need to be provided around the perimeter of any residential development proposed on site in order to protect property and people from the effects of bushfire; and
- views into the site are obscured by existing vegetation and the topography of the site and surrounds.

7 ASSESSMENT OF KEY ISSUES

7.1 GENERAL CONSISTENCY WITH THE APPROVED MASTER PLAN

The proposed subdivision design is consistent with the approved Master Plan which was endorsed by the Minister of Planning on 8 August 2006 (No MP 20-4-2005).

The proposed subdivision layout is consistent with the approved Master Plan with the changes being minor in nature in relations to the number of lots and the breakdown of lot sizes. A discussion of the consistency with the Master Plan is contained in *Section 2.4* and *Annex C.*

7.2 DESIGN AND VISUAL IMPACTS

Views into the site from Nelson Bay Road are blocked by a barrier of coastal forest and prominently undulating dunes. Views to and from adjoining land are also obscured by vegetation and the topography. Views of the site are not available from Stockton Beach as they are screened by existing sand dunes.

7.3 SOCIAL AND COMMUNITY

This section highlights some of the key characteristics of the Fern Bay Planning District community profile, provides details of likely future residents and investors within the subdivision, and assesses the socio-economic impacts of the proposal.

7.3.1 *Existing Community Profile*

At the 2001 ABS Census, the Fern Bay Planning District had a population of 879. Council predicts the population of the Fern Bay Planning District to reach 1100 by the year 2005, 1500 by 2010 and 4500 by 2032 (Port Stephens Council 2004). These figures assume that the areas of the site zoned Residential 2(a) will be developed for residential purposes.

In 2001, the median age of residents within the Fern Bay Planning District was 39 years and 58.7% of the Planning District was aged below 24 years of age. The vast majority (approximately 85%) of residents within the Fern Bay Planning District are Australian born (Port Stephens Council, 2004).

The Fern Bay area is in close proximity to central Newcastle and employment opportunities to which it has a good public transport link via a bus service. At the 2001 ABS Census, 75% of the Fern Bay labour force worked in Newcastle

LGA, 13% worked in Port Stephens LGA and the remaining 12% worked elsewhere in the Lower Hunter.

In 2001 the majority of dwellings (75%) within the Fern Bay area consisted of a single detached house. However, this is expected to change over the next ten years according to recent research into household formation conducted by Colleen Coyne Property Research on behalf of Landcom. According to this research, it is estimated that households likely to be formed over the next ten years in the Lower Hunter (which includes the Fern Bay area) will be as follows:

- 20% single person households;
- 30% households with children; and
- 50% couples only households.

These figures are based on the ageing population and declining fertility rates.

On the basis of this research it has been estimated that the breakdown of dwelling type in the Lower Hunter over the next ten years will be as follows:

- 10% one bedroom dwellings with one garage;
- 10% two bedroom dwellings with two garages;
- 5% two bedroom dwellings with one garage;
- 20% three bedroom dwellings with two garages; and
- 55% four bedroom dwellings with two garages.

The trend of smaller household formation is not being accompanied by demand for smaller dwellings. However, there is likely to be strong demand for more compact dwellings on smaller lots with corresponding smaller gardens that require less maintenance. This may translate to detached dwellings on small lots, zero lot housing and medium density development.

The mix of allotments proposed within Fern Bay Seaside Village has been influenced by the change in household formation and dwelling demand that is expected to occur over the next ten years.

7.3.2 Future Residents and Investors

The Social-Economic Impact Assessment Report prepared for the Master Plan study (ERM 2005d) identified that people that are likely to purchase properties within Fern Bay Seaside Village and which will be targeted through marketing campaigns are existing owner-occupiers and investors.

The majority of owner-occupiers are expected to be:

- Newcastle residents;
- educated (having a diploma or a degree);
- currently paying off their home;
- young families and mid-life families with two children that are looking to upgrade the family home or socially aware people looking for a sea change;
- mainly between 35 and 49 years of age;
- married with 60% having children; and
- high income households.

The majority of investors are expected to be:

- Newcastle residents;
- educated (having a diploma or a degree);
- people who currently have a real estate investment;
- mainly between 50 to 64 years of age; and
- high income households with 55% of households having no children at home (possibly because the children have left the household).

7.4 SOCIO-ECONOMIC IMPACTS OF THE PROPOSAL

7.4.1 Socio-Economic Benefits

The key socio-economic benefits of the proposed residential subdivision include:

- the supply of additional residential lots;
- the supply of additional infrastructure services to the area and the more efficient use of existing infrastructure; and
- the provision and more efficient use of existing social infrastructure and recreation and community facilities.

Additional Residential Lots

The Lower Hunter Regional Strategy (LHRS) is the principal regional environmental planning strategy applying to the Hunter region. The HREP 1989 identifies the site as being part of an "Investigation Area" for urban development. It is the only site within this investigation area that has a 2(a) Residential zoning and is currently being developed for residential purposes.

Council's strategic direction for future urban development within the Port Stephens LGA is provided in the Port Stephens Urban Settlement Strategy. The Strategy highlights that the Port Stephens local government area is highly constrained by topography and environmentally sensitive land and that demand for housing is likely to outstrip the supply for residential land throughout the area in the next decade or two. The site is identified in the Strategy as a "future neighbourhood centre" within the Fern Bay Planning District. It is important that this land is developed for residential purposes; otherwise certain components of Council's Strategy will not be achieved.

Once Fern Bay Seaside Village is developed, it will increase the available housing stock in the area by approximately 945 dwellings. This will assist in meeting some of the increasing demand for residential land within the Port Stephens and Newcastle local government areas.

As discussed in *Section 1.3*, the proposed residential lots within the subdivision will vary in size and will be able to accommodate a variety of housing styles and designs. Lot sizes and configurations have been specifically designed to support a wide range of housing types. This will provide potential residents with a greater choice of housing.

Additional Infrastructure Services and More Efficient Use of Existing Infrastructure

Electricity, gas and telecommunications are available in the area for connection to the site.

The proposed residential subdivision was supported by a Sewer and Water Servicing Strategy prepared by GHD (November 2004). This strategy was approved by Hunter Water Corporation. All existing lots within the subdivision have access to reticulated water and sewer facilities. The village is supported by a number of Fire Hydrants that have been installed to comply with AS2419.1-1994 Fire Hydrant Installation and the requirements of Hunter Water Corporation.

The sewage collection system within the subdivision involved a combination of conventional and low-pressure systems (grinder sewage pump stations for each lot delivering into a main street network). This strategy will deliver flows that can be accommodated within the allowance provided by HWC for its transfer systems.

The proposed residential subdivision will therefore utilise existing electricity, gas and telecommunications services in the area, which is consistent with the principles of ecologically sustainable development. The proposal has also improved water and sewerage disposal infrastructure provision in the area, which will benefit the wider community.

Given the residential zoning over a significant part of the site, service authorities have anticipated that part of this land would be developed for residential purposes and have planned accordingly.

Social Infrastructure, Recreation and Community Facilities

The 30 Year Plan for Port Stephens (Port Stephens Council 2000) provides a vision for the long term planning of the Port Stephens LGA. The document outlines actions that will assist in achieving this vision. One of the aims of this document is *'to protect and enhance the social well-being of people who live, work and holiday in Port Stephens'*. The Plan identifies that in order to achieve this aim it is necessary to ensure that community facilities and services exist and are accessible to all members of the community.

The proposed subdivision and development of part of the site for residential purposes will result in an increase in the population of the area and a corresponding increase in demand for certain facilities, services and infrastructure. This will include increased demand for recreational facilities (such as sports fields), schools, health infrastructure (such as hospitals), emergency services (such as ambulance, fire and police), public transport, open space, community facilities (such as neighbourhood and child care centres and libraries), and bus shelters amongst others.

Some of these facilities, including open space areas, pedestrian trails, barbeques, picnic shelters and children's play equipment are proposed to be provided within Fern Bay Seaside Village. Existing bus services in the area are also proposed to be extended to service the subdivision. The developers of the subdivision will also pay section 94 contributions towards the provision of public facilities and services in accordance with the Fern Bay Section 94 Plan No. 8. At the time of writing this report Port Stephens Council had exhibited a plan but not adopted a revised contribution plan.

Retail, commercial, community and recreational facilities and services are provided at Fern Bay approximately one kilometre to the south of the site and Stockton approximately six kilometres to the south of the site. Community facilities and services currently available to the Fern Bay area include:

- a bus transport service;
- Fern Bay Public School (infants only); and
- a mobile library which visits Fern Bay each fortnight.

Current facilities and services at Stockton include:

- an early childhood centre (baby health);
- a government pre-school;
- Stockton Primary School;
- family day care;
- a medical centre;
- a mental health facility;
- meals on wheels;
- a nursing home (Westcott);
- five churches;
- Scouts and Girl Guides community halls;
- aged day care;
- sporting ovals, tennis courts, a skate park, a public swimming pool and other sporting facilities;
- a Surf Life Saving Club and a patrolled beach;
- a library;
- a bus transport service; and
- a ferry service which provides transport between Stockton and Newcastle.

Ambulance, fire and police services are available at Stockton although a police station is not located at Stockton.

With regards to other educational institutions in the area:

- Williamtown Primary School is approximately six kilometres to the north of the site;
- Newcastle High School is approximately nine kilometres to the southwest of the site; and
- Newcastle TAFE is approximately 10 kilometres to the southwest of the site.

The NSW Department of Education and Training has advised that a primary school would not be required on the site to service the future residents as the existing primary schools at Fern Bay and Stockton would be able to accommodate the expected increase in enrolments. The approved Master Plan did not allocate area for the provisions of a school.

The future residents would therefore have access to retail, commercial, community and recreational facilities. By using the existing facilities and services provided at Fern Bay and Stockton the future residents of the subdivision would assist in strengthening the social and economic viability of these areas.

Commercial/Retail Demand

A previous assessment of the requirements for commercial/retail floorspace associated with the development of the Fern Bay Seaside Village site was undertaken in 1992 (Urbec Consultants) for Port Stephens Council. This study identified a total requirement for commercially zoned land within the Fern Bay site of 8.5 hectares.

A review of the 1992 study has been undertaken by HillPDA Consulting (2008) (refer to *Annex U*) to assess the local changes that have occurred since the preparation of the 1992 study, identify changes to relevant planning strategies, markets and retail trends and identify potential appropriate degrees of floorspace provision of the Fern Bay Seaside Village. The findings of the review are detailed below.

- the 1992 study identified the Fern Bay site as a 438 hectare site (comprising the proposed Fern Bay Seaside Village including the adjacent conservation areas) and an extension site of 350 hectares comprising the former Stockton Riffle Range and land owned by Boral. The land in total was identified as having a potential to yield up to 4800 to 5000 households by 2026, from which the commercial / retail requirements were based upon.

- significant changes have occurred since the preparation of the 1992 study, resulting in the quantum of retail and commercial floorspace required in Fern Bay also changing. These changes include:

    - the size of the residential development at Fern Bay Seaside Village has been reduced significantly, ie. the combined site has been reduced from 788 ha to 250 ha (of which 136 ha is developable for residential purposes);

    - the proposed development of Fern Bay Seaside Village will now result in 2500 residents, and not 9800 (75% less than expected);

    - wider population forecasts have shown decreasing trends, rather than increasing trends forecasted in the 1992 report;

    - household occupancy rates have decreased; and

    - the quantum of commercial floorspace requested was calculated on the basis on the completed and occupied development of 833 hectares of land and the significant growth of the local population, none of which has occurred.

The Department of Planning's Lower Hunter Regional Strategy identifies a centre hierarchy for commercial areas. The 8.5 hectares of commercial/retail floorspace required by the 1992 study would result in Fern Bay becoming a 'town centre'. The Strategy defines a town centre as supporting between 4500 and 9500 dwellings. The proposed Fern Bay Seaside Village will provide approximately 1000 additional dwellings to Fern Bay, significantly less than original assessments. The provision of 8.5 ha of floor space that cannot be supported by the local market is not considered in the interests of the Fern Bay community. This concern is likely to be compounded by the fact that the site is located off a main road and does not have a high level of road visibility or passing trade.

The 1992 study did not assess the economic impact additional retail of the scale requested would have to existing surrounding centres of retail/commercial uses in centres such as Stockton, Mayfield, Jesmond, Medowie, Raymond Terrace or Newcastle CBD and the commercial areas required for the Newcastle Airport/RAAF Base Williamtown area;

Notwithstanding the above, it is recognised that new residential developments should provide an appropriate degree of retail and commercial facilities on site in accordance with the level of demand generated. Retail and commercial facilities should be provided locally not the least to provide convenient, accessible services that minimise the need to drive. A preliminary estimate on the reasonable proportion of retail floorspace to be provided in light of the revised scale of the Fern Bay Seaside Village and its development timeframe is the provision of 1200 to 1400m^2 of convenience retail and commercial floorspace. It is considered that this would provide accessible retail and commercial facilities within walking distance of future occupiers of the site. This would also create an environmentally sustainable form of development in accordance with the objectives of the Lower Hunter regional Strategy. Plan 1 of 18 in *Annex B* identifies the location of the commercial areas within the Fern Bay Seaside Village. The area provided for commercial/retail development is 2666m^2.

Other Benefits

The proposed development of part of the site will provide short-term employment during the civil works and housing construction phases and longer-term employment arising from the demands generated by additional people settling in the area. This will result in greater retail expenditure and support for local retail and community facilities in Fern Bay and Stockton.

The total civil construction cost for the proposed development is expected to be in the order of $30 million and the total housing construction cost is expected to be in the order of $190 million. Based on the Housing Industry Association's Multiplier Effect Fact Sheet and total housing construction costs in the order of $190 million, the proposed development is expected to create in the order of 2470 jobs during the housing construction phases of the village. This is in addition to the jobs that will be created during the civil works

construction phases. During the housing construction phases the proposal is also expected to generate over $35 million per annum of additional expenditure in the local economy (based on the Housing Industry Association's Multiplier Effect Fact Sheet and annual housing construction costs in the order of $190 million). Once again this is in addition to the expenditure that will be generated during the civil works construction phases.

7.4.2 Impacts

The main potential negative socio-economic impacts associated with the proposed residential subdivision include:

- increased demand on existing community facilities and services in Fern Bay and Stockton;
- increased demand for beach access through the site and disturbance of the dunes and coastal vegetation;
- disturbance of Aboriginal archaeological sites; and
- increased traffic.

These are discussed individually below.

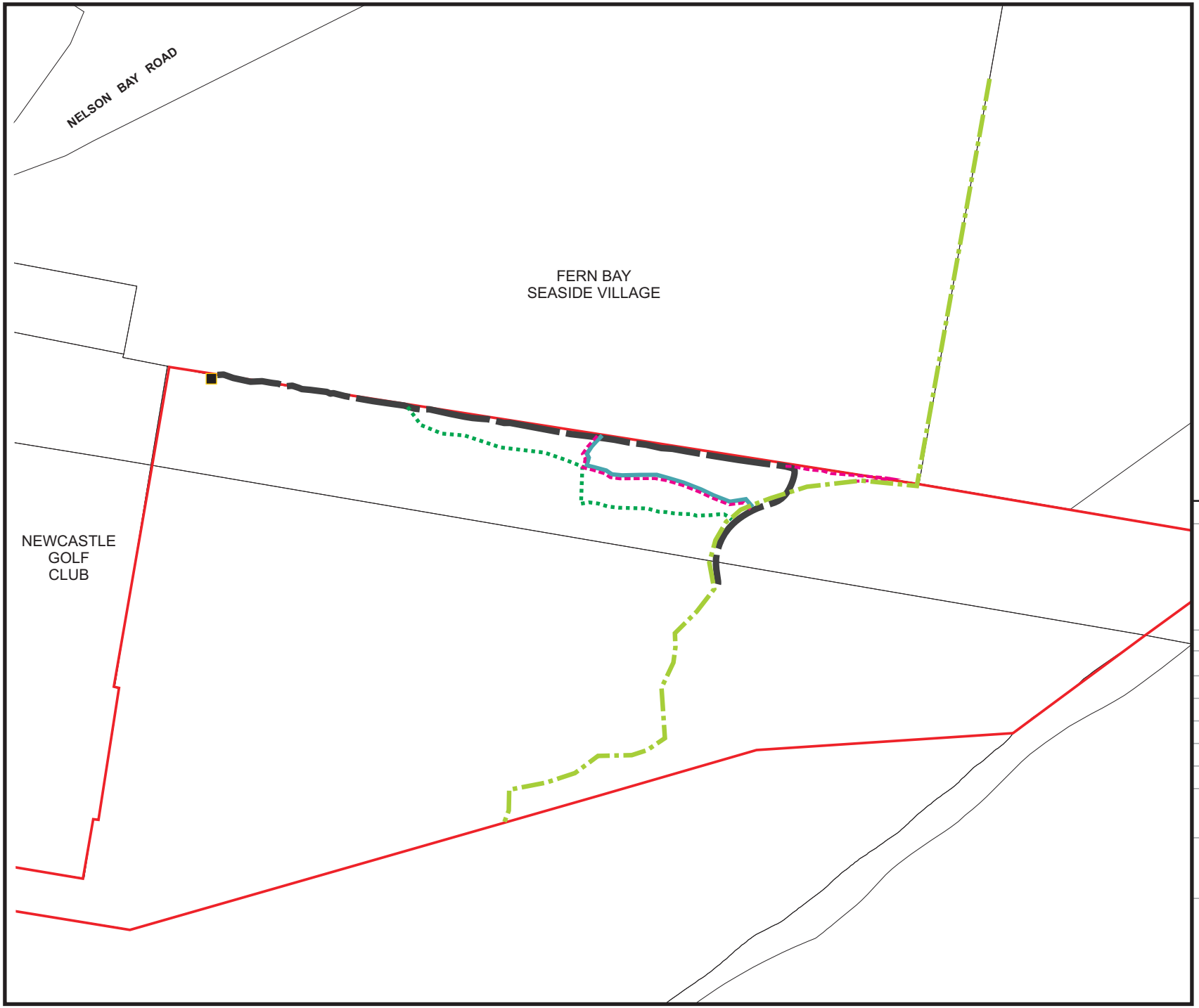
Increased Demand on Existing Community Facilities and Services

As discussed in this report, to meet the increased demand for community facilities and services the developers of the site will provide some of these facilities and services on site and will also pay Section 94 contributions towards their provision.

Increased Demand for Beach Access and Disturbance of the Dunes and Coastal Vegetation

The development of the subdivision is likely to increase the demand for public access to Stockton Beach for both future residents and the general public. Increased access may in turn result in further disturbance of the dunes and coastal vegetation.

Vehicular and pedestrian access to the beach from the site is currently via informal trails. A formal four-wheel drive track is proposed to be constructed adjacent to the Fern Bay Seaside Village and within the Worimi Regional Park to provide access from the site to the beach. The proposed location of the four-wheel drive (4WD) track is identified in *Figure 7.1*. Approval for the track is not being sought under this development proposal and will be subject to a separate approval under Part 5 of the EP&A Act. The Department of Environment and Conservation (DEC), now known as the Department of Environment and Climate Change (DECC), has advised that they will consider the construction of a four-wheel drive track (to the standard of a fire trail) over DECC managed land to the south of the site. This track will be



Legend

Formalised Access:

- Four-wheel Drive Track
- Walking Track
- Bollard Fencing
- Car Park (approx. 20 x 20m)

Figure 7.1

Proposed Four-Wheel Drive Track

Client:	Aspen Group		
Project:	Fern Bay Seaside Village		
Drawing No:	0065580hv_planning_18		
Date:	10/02/09	Drawing size:	A4
Drawn by:	SP	Reviewed by:	NB
Source:	-		
Scale:	Refer to Scale Bar		

N

0 100 200 300m

Environmental Resources Management Australia Pty Ltd
53 Bonville Avenue, Thornton, NSW 2322
Telephone +61 2 4964 2150

ERM

accessed from within the subdivision. The exact location of this track and construction details are still to be confirmed. By limiting beach access to this four-wheel drive track, as opposed to the many informal tracks, the impact on the dunes and coastal vegetation will be minimised and may over time be reduced.

There are currently no patrolled swimming areas along Stockton Beach in the immediate vicinity of the site. The closest patrolled beach is at Stockton, approximately five kilometres to the south of the site. The area of Stockton Beach and the Tasman Sea adjacent to the site is therefore likely to be used for four-wheel driving and recreational fishing as opposed to swimming. It is expected that residents of the subdivision will travel to the patrolled area of Stockton Beach for swimming.

Disturbance of Aboriginal Archaeological Sites

Twenty-five Aboriginal archaeological sites have been recorded within the site, including middens, open artefact scatters, a hearth, and a Worimi Cleaver (refer to *Annex I*). Those artefacts found along a low ridgeline in the western part of the site have been identified as being of high archaeological significance. The ridgeline is therefore proposed to become a dedicated Cultural Heritage Reserve. This will ensure that appropriate significance is given to the site's cultural heritage. A Section 90 consent with salvage application has been submitted and approved by the Department of Environment and Conservation, now known as the Department of Environment and Climate Change, for sites within the approved subdivision footprint that are outside this ridgeline. A condition of this section 90 consent stipulated that additional excavations be undertaken. This excavation and salvage work was carried out in October 2004 and will be reported to DECC. Another Section 90 consent with salvage application will be lodged for the other archaeological sites within the remainder of the site that is proposed to be developed.

Increased Traffic

As documented in the Fern Bay Estate Traffic Impact Assessment Report (ERM 2009e), when Fern Bay Seaside Village is fully developed it will result in an increase in traffic volumes along Nelson Bay Road and other roads in the local road network. The traffic increase on Nelson Bay Road is predicted to result in a maximum of 3166 additional daily vehicle movements to the south of the site and 1357 additional daily vehicle movements to the north.

In percentage terms, the future traffic increase in comparison to the base year 2014 traffic volumes will be noticeable (typically over five percent) over a wide area as far as the Tourle Street Bridge, sections of Nelson Bay Road, Medowie Road and Cabbage Tree Road, to the east, north and west of Williamtown. However, there will be no change in the level of service of

affected roads as a result of the proposed development based on a comparison between 2014 projected traffic flows pre- and post development.

Traffic modelling results indicate the proposed southern site access intersection with Fullerton Cove Road/Nelson Bay Road (a four-way roundabout) will all operate at a Level of Service 'B' with slight delays and spare capacity. This level of service is significantly better than the Level of Service 'F' predicted in 2014 with the existing T intersection. The northern site access intersection with Nelson Bay Road (left turn access only) will operate at a Level of Service 'A' with minimal delays when the site is fully developed.

7.4.3 Summation of Socio-Economic Impacts

The Hunter Regional Environmental Plan 1989 identifies the site as being part of an "Investigation Area" for urban development. It is the only site within this investigation area that has a 2(a) Residential zoning and is currently being developed for residential purposes. The development of part of the site for residential purposes is also consistent with the Port Stephens Urban Housing Strategy (Port Stephens Council 2007) which recognises the site as a "future neighbourhood centre".

Fern Bay Seaside Village will have a positive socio-economic impact on the local and regional community through the supply of additional residential land and the provision of a variety of housing stock, which will assist in meeting some of the increasing demand for housing in the area. It will involve the utilisation of existing service infrastructure and will also provide additional service infrastructure and community facilities (either directly or via Section 94 contributions), which will benefit the wider community.

Approximately 2470 jobs are expected to be generated during the housing construction phases of the subdivision. This is in addition to the jobs that will be created during the civil works construction phases. The housing construction phases are also expected to generate over $35 million per annum of additional expenditure in the local economy. This is on top of the expenditure that will be generated during the civil works construction phases.

Potential negative socio-economic impacts include the increased need for public facilities and beach access, potential disturbance of the neighbouring dunes and coastal vegetation, an increase in local traffic and disturbance of Aboriginal archaeological sites. These impacts are not likely to be significant and can be adequately mitigated.

Overall, the socio-economic benefits of the proposed subdivision are considered to outweigh the potential negative socio-economic impacts.

7.4.4 Section 94 Contributions

Port Stephens Council has adopted a revised contributions plan titled Section 94 Development Contributions Plan 2007. This document includes the

background detail and schedules of proposed facilities which provide the basis to the Council's single Council wide contribution figure $10,479 per lot.

There have been discussions between Port Stephens Council and Newcastle City Council as to the impact that Fern Bay Seaside Village would have on local facilities regardless of local government boundaries. In this regard Port Stephens revised contribution plan has been drafted such that monies collected can be spent outside of the Port Stephens local government area. A dialogue has commenced between the two Councils in relation to establishing a process to ensure any monies collected are appropriately spent

The contribution plan also includes Section 2.3.6 of the Plan which enables the applicant to provide "in kind" contribution in lieu of satisfying the financial obligations of the plan. In this regard a schedule of proposed community and recreation facilities has been provided to Council so as consideration can be given as to the material public benefit. These facilities are further discussed below and are detailed in *Table 7.1*.

Fern Bay Seaside Village incorporates a large turfed Village Green of 5000m^2 which has been completed at the entrance to the development that will allow a range of activities to be pursued. Amenities include two gas barbeques, bench seats and picnic tables, a timber pavilion and solar lighting.

There will be three playgrounds developed within the subdivision, each having a range of play equipment installed. The Village Green Children's Playground was completed in 2008 and includes junior play equipment, tricycle track, seating and further landscaping. The Village Green Advanced Playground will be finished in 2009 and will include an advanced children's playground, associated softball surface, further seating and solar lighting.

It is strongly considered that there would be no demand for more structured facilities at Fern Bay, such as a more extensive oval or cricket pitch. Further development of the site would also have encroached upon the natural values of the present development.

The Fern Bay Seaside Village lies in a unique coastal setting that provides a myriad number of passive recreation opportunities. As part of the Fern Bay development, a series of cycleways, boardwalks and walking and running trails will be developed around the subdivision and through the surrounding bushland. The native bushland setting will be conducive to a range of passive activities, including bushwalking, bird watching and the greater appreciation of nature. This will be facilitated by a total 53% of the site being retained in a natural state. The potential also exists for the development of picnic areas and interpretive trails that will allow an even greater appreciation of the Australian bush.

A 1.2 kilometre four-wheel drive track will be provided between the subdivision and Stockton Beach (see *Figure 7.1*). The track will be of a standard of graded sand and will be sealed in the steeper areas. It will be suitable for four-wheel drives only. A formal carpark will be constructed at

the commencement of the track and at the rear dune termination point. Solar lighting will be installed at the car park. A parallel walking track will also be constructed.

Table 7.1 Proposed Community and Recreation Facilities

Facility	Material Public Benefit	Value to Council	Saving to Council
Cultural Heritage Reserve	Site for the aboriginal heritage area to be maintained by the Community Association This will be a reserve with access available to the general public	Land & embellishments value	No construction costs, no maintenance costs and no depreciation
Community Building of 150 m^2 and carpark	The community building will be available for public use and managed by the Community Title Association	Construction costs	No construction costs, no maintenance costs and no depreciation
Cabbage Tree Park – 2.4 ha this includes 5000 $m^2$of mini oval Amenities including two gas BBQs, bench seats, picnic tables, timber pavilion and solar lighting. Child play equipment	The park will be available for public use and will be maintained by the community association.	Land Value & cost of construction & facilities	No construction costs, no maintenance costs and no depreciation
Corymbia Park – 1.09ha Amenities will include child play equipment, seating and picnic tables	The park will be available for public use and will be maintained by the community association.	Land Value & cost of construction & facilities	No construction costs, no maintenance costs and no depreciation
Banksia Park – 1.54ha which includes the area for the community building. Amenities will include child play equipment, seating and picnic tables	The park will be available for public use and will be maintained by the community association.	Land Value & cost of construction & facilities	No construction costs, no maintenance costs and no depreciation
Cycle-ways, boardwalks and walking and running trails throughout the bushland	These facilities will be available for public use and will be maintained by the community association.	Construction costs	No construction costs, no maintenance costs and no depreciation

Facility	Material Public Benefit	Value to Council	Saving to Council
Picnic areas and interpretive trails.	These facilities will be available for public use and will be maintained by the community association.	Construction costs	No construction costs, no maintenance costs and no depreciation
Shared footway cycleway from Roundabout at Nelson Bay Road to Bus Shelter at Bayway Village	This facility will be constructed in the road reserve and available for public use	Construction costs	No construction costs.
A 1.2 kilometre 4WD access road located on DECC land with associated safety fencing	The access road will be provided for public use as part of the compensation package agreed with DECC. There is a material public benefit in the provision of this facility.	Approval and construction costs	Benefits to both the community and environment in the proposed works
A formal carpark on DECC land in association with the track with Solar lighting installed.	The carpark and lighting will be provided for public use as part of the compensation package agreed with DECC. There is a material public benefit in the provision of this facility.	Approval and construction costs	Benefits to both the community and environment in the proposed works
A walking track on DECC land with associated safety fencing.	The walking track will be provided for public use as part of the compensation package agreed with DECC. There is a material public benefit in the provision of this facility.	Approval and construction costs	Benefits to both the community and environment in the proposed works
Offsite Compensation Package in DECC land	As per agreement	Landscape rehabilitation and maintenance	Communities benefit for Regional park

7.5 *TRAFFIC AND ACCESS*

A Traffic Impact Assessment report was prepared and a copy is contained in *Annex M*. This report identifies the existing road network, utilises road volume data, considers the impacts on intersection and reviews the proposed road network.

The site is currently accessed via a four lane roundabout off Nelson Bay Road. The RTA has also approved a second access onto Nelson Bay Road. The northern site access intersection with Nelson Bay Road will be left in/left out only to facilitate vehicle movements and maintain the existing traffic flows along Nelson Bay Road

The RTA were consulted through the preparation of the Council DCP (subsequently repealed) and also through the approval process for the fire trail access to Nelson Bay Road. This fire trail has been constructed on the alignment for the future access road. The RTA stipulated left in/left out access only due to the proposed Nelson Bay Road upgrading to a divided dual carriageway.

The proposed road hierarchy for the subdivision includes:

- a collector road through the centre of the subdivision with a variable road reserve width, the minimum width being 17 metres;
- perimeter roads with widths varying from 15 to 20 metres;
- neighbourhood street with road reserve widths varying from 15 to 20 metres; and,
- fire trails with trafficable width of 4 metres.

The collector road will act as the main transport route through the subdivision and will provide access to community facilities and key areas of open space.

The perimeter roads will abut environment protection and open space areas to define the boundary of residential development. This will also provide asset protection zones for bush fire management.

The neighbourhood streets will provide access to residences, community and recreational facilities as well as open space. Bio-retention swales will be included in the road reserves of these streets in keeping with the principles of water sensitive urban design.

Fern Bay Seaside Village will result in an increase in traffic volumes along Nelson Bay Road and other roads in the local road network. The traffic increase on Nelson Bay Road is predicted to result in a maximum of 3166 additional daily vehicle movements to the southwest of the site and 1357 additional daily vehicle movements to the northeast.

In percentage terms, the future traffic increase in comparison to the base year 2014 traffic volumes will be noticeable (typically over five percent) over a wide area as far as the Tourle Street Bridge, nearby sections of Nelson Bay Road, Fullerton Road and Cabbage Tree Road. However, there will be no change in the level of service of affected roads as a result of the proposed development based on a comparison between 2014 projected traffic flows pre and post development.

The RTA and Port Stephens and Newcastle Councils have concept plans in place to account for future traffic growth in the area. This proposed development is consistent with what is envisaged in these plans.

Traffic modelling results indicate the proposed southern site access intersection with Fullerton Cove Road/Nelson Bay Road (a four-way roundabout) will all operate at a Level of Service 'B' with slight delays and spare capacity. The Level of Service with a four-lane roundabout will significantly improve from predicted 2014 conditions for the existing T-intersection where under peak hour conditions a Level of Service 'F' prevails. This large delay was due to traffic turning from Fullerton Cove Road into Nelson Bay Road. This roundabout has been approved by the RTA and is currently under construction.

The northern site access intersection with Nelson Bay Road (left turn access only) will operate at a Level of Service 'A' with minimal delays when the site is fully developed.

The road conceptual design makes adequate provision for future bus routes along the internal collector road network. The proposed bus route location is detailed in Figure 4.1 of the Traffic Impact Assessment Report provided in *Annex M*. The proposed bus stop locations are also detailed in Figure 4.1 and will be typically be located approximately 200 metres apart, ensuring key community areas such as parks and reserves are targeted for bus stops. Designated pedestrian pathways are to be provided throughout the development, linking the eastern and western residential areas. Cyclists will be accommodated within the proposed road network.

The Traffic Impact Assessment report demonstrates that the existing and proposed road is adequate to cater for the proposed development.

7.5.1 Traffic Noise Assessment

A noise assessment report was prepared by ERM in April 2005, as a part of the Fern Bay Estate Master Plan Study (see *Annex N*). This report was to assess the impacts of Nelson Bay Road traffic noise on the subdivision and development on part of Lot 16 DP 2588848, 85 Nelson Bay Road. The DECC (Environment Protection Authority) recommended that the traffic noise impacts be assessed according to the *Environmental Criteria for Road Traffic*

Noise (ECRTN) (EPA 1999), therefore the criteria set out in the policy was adopted for assessment of operational noise from Nelson Bay Road.

Noise models in the report were calculated using predicted Annual Average Daily Traffic (AADT) flows for traffic on Nelson Bay Road, based on data obtained from an RTA Pavements Branch assessment performed in February 2002. Noise levels in the report were calculated on:

- an AADT of 19 494 in 2005;
- dense graded asphalt as the road surface; and
- 100 km per hour car and truck speed.

No official AADT data has been collected for the station since 2001, so the traffic data used in the noise modelling is the most recent and relevant available. The dense graded asphalt road surface still applies to the Nelson Bay Road, and the speed limit has not been increased from the 100 km per hour used for modelling traffic noise in the report.

The modelling concluded that a 200m setback from Nelson Bay Road would be suitable for meeting required noise levels. This buffer is present in the Fern Bay Seaside Village in the form of the 200 metre ecological corridor along the road. The Fern Bay Estate Master Plan Noise Assessment Report remains current and relevant to the existing Part 3A Assessment of the Fern Bay Seaside Village, and does not require updating. The noise report is contained in *Annex N*.

7.6 INFRASTRUCTURE PROVISION

The proposed residential subdivision was supported by a Sewer and Water Servicing Strategy prepared by GHD (November 2004). A copy of this report is contained in *Annex O*. This strategy has been approved by Hunter Water Corporation and is relative to the existing and proposed subdivision. All existing and proposed residential lots within the subdivision will have access to reticulated water and sewer.

The subdivision is also supported by a number of fire hydrants that comply with AS2419.1-1994 Fire Hydrant Installation and the requirements of Hunter Water Corporation.

The relevant infrastructure plans are contained in *Annex B* plans 7 to 12.

7.6.1 Feasibility of a Greywater System

The feasibility of a greywater reticulation system was considered in the early stages of the project, when it was thought a sewage treatment plant would be

constructed on the land immediately to the east of the site, then owned by Hunter Water Corporation. It was intended that this plant would service the Fern Bay Seaside Village and the proposed adjoining subdivision to the south which at the time was to be pursued by Landcom. This would have resulted in a scale of operations that would economically justify the implementation of a greywater reticulation system within the Fern Bay Seaside Village. The plans for the surrounding land changed, with both the land immediately to the east and south of Fern Bay Seaside Village being part of the Worimi Conservation Lands managed by DECC. With the reduction in scale of the total subdivision and the fact that the adjacent sewage treatment plant has been abandoned, the Fern Bay Seaside Village site is to be serviced by Hunter Water Corporation.

The scale of the Fern Bay Seaside Village and the absence of a nearby sewage treatment plant have resulted in a greywater system no longer being economically feasible for the site. The existing stages of the Fern Bay Seaside Village are supported by a Hunter Water Corporation sewerage system. Over 100 lots have been developed in the Village to date, and the cost of retrofitting these lots with a greywater reticulation system are too costly to justify.

Given that the Fern Bay Seaside Village is a new subdivision, the dwellings will be subjected to the requirements of the BASIX scheme, as introduced by the NSW Government. This scheme ensures homes are built to be more energy and water efficient, and compliance with targets must be met before a BASIX certificate is issued. Every development application for a new home must be submitted to Council with a BASIX Certificate, therefore homes within Fern Bay Seaside Village will have both energy and water efficient aspects incorporated into their designs and fit-outs.

The feasibility of implementing a greywater reticulation system in Fern Bay Seaside Village was considered in the early stages of the project. It has not been incorporated into the final plans, however, due to such a system being economically unviable for a development of this scale. Despite this, water consumption within the development will be considerably lowered, due to the likely inclusion of new and modern appliances in homes, and the requirement for dwelling compliance with the NSW Government BASIX certificate.

7.7 ECOLOGICAL CONSIDERATIONS

The Fern Bay Seaside Village forms part of a local corridor of native vegetation and active dunes that extends along the coastal dune system of the Stockton Bight. The vegetated dunes typically support dry sclerophyll forest with swamp forest and/or heath associated with dunal swales. Large sections of the Stockton Bight coastal dune system are now protected within the Worimi Conservation Lands which include the Worimi Regional Park, Worimi National Park and Worimi State Conservation Area. In a regional context, the site is part of a corridor that links the Tomago coastal plain with the Lower

Hunter plain, then west to the Sugarloaf Range. While not part of the proposed Watagans Ranges to Port Stephens reserve through Hexham Swamp identified in the Draft Lower Hunter Regional Conservation Plan (DEC 2006), the site is continuous with this reserve through the regional corridor.

In preparation of the Master Plan Study for the proposed Fern Bay Seaside Village, ERM have undertaken ecological investigations on this site from 2002 to 2005. Prior to that, ecological investigations have been on the site since 1992. The field investigations and assessments for the Master Plan Study concentrated on the area external to the approved subdivision. The findings of these reports form the basis of the ecology assessment for the Project Plan approval (see *Annex P*).

The results of field investigations are provided in a number of reports including an Ecological Assessment Report (ERM 2009c), Aquatic Assessment Report (ERM 2005c), Assessment of Matters of National Environmental Significance (ERM 2005e), Response to the Port Stephens Comprehensive Koala Plan of Management (ERM 2005f) and a Species Impact Statement (SIS) (ERM 2005a).

An assessment of Koala habitat was provided in a number of the Master Plan studies in particular the response to Response to the Port Stephens Comprehensive Koala Plan of Management (ERM 2005f) and are summarised in *Annex Q Section 3.1*. Koala habitat map for the Fern Bay Seaside Village is provided in *Annex Q: Figure A.6*.

The Koala habitat assessment undertaken by ERM (2005f) identified the areas mapped as swamp forest and wet heath in the study area as *potential* Koala habitat as defined by State Environmental Planning Policy No 44 – Koala Habitat Assessment (SEPP 44) and preferred Koala habitat as defined in the CKPoM (see *Annex Q*). The Coastal Sand Apple-Blackbutt Forest is identified as supplementary Koala habitat. Although the swamp forest and wet heath support *potential* Koala habitat, the two vegetation communities do not support *core* Koala habitat as defined by SEPP 44. This conclusion is also supported by the lack of recent (post-1992) records of Koalas in the study area and the fact that Gunninah Consultants (1996 revised 1997, 2002) and ERM (2004, 2005a, 2005f) did not find any evidence of Koala usage in the study area. There have been no records of Koalas on the adjoining Boral property (ERM, 2006a).

The proposed residential subdivision (excluding the approved residential subdivision over part of the site) as defined in the approved Master Plan and adopted in the current Project Plan assessment will result in the disturbance and removal of approximately 70 hectares of existing vegetation. Approximately 107 hectares of existing vegetation (52% of the site) is proposed to be retained of which approximately 2.4 hectares (of Coastal Sand Apple Blackbutt Forest) will be cleared for construction of infiltration basins and these areas will be rehabilitated. *Figure 7.2* shows the vegetation to be

retained on site (in managed bushland reserves including wildlife corridors) and the areas of vegetation to be removed (in the development footprint).

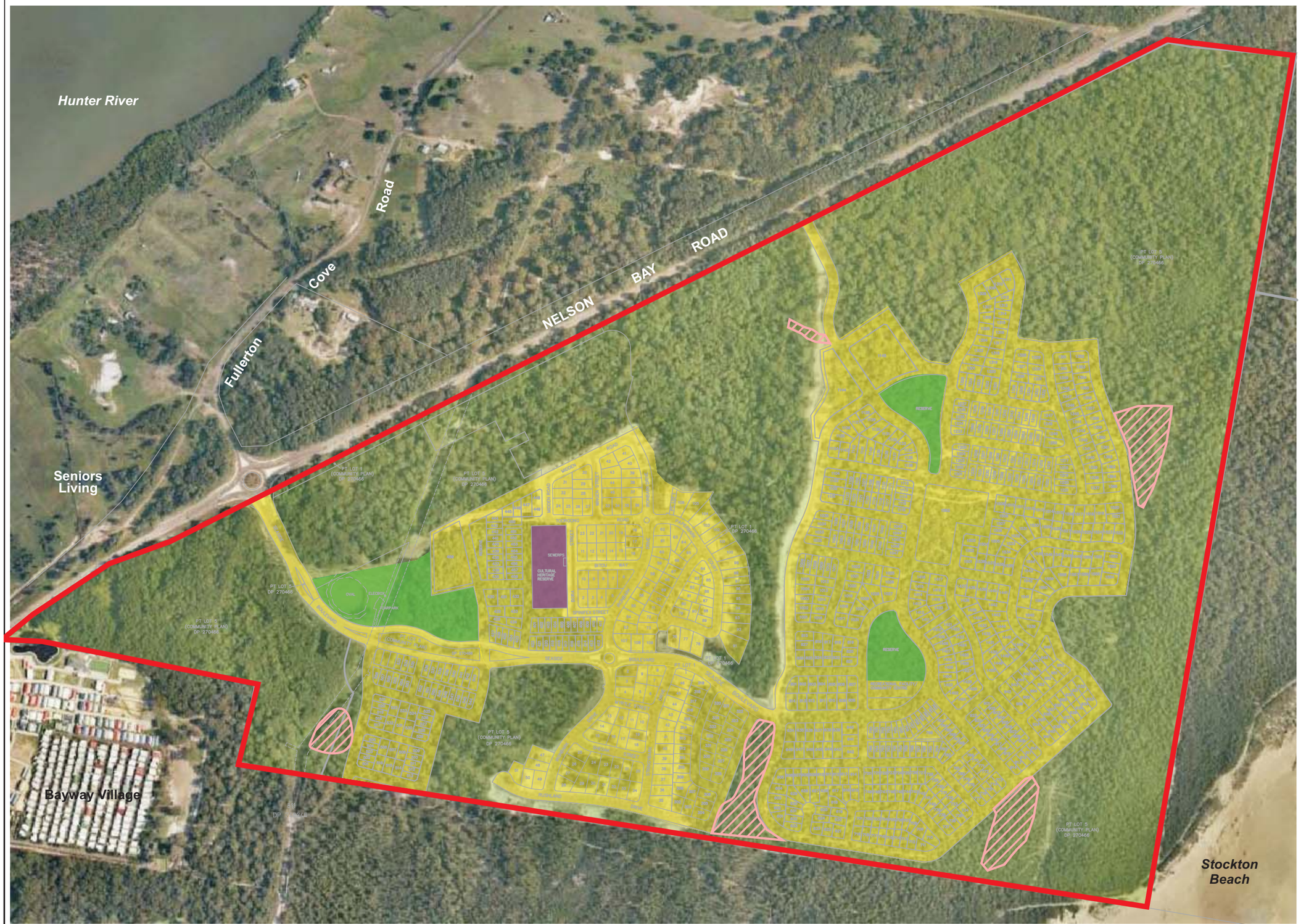
The most significant impact identified in the SIS (see *Annex R*) will be the loss of habitat and habitat resources such as hollow-bearing trees and winter-flowering trees (ERM 2005a). However, the proposed design strategically conserves habitat for affected species and communities within ecological corridors and in areas that will maintain connectivity to surrounding land. Management of native vegetation on site will involve the rehabilitation of disturbed areas and management of the bushfire regime in order to increase floristic diversity in the area (ERM 2005a).

The impact of the proposed subdivision on groundwater dependent ecosystems is considered in *Annex R* and *Section 7.9*. The Water Sensitive Urban Design (WSUD) proposed for the subdivision aims to provide for increased infiltration of surface flows and treatment of runoff to reduce pollutants (such as total nitrogen, total phosphorus and total suspended solids) in bio-retention swales within road reserves throughout the development footprint, gross pollutant traps and infiltration basins (see *Section 7.9*). The subdivision drainage system does not rely on piping of stormwater and diversion to more permanent water storage areas with the emphasis being on infiltration of water and nutrients within the development footprint. It is noted however that during peak flows, water levels in two areas of the swamp forest may be increased as a result of surface flows. However these events are expected to be associated with a 1 to 100 year rainfall event.

The Fern Bay Estate Species Impact Statement identifies 37 threatened species and one endangered ecological community as likely to be impacted by the development (2005a). Of these threatened species and ecological communities, seven fauna species are considered most likely to be impacted by the proposal given that local populations are present and depend on habitats located in the development areas for long term viability. These species are: Masked Owl, Powerful Owl, Hoary Wattled Bat, Eastern Freetail-bat, Yellow-bellied Sheathtail-bat, Greater Broad-nosed Bat and Squirrel Glider.

The SIS concluded that the retention of approximately 54% of the estimated number of habitat trees and retention of movement corridors in the study area will ensure the long-term viability of the Squirrel Glider population, which is a flagship species for the conservation of threatened species in the study area and wider locality. The conclusion assumes that no development (with the exception of the access roads) will occur within the ecological corridor (see *Annex R*).

An assessment of the impact of the proposal on Matters of National Environmental Significance is provided in *Annex H*. This assessed the impact on the following threatened species: *Diuris praecox*, *Rulingia prostrata*, *Eucalyptus parramattensis* subps *decadens*, Swift Parrot, Regent Honeyeater,



Legend

- Fern Bay Seaside Village
- Vegetation to be Retained
- Vegetation to be Removed
- Managed Vegetation
- Cultural Heritage Reserve
- Vegetation to be Modified

Figure 7.2

Vegetation Management Areas

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_Planning_19		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	-		
Scale:	Refer to Scale Bar		

N

0 100 200 300m

Environmental Resources Management Australia Pty Ltd
53 Bonville Avenue, Thornton, NSW 2322
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ERM

Large-eared Pied Bat, Spotted-tailed Quoll and Grey-headed Flying-fox (see *Section 4.5.1* of ERM 2005e). It also considered the impact on migratory species including the Swift Parrot, Regent Honeyeater, White-throated Needletail, Black-faced Monarch, Satin Flycatcher and White-bellied Sea-eagle (see *Section 4.5.2* of *Annex H*). The report concluded that a local population of threatened species or migratory birds would not be significantly impacted by the proposed development and that no further assessment under the EPBC Act is warranted.

Further investigations identified approximately 20 clumps of the hybrid *E. parramattensis* subsp *decadens* species and an estimated population size of approximately 74 trees were identified in the immediate locality (ERM 2009c). Additional investigations during 2008 identified this species as *E.parramattensis* subsp *decadens* x *E. robusta*. While not listed as vulnerable, the hybrid is considered to have high conservation significance (ERM, 2009f) Of approximately 74 trees identified, only seven trees occur within the Fern Bay Seaside Village development area, with the remainder occurring within the Worimi Regional Park. The individuals located within the Fern Bay Seaside Village will be removed by the proposed development. The majority of the population will not be impacted directly by the project.

Management of the hybrid *E.parramattensis* subsp *decadens* x *E. robusta* individuals in the Worimi Regional Park is outlined in the Vegetation Management Plan for Worimi Regional Park (*Annex D*).

A number of measures have been incorporated into the design of the residential subdivision footprint to either avoid or mitigate ecological impacts and species specific impacts including:

- restriction of development to the residential 2(a) zone;

- retaining a minimum 200 metre ecological corridor along the northern boundary of the site. This area will provide a movement corridor for fauna through swamp forest and will prevent threatened species becoming isolated from the currently interconnecting areas of the habitat to the south and to the north. Approval for this corridor will override the existing development consent for residential development thereby enabling retention for biodiversity values;

- protection of large areas of preferred Koala habitat and habitat buffers within the wildlife corridor. This not only minimises impact on Koala habitat but will also minimise impact through providing a buffering to the swamp forest habitat;

- retaining an ecological corridor along the eastern boundary of the site to provide a movement corridor for fauna through dry sclerophyll open forest and swamp sclerophyll forest;

- establishment of a 100 metre buffer around the known Powerful Owl roost tree and in which no clearing or disturbance will be permitted;

- design and planting in bioswales in perimeter road reserves adjoining the swamp forest and wet heath to trap runoff and provide a buffer to the neighbouring vegetation; and

- majority of retained vegetation is zoned or will be zoned 7(a) Environment Protection and 1(a) Rural Agriculture.

Various management initiatives are also proposed to minimise impacts on fauna and flora within Fern Bay Seaside Village. Management of vegetation and fauna within the environmental protection zoned land and reserves will be in keeping with the Community Lands Environmental Management Plan (ERM 2009b) that accompanies this Project Plan application. Management initatives include, amongst others:

- community title subdivision to ensure that a high standard of amenity and environmental protection is maintained. Community title also provides a forum for overseeing management of retained vegetation within reserves and the wildlife corridor, and education of residents to reduce indirect impacts through control of pets, discouraging rubbish and garden refuge dumping;

- implementation of measures to reduce weeds in the retained vegetation as identified in the Community Lands Environmental Management Plan for the Fern Bay Seaside Village (2009b);

- management of risk of bush fire spread to retained vegetation through provision of defendable space in asset protection zones and perimeter roads. The perimeter roads may also reduce incidence of rubbish dumping over back fences as the interface with retained vegetation is a public space managed under Community Title; and

- pre-clearance inspections and implementation of tree clearing procedure for hollow-bearing trees whereby individuals are encouraged to abandon habitat trees through clearing of all non-habitat trees around the hollow-bearing tree first, then no clearing for a period of time before felling the hollow-bearing tree. A suitably qualified wildlife professional will be on site during felling of the hollow-bearing tree. Any individuals recovered during tree felling will be released into adjoining habitat on site. These procedures are discussed in more detail in the Community Lands Environmental Management Plan (ERM 2009b) which forms part of this Project Plan application (*Annex V*).

It should be noted that the SIS did not support development of a formal translocation proposal for individuals or a colony of the Squirrel Glider. Tree clearing procedures outlined above aim to provide the opportunity for individuals to abandon habitat trees prior to clearing to reduce the risk of

injury or death of individuals. Prior to clearance of each stage, indirect impacts associated with edge effects of the development, in particular noise, may result in the abandonment of nest sites close to the development footprint.

With reduction in available habitat over the life of the development (up to 10 years) there may be loss of displaced individuals through competition for remaining hollows. Connectivity between retained vegetation on site and adjoining areas will provide for dispersal of individuals.

As identified in the Community Lands Environmental Management Plan microhabitat features such as hollow logs and branches may be removed from the development area and placed within reserves and open space on site. The need for this measure will be reviewed at each stage of the development with consideration given to the habitat features available in adjoining areas

As part of the Master Plan approval an agreement was reached that the loss of habitat trees and the wet heath would be compensated through preparation and support of a Vegetation Management Plan (VMP) for the Worimi Regional Park land (previously Ministerial Part 11 land) to the south of the subdivision for a period of 20 years. The Vegetation Management Plan will be implemented through a Voluntary Planning Agreement between Aspen and the Department of Environment and Climate Change. A copy of the VMP prepared by ERM (2009f) is provided in *Annex D*. A copy of the draft Voluntary Planning Agreement is provided in *Annex W*.

The VMP outlines measures to improve the condition of wet heath and overall management of the land by removing identified waste and weed occurrences and regenerating or restricting access to certain tracks. It also discussed proposal for the formalisation of a four-wheel drive access to Stockton Beach. Through weed management, waste removal and closure of tracks the adverse impacts on the habitat value of the areas of wet heath and dry sclerophyll forest in the Worimi Regional Park will be reduced. Extension of the preliminary principles of bush fire management and pest management identified in the VMP through implementation of the broader plans currently being developed by DECC for the Worimi Conservation Lands will further enhance habitat values through management of bush fire frequency and pest species management.

Management of the hybrid individuals of *Eucalyptus parramattensis* subsp *decadens* in the Worimi Regional Park is also outlined in the Vegetation Management Plan for Worimi Regional Park (ERM 2009f). This includes further taxonomic investigations of the hybrid, protection of individuals from indirect impacts associated with weed management and the construction of the formalised four-wheel drive track.

7.8 IMPACTS ON ADJOINING LANDS

The existing landscape character is a fundamental factor in determining the visual impact of a proposal and the impacts to adjoining lands. The development footprint incorporates design controls to ensure that the visual amenity of the surrounding area is maintained and enhanced.

The 200 metre vegetated bushland strip between the subdivision and Nelson Bay Road ensures that the impact on the only area where the site is visible to the public remains in a natural state. No dwellings will be visible from Nelson Bay Road.

To the south is the Worimi Regional Park with the boundary being the four-wheel drive track and access to the beach. This four-wheel drive track, when constructed, will be the legal access point into the Worimi Regional Park and public access to the beach. There will be part of the subdivision visible from the track however this is not considered a critical viewpoint and being visible will enhance safety aspects.

To the east is also the regional park and Worimi State Conservation Area. A 200 metre vegetated and, in part, elevated buffer will ensure that the subdivision is essentially screened from the park.

There is potential for increased illegal access into the Worimi Conservation Lands. The recommendations of the Vegetation Management Plan for the Worimi Regional Park will assist in managing the potential increases in illegal activities by the following:

- construction of an approved four-wheel drive track (not part of this current application), providing the only legal access route through the regional park to the beach. Associated car parking, pedestrian footpath, lighting and signage will also provide a controlled access route;

- erection of a boundary fence on the shared boundary of the Fern Bay Seaside Village to the south and the northern boundary of the Worimi Regional Park to delineate the boundary and prevent illegal access at other points. The location of the proposed fence is detailed in *Figure 7.1*;

- closure and long term rehabilitation of existing numerous tracks throughout the regional park, thereby limiting access throughout the park and improving the condition of the regional park; and

- removal of existing rubbish dumps will increase the amenity of the park and aid in the deterrence of future polluters.

Figure 2.2 identifies the pedestrian pathways to be constructed throughout the Fern Bay Seaside Village. The pedestrian pathway network will provide walking opportunities fully contained within the Fern Bay Seaside Village. Public access through the Worimi Regional Park will be provided at legal

access points at the discretion of the Board of Management of the Worimi Regional Park.

A sand extraction operation owned by Boral Resources Pty Ltd is located to the north of the site. The land is known as Lots 1 & 2 DP 1006399 & Lot 3 DP 664552, and the current sand extraction operation has been occurring for over 10 years. In 1996, Boral commenced sand extraction from Lot 1 under development consent approved by Port Stephens Council (DA2010/94). This involved dry screening in a pit to remove vegetative roots, minor naturally occurring coal fragments and small fragments of slag chitter and recycled road base used on truck haulage roads. A front end loader loads road trucks in pit with screened raw sand for transport off site via a weighbridge. Transport from the site is via Coxs Lane to the north of the extraction area. This consent was originally for a 10 year period, however consent was extended by a further 3 years, with an expiring date of 2009. The resource at the site is largely exhausted with extraction to cease within the current consent period (ie by 2009). Boral are currently undertaking progressive rehabilitation of the site.

Boral more recently received approval from the Minister for Planning in 2006 for sand extraction on the eastern boundary of the Boral property. The approved activities include dry extraction of bare dunes and the harvesting of northward moving windblown sand along and within the Boral seaward boundary. These operations will be in excess of one kilometre from the nearest residential property within the Fern Bay Seaside Village, as evident in *Figure 3.1.* The transport of product won from the extraction operations will be via a haul road to the northwest of the operations. The haul road will be greater than one kilometre from the nearest residence within the Fern Bay Seaside Village.

The Environmental Impact Statement (ERM, 2005g) prepared to support the development application for the bare dune and windblown sand operations proposed by Boral in 2006 (and in which consent was subsequently granted), included an assessment of impacts on neighbouring properties, including the proposed Fern Bay Seaside Village. The assessment concluded:

- the Boral operation would unlikely impact the ambient air quality of the Fern Bay Seaside Village under a no control scenario. Boral will apply controls measures including dust suppression on haul roads and maintaining the existing vegetated buffer;

- the separation distances of the Boral development to the nearest residential properties at both Coxs Lane and the proposed Fern Bay Seaside Village are approximately 1km to 1.5km (distance depends on the stage of quarrying). The predicted noise impacts found that the required set back distances for residences from the extraction operations to achieve the intrusiveness criteria of 35dB(A) L_{eq} was approximately 900 metres under a worst case scenario with no noise mitigation measures in place. The

required setbacks are therefore achieved without the application of noise mitigation measures.

- Boral's operations will not be visible from the proposed Fern Bay Seaside Village site.

The sand extraction operations of Boral will therefore have no impacts on the proposed Fern Bay Seaside Village in relation to noise, dust, and visual amenity.

7.9 TRUNK DRAINAGE CONCEPTUAL PLAN AND WATER SENSITIVE URBAN DESIGN PRINCIPALS

7.9.1 Background

Urban Water Cycle Solutions was engaged by Aspen to produce an Urban Water Cycle Management Strategy based on the subject town plan. This strategy was completed in May 2007 and is provided in *Annex S* as background documentation. The Urban Water Cycle Management Strategy comprehensively encompasses all aspects of Water Sensitive Urban Design and details indicative catchment and detention requirements. This Strategy presents a conceptual framework for trunk drainage and water treatment outcomes. The Strategy was used by DMS Survey Pty Ltd as background documentation to develop the complete trunk drainage conceptual plan and Water Sensitive Urban Design for the site (refer to *Annex S*).

DMS Survey Pty Ltd have provided additional grading and level detail to the town plan, examining the town plan through detailed rational method modelling for water flows and storage requirements, tested water quality outcomes of the water treatment train utilising the Model for Urban Stormwater Improvements Conceptualisation (MUSIC) software and reviewed the practical implementation of Water Sensitive Urban Design philosophies. The sheets indicating these details are attached in *Annex B* (refer to sheets 10, 11 and 12 of 18). Through Stages 1 and 2 of the development, Water Sensitive Urban Design procedures were successfully implemented on the site and have proved desired outcomes.

The plans contained in *Annex B* include a trunk drainage and catchment plan (10 of 18) which shows detention basins and drainage swales. Conceptual plans and detailed drawings are also contained in *Annex B* (11 and 12 of 18).

7.9.2 Trunk Drainage Conceptual Plan

Fern Bay Seaside Village occupies a site of some 200 hectares and is comprised of undulating remnant sand hills, low lying areas and scattered remnant forest. The predominant soil type is a fine grained sandy soil, some organic

topsoil and swamp deposit materials and some areas of peat. The predominant sandy soils are therefore highly suitable for the implementation of WSUD Strategies over the site.

The Urban Water Cycle Management Strategy 2007 (see *Annex S*) produced by Urban Water Cycle Solutions has been extensively consulted throughout the production of the Trunk Drainage Conceptual Plan and the detail contained in that plan is based on the Management Strategy. Detailed plans of the trunk drainage are contained in *Annex B*.

Three areas are proposed to create the remainder of the village, Area 1 some 60 allotments in the southwest, Area 2 some 60 allotments and integrated housing sites in the northwest and Area 3 the remainder of the site containing in excess of 600 allotments and integrated housing sites in the eastern part of the subdivision.

Area 1 has flows predominantly from east to west, levels ranging from 4.7m Australian Height Datum (AHD) to 2.5m AHD and drainage terminating in a detention basin, Detention Basin 1. The detention basin will be sited in both position and level to provide further stormwater treatment and contain 1 to 100 peak discharge within the detention basin and within the subject site. No impact upon adjoining areas is expected.

Area 2 has flows predominantly from east to west, levels ranging from 7.1m AHD to 2.5m AHD and drainage terminating in a detention basin, Detention Basin 2. This area is constrained by existing Stages 1 and 2 and the Cultural Heritage Reserve. Flows from the basin in the 1 to 100 storm event and peak discharge will be wholly contained within the detention basin and wholly contained within the site. No impact upon adjoining areas is expected.

Area 3, the remainder of the subdivision, can be divided by a watershed running north-south and east-west roughly segregating the area into four catchments. The apex of the watershed has levels peaking at approximately 6.3m AHD and grading to 2.5m AHD at each proposed detention basin. Stormwater will flow from the watershed, be treated using WSUD principles and conveyed to each detention basin. At each detention basin, the 1 to 100 year storm event peak flows will be wholly contained within the detention basin and wholly contained within the subject site. No impact upon adjoining areas is expected.

For each of the urban areas and individual catchments, water will be treated, conveyed and stored wholly within the subject site and treated accordingly to Water Sensitive Urban Design principles. Due to the sizing of the detention basins and the full containment of the 1 to 100 year rainfall event, no impact on adjoining areas is expected.

7.9.3 Detailed Examination of Stormwater Flows

The subject development consists of three separate and distinct areas. Areas 1 and 2 are separate and homogenous catchments and Area 3 (the larger development area) consists of four areas roughly divided by a north to south and east to west watershed. Each of these areas has been modelled in detail utilising Drains Software by Watercom Pty Ltd. This software through the rational method of stormwater modelling was used to simulate the operation of urban stormwater drainage systems. The model uses time-area calculations and Horton Infiltration procedures to calculate flow hydrographs from sub-catchments. In this particular case, calculations were performed at step intervals using some 20 storms ranging from five minutes to 72 hours. The catchments produce peak flows, nodally connected by overland flow paths (drainage swales) and eventually terminate in a detention basin as required by this site. The software therefore models peak flows and total detention requirements, less infiltration under hydraulically saturated conditions, over the major maximum flow storm event. *Annex S* contained all rational method outputs from the Drains modelling.

This data was then used to size the required detention basins in accordance with the Project Plan. Once watersheds, catchments and detention basin positions are determined, individual areas can be modelled using MUSIC software to examine the effectiveness of the Water Sensitive Urban Design treatment train.

Area 1

Catchment 1 is situated in the southwest of the site covers 2.16 ha, has peak flows of 1.498m^3/s and requires a 2500m^3 detention basin (Detention Basin 1).

Area 2

Catchment 2 is situated in the northwest of the site and covers 4.25 ha, has peak flows of 2.970m^3/s and requires a 6,600m^3 detention basin (Detention Basin 2).

Area 3

Area 3 forms the remainder of the site and consists of four distinct catchments divided by a north to south and east to west watershed

- Catchment 3 situated in the southwest of Area 3 consists of 14.71 ha, has peak flows of 5.370m^3/s and requires a 12,300m^3 detention basin, Detention Basin 3;

- Catchment 4 situated in the northwest of Area 3 consists of 13.57 ha, has peak flows of 4.990m^3/s and requires a 10,000m^3 detention basin, Detention Basin 4;

- Catchment 5 situated in the northeast of Area 3 consists of 9.20 ha, has peak flows of 4.139m^3/s and requires a 7,800m^3 detention basin, Detention Basin 5; and

- Catchment 6 situated in the southeast of Area 3 consists of 7.89 ha, has peak flows of 3.950m^3/s and requires a 6,200m^3 detention basin, Detention Basin 6.

The resultant detention basin requirements are detailed in *Table 7.2.*

Table 7.2 Detention Basin Requirements

Area	Catchment	Catchment Size (ha)	Peak Flow (m^3)	Basin (m^3)
1	1	2.16	1.798	2,500
2	2	4.25	2.970	6,600
3	3	14.71	5.370	12,300
3	4	13.57	4.990	10,000
3	5	9.20	4.139	7,800
3	6	7.89	3.950	6,900

7.9.4 Urban Water Cycle Solutions Watercycle Management Strategy

Urban Water Cycle Solutions was commissioned by Aspen to develop an Urban Water Cycle Management Strategy, for the proposed urban village at Fern Bay. The strategy comprehensively incorporates Water Sensitive Urban Design features and philosophy and produces a strategy for the implementation of these philosophies. The Strategy is contained in *Annex S* with an Addendum Report.

The report contains a conceptual framework of modelling, data and stormwater management protocols, information from previous studies and "proposes an urban water cycle management that is consistent with the natural water cycle process currently operating at the site".

The report is a comprehensive document and will not be further commented upon in detail in this supplement.

7.9.5 Water Sensitive Urban Design – A Treatment Philosophy in Brief

Water Sensitive Urban Design essentially involves the onsite treatment of rainwater and therefore urban runoff by utilising a 'treatment train' process. The process purifies the runoff through treatment well upstream in the catchment, conveys the runoff to mass storage devices and then slow infiltration into the aquifer.

Rainwater naturally contains total nitrogen, total phosphorus and total suspended solids. These contaminants by using WSUD devices can be greatly reduced. An analysis using the MUSIC program can indicate target percentage reductions of these quantities. Reductions may typically range in

total nitrogen of 55%, total phosphorus 60% and total suspended solids of 65%. Additional removal of debris and rubbish using gross pollutant traps and planted conveyance swales will remove sand and suspended silt and contaminants such oils and paints etc.

The 'treatment train' begins with rainwater falling on road and hardstand surfaces and flowing to a bio-retention swale. Rainwater falling onto roof and driveway areas is captured initially in rainwater tanks and overflows are conveyed to interallotment drainage pipes which terminate into a surcharge pit. Upwelling from these pits delivers water to the top of the bio-retention trench. At that stage the planted swale above the bio retention trench captures sand and gravel sediments and debris and rubbish collects at the downstream surface inlet pit. As water traverses the bio-retention trench it filters through a sandy treatment medium and into a socked agricultural pipe for conveyance to the larger reinforced concrete drainage pipe system. The sandy treatment medium has designed particle sizes to filter contaminants and trap these contaminants. The treated water then is conveyed to the detention basin in a conventional piped system.

The 'treatment train' is designed for first flush 1 to 3 month flows to be treated by the bio-retention swales, the pipe system designed to carry the 1 to 5 year rainfall flows and the swales designed to carry the 1 to 100 year rainfall event.

Detention and treatment basins at the termination of the catchment utilising similar principles further treat the larger flows. Once treated the water flows to natural low lying areas around the site for storage and eventual infiltration into the aquifer. Using these techniques the total addition of water to the aquifer is not increased in any respect, flows are totally contained within the site and water that flows to the aquifer has been treated within the parameters of WSUD philosophies.

7.9.6 Water Sensitive Urban Design Outcomes as Modelled using the MUSIC Software

Using MUSIC software (model for urban stormwater improvement conceptualisations), the Project Plan was conceptually evaluated to ensure an appropriate stormwater management system. By simulating the performance of stormwater quality improvement measures, MUSIC can determine is proposed systems can meet specified water quality objectives. MUSIC is designed to simulate stormwater systems in urban catchment and to operate at a range of temporal and spatial scales suitable for catchment areas up to 100km^2. Modelling time steps can range from six minutes to 24 hours to match the range of spatial scale.

Pollutant loads contain gross pollutants, total suspended solids (TSS), total phosphorus (TP) and total nitrogen (TN). As a result of the implementation of an effective treatment train of utilising Water Sensitive Urban Design principles, removal rates of TSS, TP and TN could be expected to be as high as

90%, 65% and 15% respectively. Outcomes higher than these target ranges can decrease the effect on groundwater and groundwater contamination.

Throughout the modelling of both the rational method and the MUSIC water quality conceptualization, saturated hydraulic conductivities of no more than 200mm/hour to less than 50mm/hr have been used. This range of hydraulic condition is therefore consistent with Australian Standards, Horton infiltration equations and consistent best practice.

Individual Catchment Outcomes utilising MUSIC Software

Individual nodal inputs have been modelled for each catchment and overall reductions of TSS, TP and TN are detailed in *Table 7.3*. As can be seen in *Table 7.3*, individual water sensitive urban design treatment train elements have been added to the model and resultant outcomes of percentage reductions have been achieved. *Annex S* contains the detailed data inputted into MUSIC and results from the MUSIC modelling. Graphs provided in *Annex S* indicate the effectiveness of the treatment train in removing target pollutants.

Table 7.3 Pollutant Outcomes from MUSIC Modelling

Catchment	WSUD Device	Reductions (%)			
		TSS	TP	TN	Gross Pollutant
1	Bio-retention Swale 1A	80.7	65.1	38.3	100
1	Detention Area 1	90.9	76.0	57.0	100
1	Wetland Area 1	97.2	87.2	65.6	100
2	Bio-retention Swale 2A	80.0	62.6	38.0	100
2	Detention Area 2	90.7	76.1	59.5	100
2	Wetland Area 2	91.9	78.1	60.1	100
3	Bio-retention Swale 3A	88.3	71.7	43.7	100
3	Bio-retention Swale 3B	80.0	62.5	38.0	100
3	Bio-retention Swale 3C	78.6	64.5	38.4	100
3	Basin 3	90.6	74.6	54.4	100
3	Wetlands 3	91.4	76.0	54.8	100
4	Swale 4A	77.3	54.9	30.0	100
4	Bio-retention Swale 4A	79.9	62.9	37.6	100
4	Swale 4B	80.6	57.5	32.4	100
4	Bio-retention Swale 4B	79.8	62.1	37.3	100
4	Detention Area 4	92.8	78.3	60.4	100
4	Wetland Area 4	93.4	79.4	60.6	100
5	Bio-retention Swale 5A	76.7	61.9	39.9	100
5	Detention Basin 5	88.9	73.2	52.9	100
5	Wetland Area 5	90.1	75.0	53.5	100
6	Bio-retention Swale 6A	78.1	60.2	36.8	100
6	Detention Basin 6	90.5	74.6	53.8	100
6	Wetland Area 6	91.6	76.5	54.4	100

Source: DMS Survey 2008 (see *Annex S*)

7.9.7 Examples of Water Sensitive Urban Design

Examples of some WSUD Devices utilized in providing a treatment train for urban catchments are provided in *Annex B* (refer to Plans 11 and 12 of 18). These have been organized into initial devices for connecting into individual allotments, through to detention basins at the end of the treatment train.

The Bio-retention Trench House drains detail and house drainage pit detail, indicates how water is supplied to the individual drainage pit from each allotment, filtered for rubbish and debris and then treated by flowing out of the agricultural pipe to the sandy filter. The water then flows to surrounding soils as it passes along the trench to the next node.

The James Hardie slotted fibre reinforced concrete sump pit indicates the detail for a pit that upwells water into the bio-retention trench.

The bio-retention swale and trench indicates the sandy layer and agricultural pipe for conveyance and infiltration.

The bio-retention surface inlet pit indicates typical detail of how water enters the bio-retention treatment and conveyance systems.

The bio-retention infiltration trench indicates storage and infiltration devices located at terminal points of some treatment reaches.

The infiltration basin indicates a typical arrangement of the conveyance swales, bio-retention trenches, pipes and detention/infiltration basins.

Other drawings indicate piped and structural detail of other devices.

7.9.8 Trunk Drainage and Water Sensitive Urban Design Conclusion

Utilising Water Sensitive Urban Design through a treatment train philosophy has the capacity to treat and purify rainwater and urban residential contaminants to very high standards suitable for further input into the aquifer.

The implementation of this philosophy by constructing WSUD devices throughout the site will achieve target reductions in these contaminants and will be wholly contained within the subject site. The net effect to groundwater quantity and groundwater quality will not in any way be modified or be detrimental through the construction of Fern Bay Seaside Village.

7.9.9 Summary of Potential Groundwater Impact

Since 1992 various studies have been completed to gauge the potential impact upon groundwater of the proposed development. These studies firstly assessed the underlying geology, soil type and capacity to infiltrate rainwater into the aquifer and secondly monitored ground water levels and ground water movement within the site.

This section provides a summary of potential groundwater impacts identified in studies undertaken on site.

Coffey Partners International, *Fern Bay Engineering Study Stage 1 Report*

This report states:

"An assessment of the topography and natural drainage within the study area has previously been reported by Coffey Partners International, 1992. It was noted that the topography across the site comprises a series of gentle to steep undulating relict sand dunes enclosed terminally draining interdunal basins. Relief across the site ranges from RL 1m to 28m.

A belt of mobile dunes extends about 500m to 600m inland from Stockton Bight and covers approximately 85 hectares of the eastern part of the site. Localised slopes up to 65% (angle of repose) occur along the western margin of the mobile hind dunes.

Dune structures across the site are generally orientated parallel to the shoreline (northeast to southwest). Two main lines of dunal ridges and hills occur across the site in the above alignment. A series of individual sand hills/knolls occur across the eastern corner of the site. Elevation decreases across the southern part of the site which comprises a series of broad, low, undulating dunes generally less than RL 10m in elevation.

Surface slopes in excess of 25% generally occur on the two main dunal ridges and on the sand knolls situated across the eastern part of the site. Localised surface slopes up to 40% occur in these areas. Gradient changes in are generally abrupt with steep slopes in excess of 25% often extending from ridge crest to flat interdunal areas.

Table 7.4 provides summary of groundwater levels measured across the site throughout 1992. It appears from the results of groundwater modelling received to date that there is substantial capacity for infiltration in the study area. Preliminary estimates based on the groundwater response to 100mm of rainfall in early February suggest infiltration rates approaching 90% to 95%. A preliminary estimate of average infiltration of rainwater into the dune system on the long term groundwater level, assuming a transmissivity of 600m^2 per day, is calculated at around 75%. Based on experience in the region, it is considered that the transmissivity of the subsoils at the site is likely to be higher than 600m^2 per day. An increase in transmissivity will result in a higher assessment of infiltration rates which may approach the infiltration rate indicated by the infiltration of the February rainfall.

Table 7.4 Summary of Groundwater Levels (after Coffey Partners International, 1992)

Groundwater Levels					
BH No.	**Approx RL (m)**	**Low (m AHD)**	**High (m AHD)**	**Range (m)**	**Minimum depth to Groundwater (m)**
3	3.6	1.6	2.0	1.4	1.65
7	1.7	0.8	1.2	0.4	0.54
8	2.7	1.7	2.0	0.3	0.75
9	3.3	1.5	1.7	0.1	1.65
10	3.1	1.6	1.9	0.3	1.18
11	3.3	1.4	1.9	0.4	1.53
12	2.7	1.5	1.8	0.3	0.92
13	1.5	1.0	1.3	0.3	0.20
14	1.7	1.2	1.5	0.3	0.17
15	1.7	1.2	1.6	0.4	0.13
16	2.3	1.4			
17	2.4	1.7	2.0	0.3	0.40
18	2.3	1.4	2.0	0.6	0.27
19	2.6	1.6	1.9	0.3	0.70
20	5.8	1.8	2.1	0.3	3.73
21	4.8	1.6	1.8	0.3	2.98
22	1.9	1.0	1.4	0.4	0.40
M 3A	1.65	1.7	1.9	0.3	2.10
M A5	1.7	1.7	2.0	0.3	1.30
Period of monitoring: 24/01/92 to 28/12/92					

Preliminary estimates based on the groundwater response to 100mm of rainfall in early February suggest infiltration rates approaching 90% to 95%. A preliminary estimate of average infiltration of rainwater into the dune system on the long term groundwater level, assuming a transmissivity of 600m^2 per day is calculated at around 75%. Based on experience in the region, it is considered that the transmissivity of the subsoils at the site is likely to be higher than 600m^2 per day. An increase in transmissivity will result in a higher assessment of infiltration rates which may approach the infiltration rate indicated by the infiltration of the February rainfall".

This report has extensively identified topographical soil types, geomorphology etc, monitored ground water levels over a 12 month period and made comment on the transmissivity of rainfall runoff into the aquifer due to the proposed development.

Coffey Partners International (1996) *Assessment of Ground Water Quality and Acid Sulfate Soils.*

This report investigated groundwater impacts and effects of the proposed development on acid sulfate soils.

It referred to the earlier report and concluded:

"The results attached herein provide information on background water quality for groundwater contained in the unconfined sand aquifer beneath the Fern Bay site.

The results indicate groundwater within the aquifer to be generally slightly acid, of low to medium salinity and with a high organic content. pH levels vary from 4.2 to 6.8. The pH of 4.2 was encountered in CMPS4 near the western boundary. Experience indicates the low pH of the groundwater to be typical of waters in the area and reflects the accumulation of organic acids in the sediment sequence.

The groundwater at the Fern Bay site does not meet the criteria for use as a potable water supply in its present state, due to low pH, high organic carbon and high phosphorous concentrations.

On the basis of these results, it is considered generally suitable for irrigation provided the irrigation rates, irrigation methods and crop selection take into account the salinity levels which vary across the site. The highest salinity was encountered in CMPS2, an off site bore located on the western side of Nelson Bay Road. All onsite samples are considered suitable for irrigation".

Douglas Partners Pty Ltd (1998) *Borehole Investigations*

Conducted borehole investigations into soil types and completed soil analysis. Their report confirmed soil types, soil structure and ground water levels at each borehole location. Average water levels in the low lying areas of the borehole locations averaged 0.18m AHD.

RCA Australia (2006) *Borehole Investigations*

Conducted borehole investigations along the entry road and Nelson Bay Road for the construction of waste water pump stations, rising mains and lead-in water mains to the development for Stages 1 and 2. Their report and investigation found ground water levels to be between 0.7 and 1.2m AHD.

Parsons Brinkerhoff (2006) *Subsurface Condition Investigation*

Conducted an investigation into subsurface conditions and found groundwater levels to be approximately 0.8m AHD.

Coffey Geotechnics Pty Ltd (2008) *Installation of Monitoring Bores*

This report was a Hydrological Investigation and summary of the installation of the 7 groundwater monitoring boreholes. These 7 boreholes were strategically placed around the site, the bore casing consisted of Class 18, 50mm diameter, PVC pipe machine slotted over the intake area below the water table and wrapped in filter plastic.

The boreholes will be monitored quarterly. The monitoring to date has found the groundwater level to be in the range of 1.29 to 1.69 metres.

Urban Water Cycle Solutions (2007) *Water Cycle Management for the Proposed Urban Development at Fern Bay.*

This report was commissioned by Aspen to provide a comprehensive stormwater management strategy to the proposed development. Water

Sensitive Urban Design philosophies were extensively incorporated into the strategy.

This report identified the average groundwater levels for the site based on investigations undertaken since 1992. This data is presented in *Table 7.5*.

Table 7.5 Average Groundwater Levels under Low Lying Areas (Urban Water Cycle Solutions, 2007)

Date	Report	Average Water Level (m AHD)	Annual Rain Depth (mm)
1992	Coffey Partners (1992)	1.57	1335
1995	Coffey Partners (1996)	1.0	961
1997	Douglas Partners (1998)	0.18	1210
2006	RCA (2006)	0.7 – 1.2	1138
2006	Parsons Brinkerhoff	0.8	1138
2007	Coffey Partners (2008)	1.29 – 1.69	1326

Urban Water Cycle Solutions Study and resultant strategy contains vast amounts of information from extensive computer modelling and is provided in full in *Annex S* of this Environmental Assessment Report.

The report's conclusion in regard to groundwater levels is:

"The proposed stormwater management strategy does not intercept or extract groundwater and therefore does not require a license in accordance with Part 5 of the NSW Water Act 1912. A comprehensive WSUD strategy for stormwater management is proposed that will protect groundwater resources. The fundamental driver for the WSUD strategy is to maintain natural groundwater regimes and quality. Nevertheless, it is agreed that a stormwater management strategy in a location with an underlying aquifer should aim to maintain the natural water balance across the site and the quality of water in that aquifer. The carefully designed WSUD strategy that encourages local treatment and infiltration of stormwater will maintain the spatially varied natural water balance and the long term water quality in the aquifer".

In regard to water quality the report concluded:

"Importantly, the described WSUD system will not impact adversely on the quality of water in the aquifer. This conclusion can be drawn from the discussion in this report, the Australian Runoff Quality guidelines and a range of publications. Also note that the sand layer at the site will produce significant additional cleansing of stormwater prior to entry to the groundwater system.

Water quality concerns can be minimised by limiting the discharge of stormwater runoff from the site and managing urban stormwater runoff close to the sources of runoff. This objective will minimise disturbance of the coastal wetlands, reduce the transport of contaminants from the site and avoid

disturbance of the acid sulfate soil area. The use of water sensitive urban design (WSUD) approaches that utilise the natural characteristics of the site will deliver this objective.

Infiltration of stormwater runoff throughout the urban catchment will minimise stormwater runoff from the site. Many previous reports recommend this approach (including CMP&F, 1996; and Port Stephens Council, 1997). The use of sediment traps, bio-retention facilities and gross pollutant traps (GPT) prior to discharge of stormwater into infiltration facilities will protect the water quality in the aquifer. Excellent guidance for the management of urban stormwater quality is provided by the Australian Runoff Quality document".

In regard to water quality management during construction phases of the project, the subject site will be managed in accordance with "*Managing Urban Stormwater, Soils and Construction*" 1998 produced by NSW Department of Housing (Blue Book).

This document has become an industry standard and details in clarity the requirements by State Government in this regard. All erosion and sediment control devices will be installed during construction in the usual manner and in accordance with industry practice.

Geotechnical Assessment

Through the usual process of urban development, Council require at the end of every Stage Release, a geotechnical assessment and site classification. This site classification is to be prepared in accordance with Australian Standard (AS) 2870-1996, Residential Slabs and Footings–Construction. AS 2870 details the standards for classifying an allotment according to soil types and conditions and offers comprehensive standards for the construction of footings and slabs within those classifications.

Stage 1 and Stage 2 of the development, consisting of some 150 allotments, have through the usual development process been investigated and studied by Coffey Geotechnics Pty Ltd. Coffey Geotechnics Pty Ltd have issued site classifications for these allotments in 2005 and 2006.

These allotments adjacent to the proposed development have been classified as non reactive Class A as defined by AS 2870-1996. Footings are to be founded in natural sandy soils or on controlled fill beneath all topsoil, engineered fill and uncontrolled fill and disturbed material associated with former subsurface structures.

The additional allotments to be created under this proposal, based upon extensive geotechnical investigation of the site, will have similar soil types and structures as those allotments completed under Stages 1 and 2. It is therefore assumed that these allotments will be classified as non reactive Class A as defined by AS 2870-1996.

Groundwater Assessment Standards

The NSW State Groundwater Policy framework prepared by Department of Land and Water Conservation has been considered in the preparation of the Urban Water Cycle Management Strategy, by Urban Water Cycle Solutions.

The component policy of the framework "The NSW Groundwater Quality Protection Policy" states the policy objectives, describes the water cycle, addresses ground water quality and details strategies to achieve outcome of the policy.

The comprehensive Water Cycle Management Strategy prepared by Urban Water Cycle Solutions, creates a strategy that achieves these water quality outcomes. The strategy proposes that groundwater will not be extracted or modified at the site, or have any effect to surrounding sites or areas and as such additional assessment is not required in relation to these policies.

Annex J contains a report into groundwater impact which recommends that groundwater monitoring be carried out and concludes that with the application of WSUD there should be no significant impact on the groundwater beneath the site. *Annex S* contains the Urban Water Cycle Solution Study and an addendum report.

7.9.10 Flooding and Inundation

The Lower Hunter River Flood Study (Lawson and Treloar 1994) reports that the 100 year average recurrence interval (ARI) flood level adjacent to the site is 2m AHD. The flood study used the MIKE 11 model reported the 100 year ARI flood levels in the Lower Hunter River as follows:

- 1.77m AHD at the Longbight 2.6 cross-section which is closest to Fullerton Cove Road and Nelson Bay Road; and
- 1.8m AHD at the Longbight 2.1 cross-section further north (Lawson and Treloar 1994).

These cross-sections are contained in *Figure 7.3*.

Nelson Bay Road along the boundary of the site has road surface heights ranging from 2.4m AHD to greater than 3.8m AHD. This serves as a barrier to stormwater discharging from the site and excludes flood waters from entering the site from the estuary of the Hunter River. This road is underlain with six small pipes and culverts that allow a limited exchange of water between low lying areas on either side of Nelson Bay Road once the water levels exceeds 1m AHD. Similarly, Fullerton Cove Road that is situated further to the northwest also serves as a barrier to water flows to and from the area. It is noted that discharge of stormwater runoff via overland flow from the site to Fullerton Cove and the SEPP14 wetland is unlikely to occur.

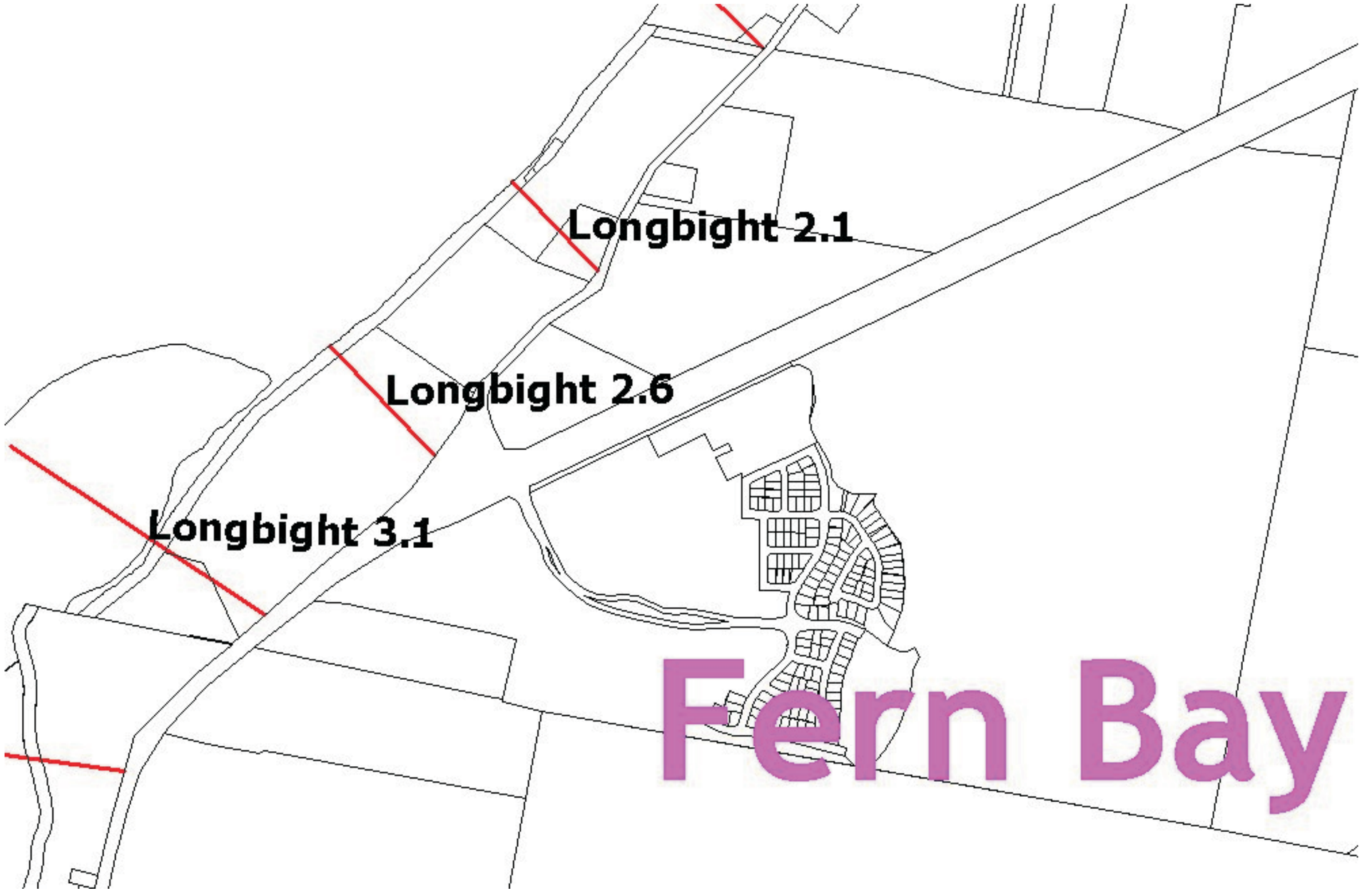


Figure 7.3
Longbight Cross Sections

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_Planning_16		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	PSC		
Scale:	Refer to Scale Bar		

N

0 100 200 300m

Environmental Resources Management Australia Pty Ltd
53 Bonville Avenue, Thornton, NSW 2322
Telephone +61 2 4964 2150

ERM

In addition, there is no recorded history of flooding at the site from the Hunter River and the topography of the land surface and surrounding road embankments make such an event unlikely. Moreover, the higher ground surrounding the low lying areas adjacent to Nelson Bay Road will also act to retain any flood waters from entering the majority of the site. It is unlikely that the majority of the site can be subjected to flooding from the Hunter River.

There is also no record of the site being subjected to local flooding. It is true that the low lying areas of the site are subject to inundation following rain events. Nevertheless, it is not proposed to build the urban development in the low lying areas adjacent to Nelson Bay Road. Thus both local and Hunter River flooding events are unlikely to impact on the development area given the proposed stormwater management solution. As such an assessment of the proposed development in accordance with the State Government's Flood Policy for Management of Flood Prone Land, NSW Floodplain Development Manual and the Port Stephens Council Flood Policy is not required beyond the assessments provided in this report.

Willing & Partners (1992) analysed the likely flooding impacts of urban development at the site. They assumed a stormwater management system that used conventional pipe drainage systems that discharged to basins located in the low lying areas adjacent to Nelson Bay Road and ultimately to Fullerton Cove. They estimated the likely 100 year ARI water levels adjacent to Nelson Bay Road were determined to be 2.04m to 2.08m AHD for a situation where the culverts under Nelson Bay Road are free draining and 2.19m to 2.3m AHD if Hunter River flood levels do not allow discharge of stormwater under Nelson Bay Road. The local stormwater runoff will be retained in the low lying areas adjacent to Nelson Bay Road.

However, it is significant that the Willing & Partners study assumed that sewage effluent would be discharged to the aquifer at a rate of 5500m^3/year, 60% of rainfall will infiltrate to the aquifer and no infiltration from the base of low lying areas. The proposed urban development will not dispose of sewage effluent to the aquifer, the actual infiltration of rainwater is expected to be 70% to 90% of rainfall and the low lying areas are expected to have some connectivity to the aquifer. In addition, it is not proposed to discharge all stormwater to the low lying areas adjacent to Nelson Bay Road via traditional stormwater drainage systems. Note that the Willing & Partners study also excluded one of the culverts passing under Nelson Bay Road. These differences will produce lesser water levels in these low lying areas. It is reasonable to assume that the 100 year ARI local flood level adjacent to Nelson Bay Road is less than 2.1m AHD. A plan showing the 100 year ARI impacts on site is contained in *Annex B* and is Plan 15 of 18.

Stormwater runoff from low frequency rainfall events (such as 100 year ARI) will be adequately contained between Nelson Bay Road that has finished levels ranging from 2.4m to 2.9m AHD and the internal dune systems. The approved Master Plan indicates that the proposed urban development is

located clear of the low lying areas adjacent to Nelson Bay Road. Planning for earthworks at the site has adopted a minimum ground level of 2.8m AHD. The WSUD strategy employs distributed management of stormwater in keeping with the natural water balance at the site and with residential floor levels set at minimum level of 3.0m AHD it is unlikely that local flooding will have detrimental impacts on the proposed development. It should also be noted that the minimum design level for roads within the subdivision is set at 2.95m AHD.

Port Stephens Council's adopted minimum floor level for habitable rooms within dwellings is 2.5m AHD. This figure was adopted following studies which identified storm surge, peak tidal events, wind/wave setup and long term rise in sea level. All finished site levels of residential parcels of land within the Village will be at a minimum of 2.8m AHD and accordingly the finished floor level of all dwellings within the Village will be at a minimum of 3.0m AHD. The flooding plan contained in *Annex B* (Plan 15 of 18) should be considered in association with the cut and fill plan also in *Annex B* (Plan 9 of 18).

In regard to the above it is confirmed that the proposed minimum floor levels will be consistent with Port Stephens Council Policy which deals minimum safe floor levels for flooding, tidal impacts and long term rise in sea levels. The effects of climate change are discussed further in *Section 7.11*.

7.10 COASTAL ZONE MANAGEMENT

The design of Fern Bay Seaside Village, and in particular the footprint of the development, is a result of a comprehensive site analysis and consideration of a number of site constraints, including coastal hazard. An assessment of coastal hazards and dune stability on the site was conducted by Australian Water and Coastal Studies (AWACS) in 1992. The AWACS report recommended that an area of 200 metres inland of the seaward face of the frontal dune be allocated to provide a buffer for coastal hazards, including beach recession, storm cut and long term climate change. The Fern Bay Dune Stabilisation Report is contained in *Annex K* and is supported by an addendum report prepared by Umwelt Pty Ltd dated November 2007.

7.11 CONSIDERATION OF CLIMATE CHANGE

The Department of Environment and Climate Change (DECC) have advised that the Floodplain Risk Management Guideline titled Practical Consideration of Climate Change (DECC 2007) should be considered for all developments where there are potential impacts. This relates to both the impact on the sea level and the increase in rainfall intensity.

The Intergovernmental Panel on Climate Change (IPCC) has recommended that for the east coast of New South Wales the sea level rise is expected to be 0.18 to 0.91 metres by between 2090 and 2100. Additionally climate change impacts on flood producing rainfall events to 2070 show a trend for larger scale storms which will potentially impact on current design ARI due to increases in rainfall.

The 2090 to 2100 (ocean) and 2070 (rainfall) have been selected as the basis for current decision making. The sensitivity analyses provided in *Table 7.6* are recommended.

Table 7.6 Sensitivity Analyses for Climate Change Decision Making

Sensitivity	Increase in Ocean Level	Increase in Peak Rainfall & Storm Volume
Low	0.18 metre	10%
Medium	0.55 metre	20%
High	0.91 metre	30%

Source: DECC 2007 Floodplain Risk Management Guideline Practical Consideration of Climate Change.

In addition to the above sensitivity analysis the policy document provides indicative changes in extreme rainfall and evaporation totals for 2030 and 2070 at various locations. The location closest and considered to be most representative of the Fern Bay site is the Hunter-Central Rivers. At this location extreme rainfall is expected to increase by 12%.

7.11.1 Floodplain Impacts

There has not been detailed modelling of the impacts caused by the above scenarios however the following assumptions have been made. The proximity of the site to the ocean means that the figures noted in Section 9.6 of the Lower Hunter River Flood Study (Lawson and Treloar 1994) should not change significantly. If the 100 year ARI figure of 1.77m AHD is considered in relation to the increased ocean levels as noted above then the following scenarios could be expected:

1. the low scenario for sea level rise considered in conjunction with the 100 year ARI flood level of 1.77m AHD would result in a combined maximum flood level of 1.95m AHD. This is below the level of 2.4m AHD minimum level of Nelson Bay Road which effectively prevents Hunter River floodwaters from entering the site;

2. the medium scenario for sea level rise considered in conjunction with the 100 ARI flood level of 1.77m AHD would result in a combined maximum flood level of 2.32m AHD. This is below the level of 2.4m AHD minimum level of Nelson Bay Road which effectively prevents Hunter River floodwaters from entering the site; and

3. the high scenario for sea level rise considered in conjunction with the 100 ARI flood level of 1.77m AHD would result in a combined maximum flood level of 2.68m AHD. In this scenario Nelson Bay Road would not prevent Hunter River floodwaters from entering the site however there would be a safety margin to the minimum finished site level of 2.8m AHD and the minimum finished floor level of 3.0m AHD.

The above demonstrates that when expected increase in sea levels are considered in association with the Hunter River flood modelling done to date there continues to be safety margin for the proposed dwellings in Fern Bay Seaside Village.

7.11.2 Rainfall Intensity

In regard to the potential impact of the increase in peak rainfall and storm volume, comprehensive detailed modelling of the above mentioned scenarios has not been undertaken.

The scenario for increase in peak rainfall and storm volumes in the Hunter Central Rivers is a 12% increase in extreme rainfall. The WSUD plan for the site relies on infiltration through drainage swales with overland flow paths to low lying sections of the site. The overland flow paths consist of drainage swales, roads, footpaths and contoured open space and bushland to direct water flows to the low parts of the site. The minimum floor level for dwellings on the site is RL 3.0 metres AHD and roads are at a minimum of RL 2.4 metres AHD. As noted above Nelson Bay Road is constructed at RL 2.4 metres AHD. In this regard there is a safety margin of in excess of 0.5 metres to the floor level of dwellings.

Should changes in rainfall intensity require reconsideration of the sizing of detention basins, there is ample area to cater for increased sizing in each of the proposed basins. The basins and infiltration areas are proposed to be located on land which will be managed by the Community Association and as such would be able to be reconsidered and funded if required in the future.

It is considered that the WSUD proposed and the naturally occurring low areas on the site will adequately cater for the predicted increase in rainfall intensity.

The above demonstrates the ability of the site and the proposed subdivision to cater for increases in peak rainfall intensity and storm volumes in each of the low, medium and high scenarios presented by the Intergovernmental Panel on Climate Change.

7.12 BUSH FIRE

Fern Bay Seaside Village is identified as bush fire prone land on the Port Stephens Council bush fire prone land map. In accordance with Section 100B(1) of the *Rural Fires Act 1997* (RF Act) an application for subdivision requires authorisation from the Commissioner of the NSW Rural Fire Service. A bushfire hazard assessment report was prepared for the Fern Bay Estate Master Plan (ERM 2005) to consider the requirements of the RF Act, Rural Fires Regulation 2002 and the then current guidelines for Planning for Bushfire Protection (NSW Rural Fire Service 2001).

This Project Plan application is consistent with the Master Plan approval. A revised bush fire hazard assessment has been prepared for the Project Plan application and is provided in *Annex L*. The Project Plan application adopts the bush fire hazard management measures as set out in the earlier assessment (ERM 2009d) and updates these to reflect the current Planning for Bush Fire Protection (NSW Rural Fire Service 2006) guidelines. It should be noted that, in accordance with Section 75U of the EP&A Act, a bush fire safety authority is not required for an approved project under Part 3A, nevertheless a bush fire hazard assessment has been prepared and the management measures will be adopted in developing Fern Bay Seaside Village.

As the proposed development is situated adjacent to remnant vegetation that exhibits a high bush fire danger, constraints will influence development that borders this vegetation. In summary, the main mitigation measures proposed to minimise bush fire threat are as follows:

- APZs will be provided and managed along all hazard boundaries (including external to the Cultural Heritage Reserve). APZ range from 20 to 25 metres and are generally provided by perimeter roads;

- vegetated areas within the APZ will be constructed and maintained through the Community Title Association in accordance with a bush fire management plan prepared in advance of each stage of construction;

- roads have been designed in accordance with the design criteria as summarised in this assessment and Planning for Bush Fire Protection to provide safe operational access for emergency services while residents are evacuated;

- Planning for Bush Fire Protection guidelines for landscaping of individual lots to minimise bush fire hazard (Appendix 5) will be distributed through the community;

- services (water, electricity and gas) will be provided in accordance with the acceptable solutions as summarised in the assessment;

- fire hydrants have been and will be provided at regular intervals in accordance with AS2419.1-1994 Fire Hydrant Installation and the requirements of the Hunter Water Corporation;

- provision of complying APZs ensures that dwellings will be constructed to a standard that complies with AS 3959; and

- the staging of the development will be contiguous thereby presenting a line of development to the hazard interface and development expanded from the perimeter of existing development.

The proposed subdivision complies with the performance criteria and acceptable solutions to increase the level of protection afforded to the subdivision in the event of a bush fire.

7.13 CULTURAL HERITAGE

The Fern Bay Seaside Village site is situated in a region rich in Aboriginal cultural heritage. Numerous archaeological sites have been recorded on the site and in the surrounding areas. These sites are of particular value to the local Aboriginal community as well as to the broader community.

In accordance with the requirements of the *National Parks and Wildlife Act 1974* (NPW Act), the site and locality has been the subject of extensive archaeological investigations. These assessments (Koettig 1987, Dean-Jones 1992, ERM 2001, 2005b) have identified the high archaeological value and sensitivity of the area and its high social value to the local Aboriginal community (McCardle Cultural Heritage 2004).

The Director-General's Requirements have requested that the cultural heritage assessment addresses and documents information contained in the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC, 2005).

The objective of these guidelines is to provide information to enable decision makers to ensure that developments have considered the following:

- information regarding the significance to those Aboriginal people with a cultural association with the land of any Aboriginal cultural heritage values on which the proposed activity is likely to have an impact;

- the views of those Aboriginal people regarding the likely impact of the proposal on their Aboriginal cultural heritage;

- any measures which could be implemented to avoid, mitigate or offset the likely impact(s); and

- any justification for any likely impact(s), including any alternatives considered for the proposal (DEC, 2005).

Figure 7.4 shows the sites identified through the Aboriginal Heritage Assessment Report at *Annex I*. These sites are discussed in the report which also considers the sites recorded over a wider area.

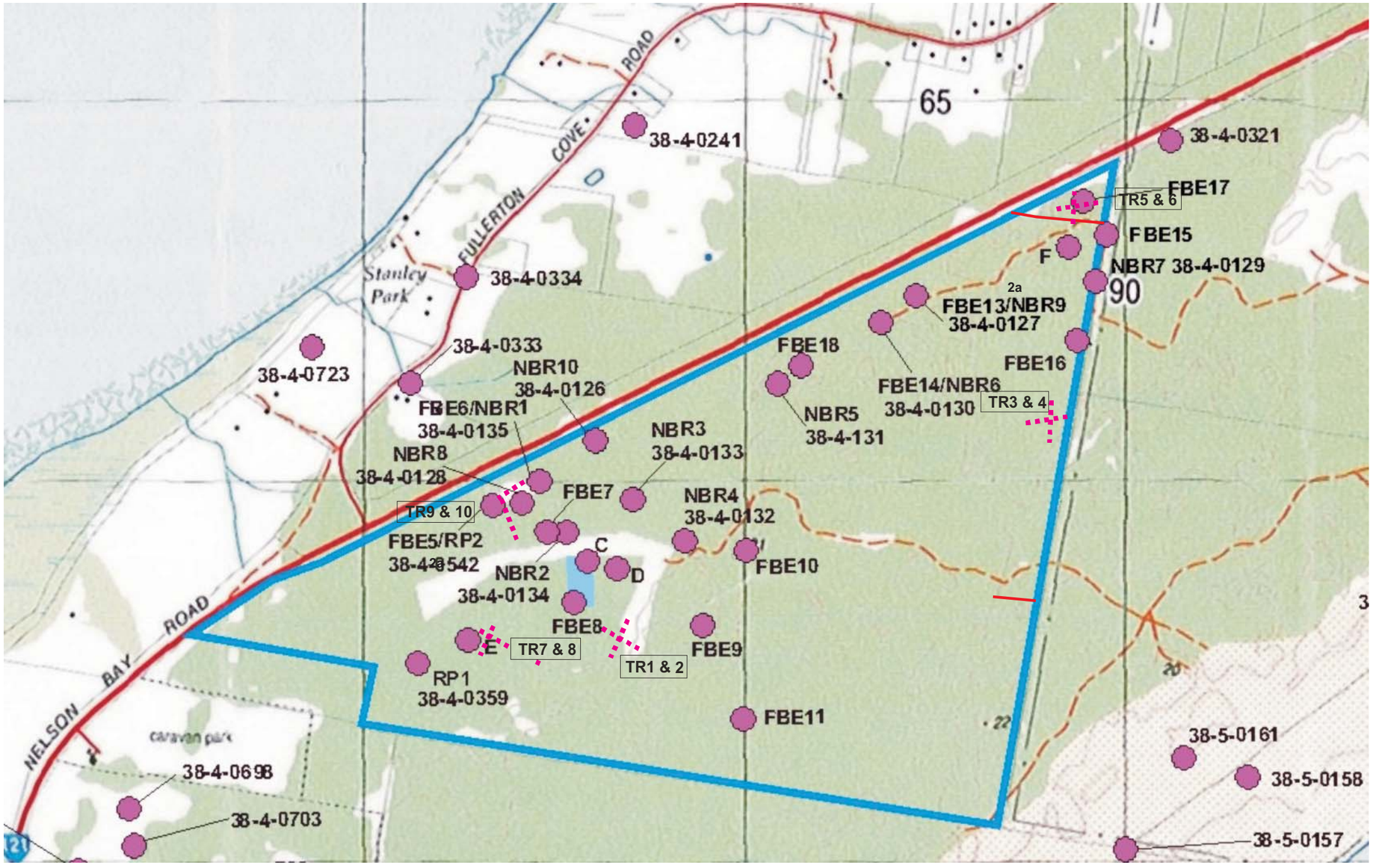
The results of previous assessments (provided in *Annex I*) and outline of the consultation process contained in *Annex I* clearly demonstrates that the assessment process to date has satisfied the above objectives and has been an integral part in determining and assessing impacts, developing options and making final recommendations.

7.13.1 Summary of Cultural Heritage Management

The consultation process satisfies the aims and objectives of the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC, 2005) and has been an integral part in determining and assessing impacts, developing options and making final recommendations.

As a result of the previous assessments and ongoing consultation, it was recommended that a Cultural Heritage Reserve should be created within the Fern Bay Seaside Village in order to retain an area that represents the key aspects of the Aboriginal archaeological record at Fern Bay. The creation of a Cultural Heritage Reserve was voluntarily adopted by Aspen. An Aboriginal Reserve Cultural Heritage Management Plan was subsequently developed for the reserve (ERM, 2009a). This Plan identifies the requirements for the protection and management of the Cultural Heritage Reserve. The Plan was developed in full consultation with WLALC (represented by Andrew Smith), MAHI (represented by Carol Ridgeway-Bissett), MI (represented by Anthony Anderson) and NI (represented by Lennie Anderson). The plan will form part of the community title agreement for the Fern Bay Seaside Village Community Association who will be responsible for the management of the reserve.

Recent consultation undertaken with the local Aboriginal community in March 2008 resulted in the community requesting a further reserve to be dedicated for aboriginal heritage purposes. Aspen Group has confirmed that they are willing to create an additional reserve within one of the two areas identified in *Figure 7.5*. The site selected for the additional Cultural Heritage Reserve will be managed generally in accordance with the Aboriginal Reserve Cultural Heritage Management Plan (ERM, 2009a).



Legend

- Fern Bay Seaside Village
- RP1 — Resource Planning (1994)
- FBE16 — Fern Bay Estate (Dean-Jones 1992)
- NBR5 — Nelson Bay Road (Koettig 1987)
- F — ERM (2000)
- Aboriginal Heritage Reserve
- 38-5-0158 — NPWS Register Number
- TR — Auger Transect Testing

Figure 7.4

Archaeological Sites Recorded on Site

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_Planning_14		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:	1:25,000 Topo Series - Williamtown Sheet		
Scale:	Refer to Scale Bar		

N

0 500m

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Legend

- Managed Reserves
- Managed Bushland Open Space
- Local Activity Centre
- Mixed Use Residential Development
- Commercial Development
- Cultural Heritage Reserve
- Part of the Approved Subdivision Area
- Potential Stormwater Management Infrastructure
- Pathway
- Fire Trail
- 10 metre Asset Protection Zone
- 20 metre Asset Protection Zone
- 25 metre Asset Protection Zone
- Additional Cultural Heritage Reserve Option 1
- Additional Cultural Heritage Reserve Option 2

Figure 7.5

Proposed Additional Cultural Heritage Reserve - Location Options

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_planning_13		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:			
Scale:	Refer to Scale Bar		

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0 50 100 150m

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ERM

7.14 ACID SULFATE SOIL AND CONTAMINATION

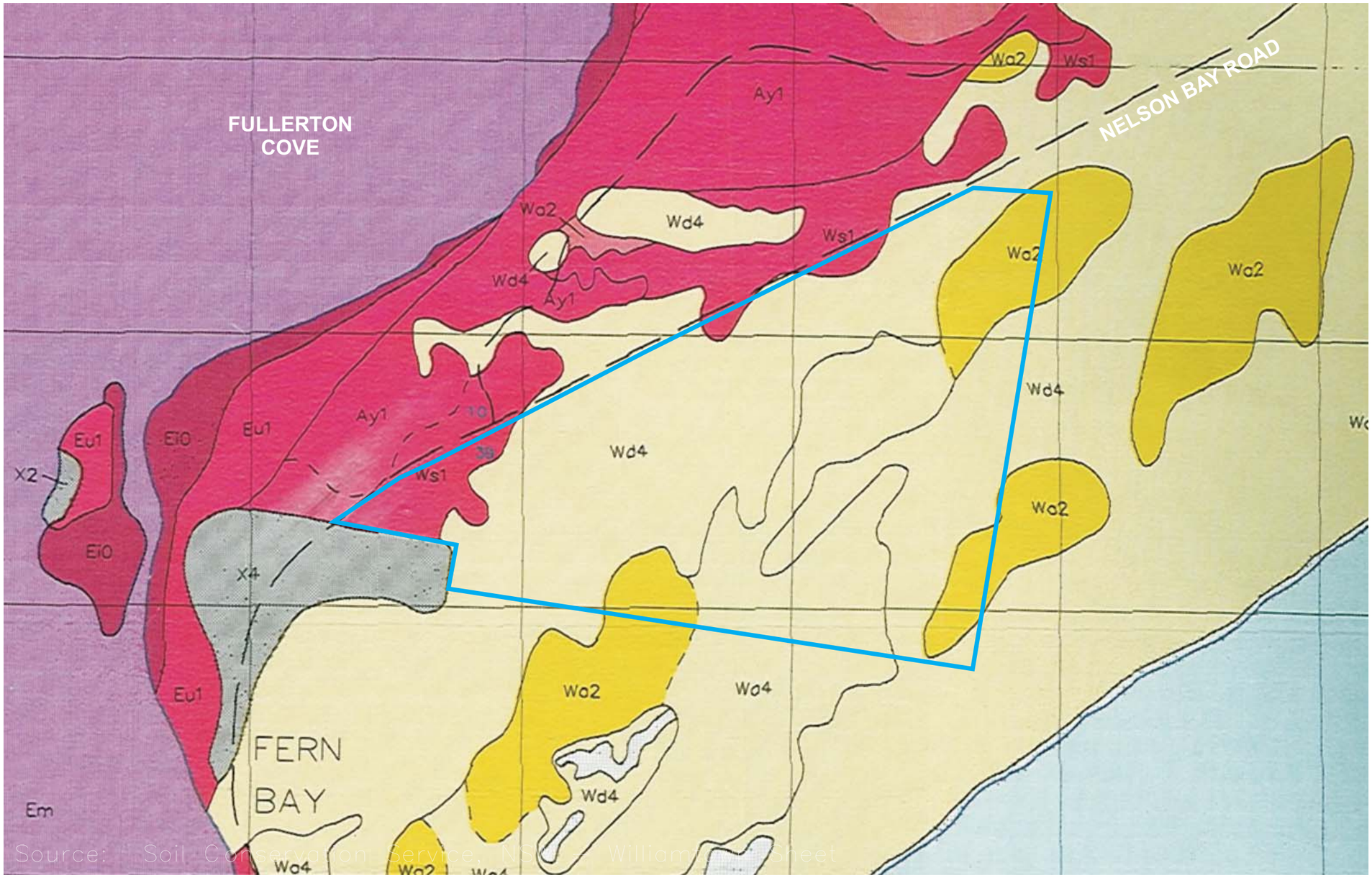
The report prepared by RCA details the findings of a Phase I Environmental and Acid Sulfate Soil Assessment within the project area of the Fern Bay Seaside Village (refer *Annex T*).

The report reviewed historical information about the site and concludes that there is no potentially contaminating activities undertaken on the site. The most significant potential source of contamination remains illegal dumping of vehicles and rubbish and surface water run-off from Nelson Bay Road.

The report concluded that the site is suitable for the proposed residential development. A plan showing the acid sulfate soils across the site is contained in *Figure 7.6.* The report recommended that an Acid Sulfate Management Plan be developed to ensure that environmental and human health risks associated with potential ASS are appropriately managed.

An Acid Sulfate Soil Management Plan will be developed as part of the detailed geotechnical assessment for each stage of the proposed subdivision to ensure ASS management requirements are appropriately identified to align with the specific risks of ASS within each stage of the proposed development. The proposed structure and content of each ASSMP is:

- Introduction;
- Site conditions and proposed development;
- What are acid sulfate soils;
    - Background information;
    - Significance;
- ASS and the development of Fern Bay Seaside Village;
- Potential for oxidation of Acid Sulfate Soils;
- Management of exposed Acid Sulfate Soils;
    - Neutralisation;
    - Dewatering;
- Monitoring;
    - pH Monitoring;
    - Water Monitoring;
- Contingency Plan; and
- Conclusion.



Legend

- Fern Bay Seaside Village
- High Probability - within 1m of ground surface
- Low Probability - between 1 and 3 metres below the ground surface
- Low Probability - greater than 3 metres below the ground surface

Figure 7.6

Acid Sulfate Soils on Site

Client:	Aspen Group Pty Ltd		
Project:	Fern Bay Seaside Village		
Drawing No:	0063154hv_Planning_15		
Date:	10/02/09	Drawing size:	A3
Drawn by:	SP	Reviewed by:	PD
Source:			
Scale:	Refer to Scale Bar		

N

0 500m

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7.15 COMMUNITY AND STAKEHOLDER CONSULTATION

Table 7.7 summarises the community and stakeholder consultation undertaken throughout the planning phase of Fern Bay Seaside Village. The summary demonstrates that numerous and varied groups were involved in the planning phase of the project, including;

- Non-Government Organisations;
- Community Groups;
- Indigenous Groups;
- Government Agencies;
- State Members of Parliament;
- Local Government; and
- Transport Groups.

Facilities such as an enquiries phone line and project webpage were made available to the wider community, to facilitate communication and the delivery of information. Information sessions and newsletters were also used as a means of informing the community of the project's progress.

Table 7.7 Stakeholder and Community Consultation

Date of consultation	Form of Consultation	With Whom	Role / Group
2004	Winten Property Group Webpage		
11/11/04	Meeting	Mayor, senior planners	Port Stephens Council
12/11/04	Meeting	John Bartlett	Member for Port Stephens
19/11/04	Meeting	Janet Dore	General Manager, Newcastle City Council
25/11/04	Meeting	Bryce Gaudry MP	State Member for Newcastle
25/11/04	Meeting	Steve Brown & Gary Forster	DIPNR
7/12/04	Letter	Michael Costa	Minister for Hunter
09/12/05	Phone Call	Doug Lithgow	Newcastle Parks & Playgrounds Movement
15/12/04	Meeting	Darrell Dawson, Geoff Bartlett, Roger Yeo, Frank Future	Port Stephens EcoNetwork
15/12/04	Meeting	Brian Purdue & Michael Osbourne	Green Corridor Alliance
21/12/04	Meeting	Prof Bruce Thom, Julie Conlan, Peter Nelson	DIPNR
21/12/04	Meeting	Fran Kelly	Total Environment Centre
2004	Site Visits	Local Aboriginal Land Council	Worimi Local Aboriginal Land Council
2004	Site Visit	Maaiangal Aboriginal Heritage Incorporated	Maaiangal Aboriginal Heritage Incorporated
2004	Consultation	Greening Australia	Greening Australia
2004	Consultation	Blue Ribbon & Port Stephens Coaches	Blue Ribbon Bus Company & Port Stephens Coaches
06/01/05	Meeting	Julian Green	Newcastle Airport CEO
07/01/05	Phone Call	Michelle McMahon	Resident (Medowie)
13/01/05	Phone Call	Michael Collins	Port Stephens Greens
19/01/04	Presentation	Stockton Community Forum	Stockton Community Forum
19/01/05	Site Meeting	Councillors & Senior Planners	Port Stephens Council
28/01/05	Phone call	Natalie Hiecth	DIPNR
Jan 2005	Newsletter	Community	Fern Bay, Fullerton Cove, Williamtown
03/02/05	Phone Call	Michael Collins	Resident (Medowie)
06/02/05	Phone Call	Nick Lanard	Resident (Fern Bay)
06/02/05	Email	Simon Herd	Resident (Fern Bay)
06/02/05	Written response	Michael Collins	Resident (Medowie)
09/02/05	Community Meeting	67 residents	Fern Bay Community
09/02/05	Meeting	Ben Chard	Premiers Dept & Minister for Hunter
09/02/05	Meeting	Dean Carr, Bill Bartlett, Alex Callen	Defence / RAAF
19/02/05	Community Meeting	Residents	Fern Bay Community Forum
Mar 2005	Newsletter	Residents	Fern Bay / Fullerton Cove
02/03/05	Phone call	Liz Hutchison	Resident (Fern Bay)
11/03/05	Emails	Liz Hutchison	Resident (Fern Bay)

Date of consultation	Form of Consultation	With Whom	Role / Group
14/03/05	Emails	Jason Wells	Resident (Fern Bay)
22/03/05	Phone call	Norma Hyde	Resident (Fern Bay)
30/03/05	Phone call	Susan Ayr	Resident (Fullerton Cove)
14/07/05	Meeting	13 Staff members	Port Stephens Council
21/07/05	Meeting	Statutory Planners / Urban Design Task Force	Port Stephens Council
22/08/05	Meeting	Robert Black	DIPNR
2005 -	Ongoing consultation with Government Departments and the local Aboriginal community, up to and following submission		

1. Date of Consultation may reflect single date within ongoing sequence of correspondence.

7.16 GOVERNMENT AUTHORITY CONSULTATION

Correspondence advising of the proposed Project Plan application was sent to a range of government agencies. The letters advised that the environmental assessment report was being prepared consistent with the Master Plan approval. A copy of the responses received is contained within *Annex X*.

There was only one issue raised which is objected to by Aspen. In the Department of Defence (DoD) letter dated 1 June 2007 there is a reference to requiring that a "memorial " be placed on each title to refer to potential noise. This is despite the fact that the locality is not within the 2012 Australian Noise Exposure Forecast (ANEF) contours for the RAAF Base Williamtown. It is assumed that the DoD are referring to some sort of notation on the title but this is not considered appropriate or warranted.

7.17 CONCLUSION

Assessment of key impacts has indicated that the development poses no significant impacts to the environmental, social or cultural resources of Fern Bay. Mitigation measures are recommended for several issues, and have been incorporated into the draft Statement of Commitment in *Chapter 9*.

8 JUSTIFICATION FOR THE PROJECT

8.1 INTRODUCTION

This section provides justification for the project by expanding on the following points:

- consistency with existing strategic framework;
- assessing the suitability of the site for the proposed landuse; and
- how the development is in the public interest.

8.2 STRATEGIC PLANNING FRAMEWORK

8.2.1 *Consistency with NSW SEPP 71*

The proposal is consistent with the provisions of SEPP 71 Coastal Protection. The matters listed in Clause 8 of the SEPP 71 have been addressed. Compliance with this policy provides justification for the form of the proposed development.

8.2.2 *Local Planning Policies*

Although Clause 75R (3) of the EP&A Act states that environmental planning instruments (other than State environmental planning policies) do not apply to Part 3A projects, a review of local planning policy was undertaken to ensure consistency with local government regulations.

8.3 SUITABILITY OF THE SITE

The residential development is proposed to be wholly located within the 2 (a) Residential zone. Minor sections of roads and associated infrastructure, pedestrian pathways and fire trails are proposed within those parts of the site zoned 1 (a) Rural Agriculture and 7 (a) Environmental Protection.

8.4 PUBLIC INTEREST

The development is in the public interest because the site is regionally significant by providing alternative lifestyle. The proposal will provide a range of allotment sizes to cater for the growing demand for residential land.

The siting of the subdivision has been carefully selected to minimise potential impacts on flora and fauna.

8.5 CONCLUSION

The proposal to create a unique residential subdivision at Fern Bay has demonstrated that the proposal will not have significant effects on the surrounding environment. The proposal has also demonstrated that the site is consistent with both the regional and local government framework.

9 DRAFT STATEMENT OF COMMITMENT FOR THE PROJECT

9.1 BACKGROUND

The following draft Statement of Commitments has been prepared in accordance with the Director-General's Environmental Assessment Requirements and Part 3A of the EP&A Act. These commitments outline the environmental management, mitigation and monitoring measures to be adhered to by the Aspen Group Pty Ltd throughout the life of the project to manage potential environmental impacts arising from the proposed development.

The draft Statement of Commitments has been prepared to meet the following aims:

- to ensure the development meets statutory requirements in construction and operation phases;
- to ensure consistency with non-statutory policies and guidelines applying to the proposal;
- to promote ongoing use of best-practice in the development; and
- to provide a set of conditions that are practical and economically feasible to implement.

The commitments listed in this section have been compiled based on the environmental assessment outlined in this report. They provide commitment from Aspen indicating responsibility and timing, to implement measures to ensure that the potential environmental impacts that have been identified through this assessment are managed in an environmentally, socially and economically acceptable manner.

9.2 DRAFT STATEMENT OF COMMITMENTS

9.2.1 *Subdivision Design and Layout*

The proposed development will be carried out in accordance with the Environmental Assessment Report (EAR), prepared by ERM dated February 2009, and supporting documents except where amended in this Statement of Commitments.

The Aspen will establish and construct all recreation facilities and provide for a community centre identified by the plan. Ultimately all recreation amenities and the community centre will become the property and responsibility of the

Community Association. The management of all areas of open space, any recreation facilities and the community centre will remain the responsibility of the Aspen to manage until all civil construction activities have been completed and the title is registered.

Where the Project Plan approval relates to proposed lots of less than the 500m^2 minimum contained in Port Stephens LEP 2000, these lots will be created through combined dwelling application and subdivision. The intention is to ensure consistency with Port Stephens LEP 2000 through obtaining consent for dwellings prior to creation of lots less than 500m^2.

The Community Association will remain responsible for the ongoing maintenance of the space lots which will include formal parks, the Cultural Heritage Reserve, asset protection zones, managed reserves and bushland open space.

9.2.2 Statutory Requirements

The following licences, permits and approvals will be obtained and maintained for the residential subdivision:

- Port Stephens Council Construction Certificates for engineering works (including earthworks, soil and water management, roadwork drainage) for each stage of the subdivision.
- Port Stephens Council Subdivision Certificate for each stage;
- Telstra Compliance Certificates; and
- Section 50 Certificates from Hunter Water.

9.2.3 Construction Phase

A Construction Environmental Management Plan (CEMP) will be prepared and include the following:

- a description of the work program outlining relevant timeframes for activities;
- a description of the roles and responsibilities for all relevant employees involved in the construction phase;
- the minimisation of rubbish and debris at the site from development activities during the construction phase;
- erosion and sediment control during construction;

- details of environmental management procedures, monitoring and reporting requirements during construction and operation phase;

- details of statutory and other obligations that must be met during construction and operation, including all approvals and agreements required from authorities and other stakeholders; and

- an education strategy of construction contractors.

Construction Work shall be confined to 7.00am to 6.00pm, Monday to Fridays, and 7.00 to 12.00 midday on Saturday.

9.2.4 Flora and Fauna

The proposed development will result in the removal of a significant amount of vegetation. While the vegetation clearance for the proposed development will result in some loss of habitat for fauna utilising the site, this will be relatively small compared to the areas that will be retained for habitat. The following amelioration measures will be implemented by the proponent:

- mature trees will be retained where possible;

- a qualified fauna handler will be on site when clearing occurs;

- planting of suitable feed trees around areas of the site;

- the Community Land Environmental Management Plan will form part of the Community Association Management Plan; and

- the benefits of the Offset Compensation Package agreed to by the Department of Environment and Climate Change.

9.2.5 Water Cycle Management

All works will be carried out in accordance with the Stormwater Assessment and Stormwater Management Plan for the proposed residential development at Fern Bay. The report recommended a number of treatment devices to ensure that pollutants leaving the site are minimised:

- runoff from all catchment would be directed through bio-retention swales that have been designed to treat flows up to and including those with a three month Average Recurrence Interval (ARI); and

- flows up to and greater that three months ARI would be overtop the bio-retention swales and pass though vegetated filter zones prior to being discharged into natural drainage lines.

The treatment measures will be supplemented by the installation of rainwater tanks for each dwelling.

9.2.6 Erosion and Sediment Control

The site contains sandy soils that may be subject to wind and soil erosion. The following management approaches will be taken to limit potential for wind and soil erosion in the proposed development:

- construction activities should be phased to minimise erosion and minimise impacts on stormwater management measures that rely on infiltration processes;
- clearing of vegetation should be minimised;
- sediment basins, silt fences and perimeter banks should be used during construction to minimise erosion and sediment transport to receiving waters;
- sediment traps and GPTs should be installed in stormwater drainage systems; and
- vegetated ground cover should be maintained or restored.

9.2.7 Hazard Management and Mitigation

The measures contained in the Bush Fire Risk Assessment prepared by Environmental Resource Management shall be adhered to. The Bush Fire Risk Assessment has made recommendations regarding appropriate asset protection zones, water supply, access road and levels of construction. These recommendations have been incorporated into the design of the subdivision.

9.2.8 Traffic Management and Access

The site is accessed via an existing roundabout on Nelson Bay Road. The Traffic Assessment Report (ERM 2009e) has indicated that the existing roundabout could cater for the additional traffic generated by the proposed subdivision.

The proposal will provide a road hierarchy that will enable the road system to cater for a specific use. The collector road to act as the main transport route through the subdivision and will provide access to community facilities and key areas of open space. The design of the internal roads will be in accordance with Port Stephens Council Subdivision Development Control Plan.

9.2.9 Heritage

The proposed development shall adhere to the recommendations of the Aboriginal Heritage Assessment Report prepared by ERM (2005b) and the Addendum Report provided in *Annex I*. The site specific recommendations are as follows:

- provision for representatives of the Aboriginal community to recover Aboriginal objects during excavation work. Local Aboriginal community representatives will be invited to monitor ground disturbing works within the project area;

- consultation with the Aboriginal community regarding interpretation of archaeological information that could be presented in the form of public display, such as interpretive signage. The endorsement of the Aboriginal community stakeholder groups will be sought on the style and content of the signage/displays;

- maintain liaison with the Aboriginal community throughout the development process;

- exclusion of the ridgeline marked blue on Figure 3.2 of *Annex I* from development and conservation within the proposed Cultural Heritage Reserve;

- obtain a Section 90 consent from the Department of Environment and Climate Change prior to the commencement of development work; and

- follow the procedure identified in the Aboriginal Heritage Assessment Report and associated Addendum (see *Annex I*) if human skeletal remains are identified during construction works.

An Aboriginal Cultural Heritage Reserve shall be created within the Fern Bay Seaside Village in order to retain an area that represents the key aspects of the Aboriginal archaeological record at Fern Bay. A second reserve, as requested by the local Aboriginal community will also be created at one of the two possible locations identified in *Figure 7.5*. The site selected will be subject to consultation with the local Aboriginal community.

9.2.10 Infrastructure Provision

The subdivision will make satisfactory arrangements with Telstra Australia for the provision of telecommunication facilities to each residential lot. The proposed development will provide reticulated potable and non-potable water supply and sewerage to each residential lot.

10 CONCLUSION

The proposed development is consistent with the Master Plan approval endorsed by the Minister in August 2006 and will contribute to the achievement of the strategic objectives for population growth which is contained in the Lower Hunter Regional Strategy.

The Village will provide a range of housing choice for future residents. This will be achieved through the range of lots sizes proposed and the urban design guidelines which will assist the future residents in maintaining a high standard of urban design.

The proposed development footprint will be confined to that area already established by the Minister as being appropriate for urban development through the adoption of the Master Plan.

With appropriate mitigation and management measures, including water quality controls, restrictions on built form to achieve a high level of residential amenity and implementation of bushfire risk management measures, the proposed development will not result in any significant environmental impacts.

The Offset Compensation Package agreed to by the Department of Environment and Climate Change will provide considerable benefit to both the local community and Worimi Regional Park.

The justification provided in the preceding chapters presents a strong case for the Fern Bay Seaside Village to be developed in the manner proposed provided all the environmental enhancement and mitigation measures discussed in the draft statement of commitments are implemented in a timely fashion.

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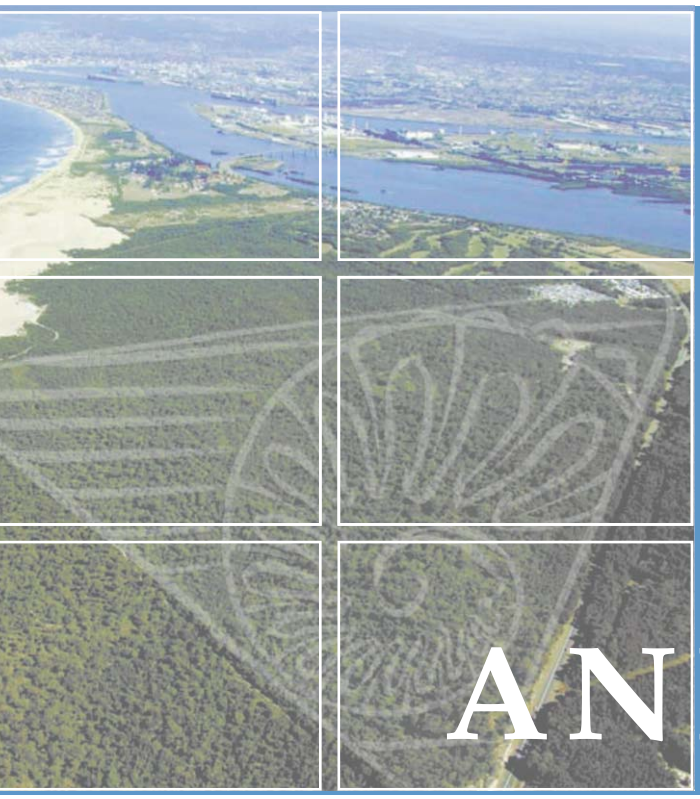

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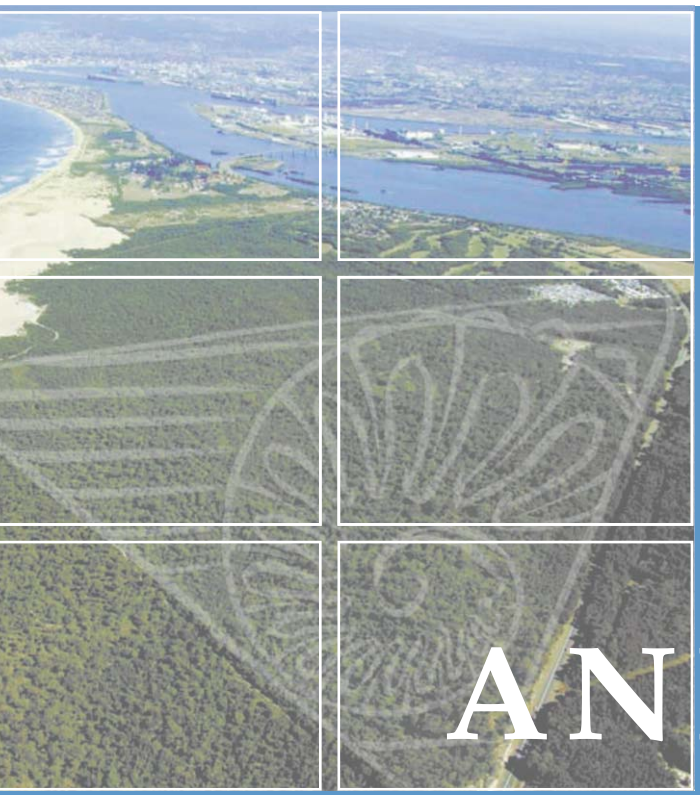

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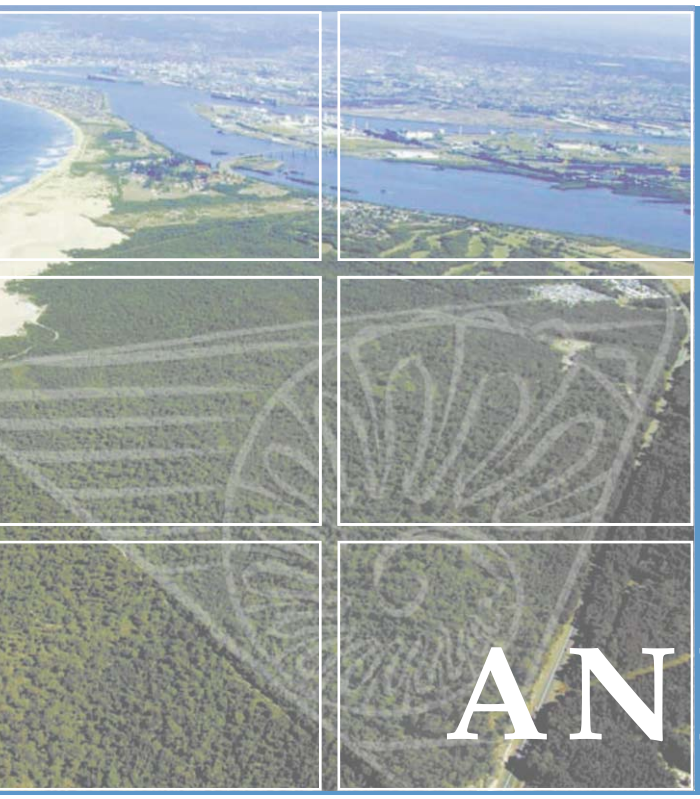

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Government Authority Responses

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