ANNEX T

Acid Sulphate Soils and Contaminated Lands

LIMITED PHASE 1 ASSESSMENT

ACID SULFATE SOILS AND CONTAMINATION OF SOILS FERN BAY ESTATE, FERN BAY

Prepared for

ASPEN LIVING

Prepared by

RCA AUSTRALIA

RCA ref: 6067-002/1
CLIENT ref: nil provided

June 2007

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June 21, 2007

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Attention: Peter Fagan

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

Geotechnical Engineering
Engineering Geology
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LIMITED PHASE 1 ENVIRONMENTAL ASSESSMENT
ACID SULFATE SOILS AND CONTAMINATED LANDS
FERN BAY, NSW

1 INTRODUCTION

This report assesses the potential presence of acid sulfate soils (ASS) and contamination of land within the project area of the Fern Bay Estate. The project area is those parts of the estate outside of the already approved Stage 1 roads and subdivision works.

The report was commissioned by Peter Fagan, of Aspen Living Property Group. The contamination and ASS status of soils within the project area is required for the development assessment and approval process, to be undertaken under Part 3A of the *Environmental Planning and Assessment (EP&A) Act, 1979.* A number of reports relevant to this assessment have previously been prepared, and are referenced throughout this report.

A review of historical photographs and other resources has been undertaken to characterise the site. Existing site investigation data has been reviewed and the observations of a recent site visit are provided. Results and conclusions have been provided in relation to the application for development approval for subdivision and residential uses of the site.

2 SITE DESCRIPTION AND LOCATION

2.1 LOCATION

The Fern Bay Estate is located off Nelson Bay Road at Fern Bay, NSW. It is a roughly triangular area which is situated between Fullerton Cove and Stockton Beach, on the northern side of Fern Bay and approximately 5 km north of the Newcastle CBD. Refer to Drawing 1, Appendix A, for the site locality, and Drawing 2, Appendix A for a recent aerial photograph of the site.

2.2 LOT AND DP NUMBER

The project area is Lots 3 and 5 of DP 270466. Lots 1 to 5 of DP 270466 were previously part of Lot 16, DP 258848 prior to subdivision in 2001. The approved Stage 1 works area is primarily located within Lot 4, DP 270466.

2.3 DESCRIPTION OF THE SITE

The proposed project includes development of approximately 700 residential sites on approximately 90 hectares located to the east and west of the Stage 1 subdivision area. The site layout can be seen in the Concept Plan (ERM 2006, Ref [3]) included as Drawing 3, Appendix A. The Concept Plan includes approximately 75 hectares to be managed as ecological conservation areas.

Prior to the Stage 1 works, the site was essentially undeveloped. The site is bound on the eastern side by native vegetation and sand dunes with the Stockton Bight/Pacific Ocean beyond, by Nelson Bay Road to the north-west, a relocatable home village and Newcastle Golf Course to the south and the Boral Sand Quarry to the north.

The site can be divided into three main topographic and landform areas as follows:

- Gentle to steep undulating relic sand dunes across the majority of the Stages 1 and 2 of the proposed Fern Bay Estate. Existing surface slopes in the area of sand dunes range up to 20-30^{o}.

  Photograph 1 in Appendix B shows a typical cross-section of the site which was cleared for Stage 1 works, and photograph 5 shows the northern end of the site where the fire trail road has been constructed.

- A series of low-lying swampy areas divided by low sand rises / ridges between Nelson Bay Road and the western margin of the sand dunes. The alignment of the entry road is primarily within this area.

- Low lying drainage basin along the eastern side of Stage 1 of the Fern Bay Estate.

Photographs 1 to 3 in Appendix B show this basin area.

Drainage across the site is generally expected to be towards the low-lying swampy areas between Nelson Bay Road and the western margin of the sand dunes and the drainage basin to the east of Stage 1.

The site has a couple of existing tracks which traverse it, though these appear to have low level but constant usage, possibly providing assess for beach fishing. The decaying remains of the Sygna which was ship wrecked in 1974 is located to the north-east of the site.

2.4 DESCRIPTION OF SURROUNDING NEIGHBOURHOOD

The site is located between the Pacific Ocean which is approximately 500m to the south east at the nearest part of the Estate, and Fullerton Cove which is part of the Hunter River Estuary is located a similar distance to the north west of the site,

The surrounding lands are generally native vegetation, with the relocatable home village and Nelson Bay Road being the nearest developed areas.

To the south of the relocatable home village is Newcastle Golf Course greens and facilities and beyond them the township of Fern Bay are the closest sensitive sites.

The closest environmental feature is the swamp land on the western side of the site, which generally drain through farming lands in a westerly direction towards Fullerton Cove and the Hunter River Estuary.

The Estate is located within the area of the Water Sharing Plan for the Tomago Tomaree Stockton Groundwater Sources (DIPNR 2004), specifically within the sub-area of the Stockton Groundwater Sources (being the area generally from the ocean up to approximately 4 km inland along the Stockton Bight). Potential interactions with the groundwater in the area are controlled through this plan.

3 SITE HISTORY AND BACKGROUND INFORMATION

The Fern Bay Estate is approximately 205 hectares in area. It 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 2000* (ERM 2006, Ref [3]).

The proposed development is largely confined to the Residential Zoning area, with access roads and other essential infrastructure being the exception. Refer to the Concept Plan (Ref [3]), included in Appendix A, for the location of the development areas.

The project proposal includes a number of land uses, with the most sensitive being residential development. Other land uses will include a range of open space uses, plant nursery, recreation and community facilities, roads, trails and fire trails, stormwater and other infrastructure, and fire (asset protection) buffers (Ref [3]).

3.1 LAND USE – PREVIOUS, PRESENT AND PROPOSED

A historical title search was undertaken, as summarised in Table 1 and included in Appendix C. The title identifier for the project area prior to subdivision in 2001 was Lot 15 DP 258848. Historical photographs have been used in the assessment of previous site usage.

Table 1. *Summary of Proprietors for Lot 16 DP 258848 **

Year	Proprietor Source	
2001	Winten (No 20) Pty Ltd	Current Certificate of Title
1991 – 2001	Howship Holdings Pty Ltd	Transfer by Mortgagee – Power of Sale 7554559 Transfer E 27800
1973 – 1991	AHL Town Developments Pty Ltd (previously known as Hooker Town Developments Pty Ltd)	Transfer E 27800 Vol. 13840 Fol. 40 Vol. 13535 Fol. 47 Vol. 11063 Fol. 80 www.search.asic.gov.au
1967 – 1973	Ian Campbell Smith (Farmer), June James, Florence Caroline Jeffery & Nancy J Smith	Primary Application 46344
1966 – 1967	Andrew William Swan & Ian Campbell Smith	Primary Application 46344
1895 – 1966	Stanley William Smith	Primary Application 46344

* Lot 16 DP 258848 was subdivided into Lots 1 to 5 DP 270466 after 2001.

The site had been essentially undeveloped. The first land title was issued in 1895 and the land has never been substantially occupied. The existing vegetation is over-mature forest and swamp lands, with no visible signs of historical development.

The site vegetation is dominated by Eucalyptus and Angophora species and undergrowth on drier sand dune areas. Melaleuca species, reeds and palm trees dominate the swampier areas and coastal scrub and heath prevail along the eastern and southern sides of the Stage 1 area.

The Stage 1 works of the present development were constructed between 2003 and 2006, and include the:

- main entry roadway;

- subdivision area;
- approximately 30 houses at the time of the site visit (out of 208 approved lots); and
- an emergency access (bushfires) roadway which re-joins Nelson Bay Road about 1000 m north of the main access road into the site.

3.2 HISTORICAL USE OF ADJACENT LAND

The Fern Bay Estate is currently located within an area of mature native vegetation, with the only exception being the relocatable home village and Nelson Bay Road.

Nelson Bay Road forms the north-western side of the project area, it has been in existence since at least the1970's.

To the south-east of the site is a relocatable home village which was constructed after 1975, and which has been recently re-developed. The village occupies about five hectares of land.

On the central southern boundary to the south of the relocatable home village is the Newcastle Golf Course which was established in 1915. Except for a period of military occupation and defensive emplacements during World War II, the golf course has been in continuous operation since establishment.

Up to about 2001, the dunes to the east of the site were mined for heavy metals including rutile, zircon and ilmenite (Mining Lease 1414). This area is proposed for future recreation or national park uses.

The north-eastern side of the site is occupied by the Boral sand quarry. The Boral site is generally forested except for the sand extraction area which is to the north-east of the Estate boundary.

Another significant land use in the locality is the military field training (live firing) and rifle range further to the south.

3.3 REVIEW OF AERIAL PHOTOGRAPHS

A series of aerial photographs of the site has been viewed to develop a time sequence for the development of the site.

The 1971 orthophoto (DPI, 1975) of the site has been reviewed. The site today appears unaltered from the 1971 appearance with the exception of the preliminary development of the residential subdivision. The Nelson Bay Road is clearly visible on the western side of the site, and the electricity easement is visible as a clearing on the east side of the site. Some clearing along the northern property boundary also appears to have been undertaken, and tracks are clearly evident to the north and south of the site.

Later aerial photographs show the development of the relocatable village and there is at least one track visible along the eastern boundary of the site running generally parallel to the beach and one generally though the site in an east – west direction.

3.4 REVIEW OF PREVIOUS REPORTS

Our understanding of the site is based in part on previous site reports:

- Fern Bay Preliminary Assessment Report for a Concept Plan Application (ERM 2006) (Ref [3]);
- Geotechnical and Acid Sulfate Soils Investigation, Proposed Fern Bay Development Stages 1 and 2, Off Nelson Bay Road, Fern Bay/Fullerton Cove.(RCA Australia, July 2004, Report 4032-003/0) (Ref [4]); and
- Acid Sulfate Management Plan for Stage 1 and 2 road works (RCA Nov 2004 Report 4032-007/0) (Ref [2]).

3.5 LOCAL USAGE OF GROUND/SURFACE WATERS

There are no registered boreholes on the site.

A small number of Hunter Water boreholes are registered to the east of the site, with sand mining being previously undertaken in this area. This mining will have intersected the groundwater. However, the mining process is understood to have no significant impacts on local groundwater quality.

There are no known discharges to land, water and air to the site from previous land uses.

3.6 ACID SULFATE SOILS

Estuarine sediments of coastal NSW from the Holocene geological age contain iron pyrite, the main constituent of acid sulfate soils. The Holocene sediment is found below and up to 5m Australian Height Datum (AHD) typically in coastal and floodplain areas. The sediment can be divided into classes based on its oxidation state. If the pyritic material above the water table is being oxidised and has a pH <4.0 it is called actual acid sulfate soil (AASS). If the pyrite material is below the water table and has not been oxidised, it is termed potential acid sulphide soil (PASS) and generally has a pH of >4.0. The pH has the potential to become much lower when the soil is exposed to oxygen. Sediment, which after the addition of hydrogen peroxide has a pH <2.5 strongly indicates the presence of ASS (Ref [1]).

The ASSMAC Guidelines outline an Action Criteria based on Acid Sulfate Soil analysis. These are based on three broad texture categories, and can be seen in Table 2.

Table 2. *Acid Sulfate Soils Action Criteria for Different Texture Categories*

Texture Action Category	Texture range	Approx clay content (<0.002mm) %	Action Criteria	
			Sulphur trail % S oxidisable (oven dry basis)	Acid trail mol H^+/tonne (oven dry basis)
Coarse	Sands to loamy sands	≤5	0.02	12
Medium	Sandy loams to light clays	5-40	0.05	31
Fine	Medium to heavy clays and silty clays	≥40	0.1	62

The existing ASS sampling is considered acceptable for this stage of the work as the general distribution of ASS across the site is reasonably well understood. Only part of the site is to be developed and minimal excavation is proposed on the development.

3.6.1 ASS MAPPING

The Williamtown Acid Sulfate Soil Risk Map indicates that:

- There is a high probability of acid sulfate soil materials within 1m of the ground surface across the low-lying area of the site of the proposed development. These conditions occur in the vicinity of the intersection of Nelson Bay Road and Fullerton Cove Road.

- There is a low probability of acid sulfate soil materials between 1m and 3m below the ground surface and greater than 3m below the ground surface across the remainder of the site of the proposed Development.

3.6.2 *PREVIOUS ASS INVESTIGATIONS*

Substantial field investigations have been undertaken within the entry road and the roads within Stages 1 and 2 to assess geotechnical and ASS characteristics of the site (Ref [4]).

The subsurface conditions were described as being Quaternary sand. These were described as barrier sand overlying, tidal delta deposits (sand) overlying at significant depth (30-40m) channel sands or Pleistocene estuary deposits (clays). This site has been observed to comprise sand to a significant depth.

Test pits undertaken at the site encountered top soil and swamp deposit on swamp sites, overlying sands, while on drier sites the surface sands had some organic mater and roots to 0.25 to 0.5 m depth. Some indurated (weakly cemented) sand was encountered at 0.5 to 1.0 m depth. Groundwater was encountered at 0.5 to 1.5 metres in six of 31 test pits (Ref [4]) consistent with previous conditions encountered in previous studies (Douglas Partners 1998). That report noted that groundwater was present at shallow depths across low-lying areas of the site.

3.6.3 *ACID SULFATE SOILS DATA*

Limited acid sulfate soil analysis was undertaken as part of the previous geotechnical and environmental investigations at the site (Refs [2] and [4]) and the results are summarised in Table 3.

Table 3. *Summary of Acid Sulfate Soil Analysis by Chromium Reduction Technique – Proposed Fern Bay Development*

Test Pit	**Depth** (m)	**Soil Type**	**Reduced Inorganic Sulphur** (%Scr)	**TAA** pH	**Total Actual Acidity (TAA)** mole / Kg	**Potential Acidity Neutralising Calculation** Kg Lime / m^3 (based on %Scr)	**Potential Acidity Neutralising Calculation** Kg Lime / m^3 (based on TAA)
TP2	0.2-0.4	Organic SILT	0.037	5.56	0.000	0.9	0.0
TP2	1.0-1.5	SAND	**0.139**	5.80	0.000	5.7	0.0
TP4	0.4-0.5	Organic CLAY / SILT	**0.105**	5.41	0.005	0.9	0.1
TP6	0.2-0.3	Organic CLAY / SILT	**0.067**	5.82	0.000	0.8	0.0

Test Pit	**Depth** (m)	**Soil Type**	**Reduced Inorganic Sulphur** (%Scr)	**TAA** pH	**Total Actual Acidity (TAA)** mole / Kg	**Potential Acidity Neutralising Calculation** Kg Lime / m^3 (based on %Scr)	**Potential Acidity Neutralising Calculation** Kg Lime / m^3 (based on TAA)
TP6	0.7-0.8	SAND	**0.124**	5.88	0.000	5.1	0.0
TP8	0.1-0.2	Organic SILT	0.027	3.78	0.185	0.6	6.6
TP8	0.8-0.9	SAND	0.005	4.89	0.013	0.2	1.0
TP20	0.8-1.2	SAND, with some silt	0.002	4.20	0.030	0.1	1.7
TP20	1.5-1.9	SAND	0.009	4.35	0.015	0.4	1.0
TP24	0.1-0.2	Silty SAND	0.004	4.50	0.062	0.1	3.3
TP24	0.7-1.0	SAND	0.003	4.86	0.011	0.1	0.7

* **Bold** indicates samples that were above the ASSMAC Guidelines (Ref [1]).
Source Ref [4].

The results of the acid sulfate testing indicate:

- no actual acid sulfate soils were encountered; and
- potential acid sulfate soils were identified in 4 of the 11 samples with sulphur levels in excess of the action criteria (using the Chromium Reducible Sulfur technique).

It is noted that the four potential acid sulfate soil samples occurred at depths ranging from 0.2 to 1.5 metres, and were taken from both topsoil/swamp deposits and fine-medium grained sand deposits. The samples were also taken from levels both above and below the groundwater table.

3.7 CONTAMINATED SOILS

The site has been essentially undisturbed by major development. However, there is potential for minor or illegal operations to have impacted on the project area, and this has been assessed in this report by review of aerial photographs and visual inspection undertaken by an experienced RCA environmental scientist.

3.7.1 CONTAMINATION SAMPLING

The known site history suggests that the site has not been subjected to contaminating activities. Potential sources of contamination were considered during the field traverse.

4 FIELDWORK

A senior environmental scientist experienced in site assessments undertook the site traverse on the 24 May 2007 using a 4WD vehicle. The site covers a substantial area, and the vehicle traverse was undertaken to enable the site to be investigated in a timely manner. Due to the uniform and undisturbed nature of the site, this was considered acceptable. The site traverse identified the general condition of the property, and particularly conditions within the Stage 2 and 3 development areas.

Surface water was present at a number of low lying areas (which were generally close to Nelsons Bay Road) and were possibly due to rains having occurred within 48 hours of the visit. In general, however, the surface soils were dry loose sand.

The existing tracks within the site (including the formed roads) were traversed, with excursions off these roads being undertaken at a number of areas to broaden the area observed. These excursions resulted in temporary bogging of the vehicle on a number of occasions due to loose sand, and limited the number of excursions off the roadways. This is not considered to affect the findings of this report regarding potential contamination sources.

The site features essentially undisturbed over-mature native forest, with areas of swamp occurring on the western boundary and drainage areas and sand dunes on the remainder of the site. Site records indicate that the site has been substantially undisturbed for over 40 years.

The site traverse provided an overview of the site and surface evidence of previous land uses, rather than being a detailed survey. Areas having potential to be contaminated were sought but none were identified. No odours were identified during the site visit which would be associated with potential contamination of the site. On the basis of the findings of the field traverse, sampling for contamination was considered unnecessary.

The previous geotechnical reports have identified that on the Stage 1 area, significant movement of sand has been undertaken to reform the topography. The placement of this ‘fill’ sand was not identified during the site visit and would be hard to distinguish within the disturbed areas of the site due to the consistent nature of the material.

5 RESULTS

5.1 CONTAMINATION OF SOILS

The results of the review of existing sampling data and the limited site inspection undertaken for the whole site indicates the site is undisturbed and unlikely to be contaminated.

5.2 ASS

ASS assessment at the site has found that there is Potential ASS on the site in the swampy drainage areas where compressible organic matter is present, and in the sandy soils which underlie these organic soils. ASS will not be present in well drained sandy soils, which characterise much of the site surface. ASS was not identified in the sampling undertaken previously within the sand dune soils on this site.

Testing for ASS (Ref [4]) showed organic silt with compressible organic soils was encountered in low-lying areas of the site such as in the entry road area. These soils were up to 0.8m in depth.

ASS analysis at 0.2 to 1.5 m identified that the results were in excess of the threshold values for the respective soil types (according to the ASSMAC 1998 guidelines) for four of the samples. Consequently, these soils would be classified at potential ASS, refer to Table 4 for a summary of the Acid Sulfate Soil results.

Table 4. *Summary of Known Acid Sulfate Soils - Fern Bay Estate.*

Test Pit	**Depth** (m)	**Soil Type**	**Reduced Inorganic Sulphur** (%Scr)	**TAA** pH	**Total Actual Acidity (TAA)** mole / Kg	**Potential Acidity Neutralising Calculation** Kg Lime / m^3 (based on %Scr)	**Potential Acidity Neutralising Calculation** Kg Lime / m^3 (based on TAA)
TP2	1.0-1.5	SAND	**0.139**	5.80	0.000	5.7	0.0
TP4	0.4-0.5	Organic CLAY / SILT	**0.105**	5.41	0.005	0.9	0.1
TP6	0.2-0.3	Organic CLAY / SILT	**0.067**	5.82	0.000	0.8	0.0
TP6	0.7-0.8	SAND	**0.124**	5.88	0.000	5.1	0.0

* Only samples that were above the ASSMAC Guidelines are shown (from Ref [4])

The potential ASS soils were located at points where the elevation was below 5 m AHD. 5m AHD is the general upper limit of these soils, and therefore across the site there would be potential for ASS to occur in soils below 5m AHD where a permanent water table is present.

Ref [4] concludes that the assessment of ASS conditions at the site of the Fern Bay Estate indicates the following:

- The presence of PASS within the organic topsoil/swamp deposit layer encountered along the low-lying section of Road No.2 between Nelson Bay Road and approximate chainage 790m.
- The presence of PASS within the sands underlying the organic topsoil/swamp deposit layer encountered along the low-lying section of Road No.2 between Nelson Bay Road and approximate chainage 790m.

6 CONCLUSIONS

This report details the findings of a Limited Phase 1 Environmental and Acid Sulfate Soil Assessment within the project area of the Fern Bay Estate. The project area comprises the parts of the Estate outside of the approved Stage 1 Works.

The review of historical information, existing site data and the observations made during the site visit provided suitable evidence that the site conditions are well understood. The site is a greenfield site, with limited clearing and is wholly covered by sand. Based on previous test pit results (Ref [4]) the ground water is likely to be at 0 to 1 metres AHD across the site.

The available information about the site indicates that there have been no potentially contaminating activities undertaken on the site. The most significant potential sources of contamination remain illegal dumping of vehicles and rubbish and surface water run-on from Nelsons Bay Road.

Potential ASS has been identified within the project area as being associated with the organic top soil in the swampy area of the site, and in the sands underlying these soils. These soils were found to exist in swampy areas generally below 3m AHD surface elevation. Works in areas below 5m AHD (or where excavation below this depth is required) should incorporate an ASS sampling program during the detailed design phase to assess the specific areas to be developed.

It is considered that the site is suitable for the proposed residential development. It is recommended that an Acid Sulfate Management Plan be developed to ensure that environmental and human health risks associated with Potential ASS on the site are managed appropriately.

7 LIMITATIONS

This report has been prepared for Aspen Living in accordance with an agreement with RCA Australia (RCA) dated 1 May 2007. The services performed by RCA have been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

This report has been prepared for the sole use of Aspen Living in obtaining development approval for the further stages of development of the Fern Bay (residential) Estate. The report may not contain sufficient information for other purposes or for parties other than Aspen Living. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA Australia.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation.

Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

Yours faithfully,

RCA AUSTRALIA

Scott Evans
Senior Environmental Scientist

Paul Noonan
Principal Environmental Engineer

REFERENCES

[1] NSW Acid Sulfate Soil Management Advisory Committee, Acid Sulfate Soil Manual, August 1998.

[2] RCA Australia, *Acid Sulfate Management Plan: Proposed Fern Bay Development Stages 1 and 2, Fern Bay* prepared for Monteath & Powys Pty Ltd. RCA Report 4032-007/0, November 2004.

[3] Fern Bay Preliminary Assessment Report for a Concept Plan Application (ERM 2006).

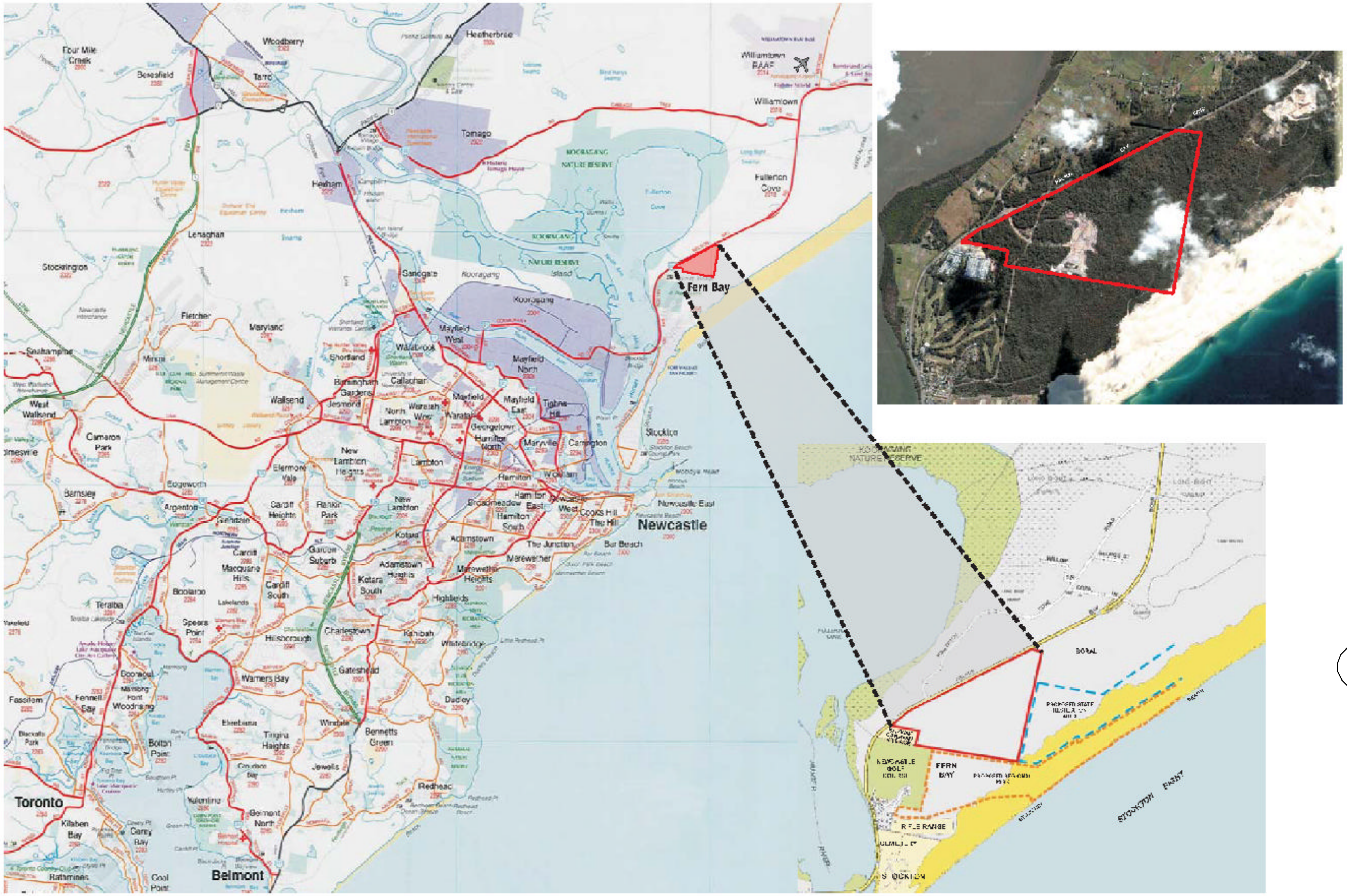
[4] Geotechnical and Acid Sulfate Soils Investigation, Proposed Fern Bay Development Stages 1 and 2, Off Nelson Bay Road, Fern Bay/Fullerton Cove (RCA Australia, July 2004, Report 4032-003/0).

GLOSSARY

Aerobic	an environment that has a partial pressure of oxygen similar to normal atmospheric conditions
AHD	Australian Height Datum (m), based on a mean sea level
Anaerobic	An environment without oxygen
ANZECC	Australian and New Zealand Environmental Conservation Council
DLWC	Department of Land and Water Conservation
EMP	Environmental Management Plan
Eutrophication	The enrichment of natural waters with inorganic material especially nitrogen and phosphorous such that they support excessive growth of plants and algae
HIL 'A'	Standard Residential Health Based Investigation Level, pg 9 Schedule B1, *National Environment Protection (Assessment of Site Contamination) Measure.*
HIL 'E'	Parks, recreational open space and playing fields Health Based Investigation Level, pg 9 Schedule B1, *National Environment Protection (Assessment of Site Contamination) Measure.*
In-Situ	in place, without excavation
Leachate	Fluid that has passed through a soil stratum, possibly collects contaminants.
LEP	Local Environment Plan. A planning tool for the local government.
QA	Quality Assurance
QC	Quality Control
SPT	Standard Penetration Test
Weathering	All physical and chemical changes produced by atmospheric agents

Appendix A

Drawings



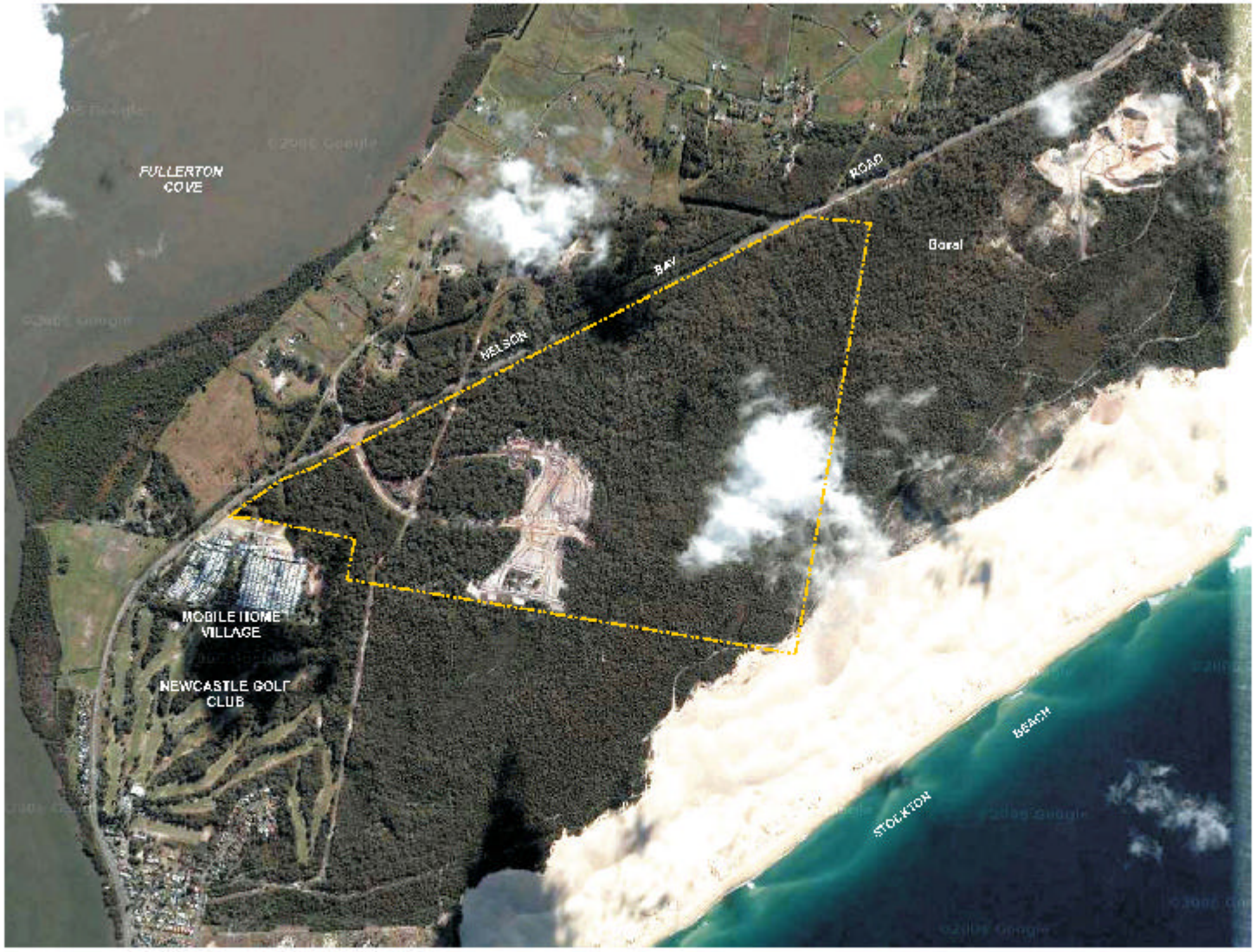
Note: 1. Drawing adapted from plan supplied by Environmental Resources Management Australia Pty Ltd, Drawing No: 2003/0012720, Figure 1, Dated: 22/8/2006

RCA AUSTRALIA

LOCALITY PLAN
FERN BAY ESTATE
FERN BAY

CLIENT	Aspen Living			PROJECT No	6267
DRAWN BY	SE	SCALE	N.T.S.	DRAWING No	1 REV 0
APPROVED BY		DATE		OFFICE	NEWCASTLE

CDT-DWG-A3H-001/1



Note: 1. Drawing adapted from plan supplied by Environmental Resources Management Australia Pty Ltd, Drawing No: 2003/0012720, Figure 2, Dated: 22/8/2006

0 150 300

metres (approximate)

RCA AUSTRALIA

AERIAL PHOTOGRAPH
FERN BAY ESTATE
FERN BAY

CLIENT Aspen Living		PROJECT No 6267	
DRAWN BY SE	SCALE N.T.S	DRAWING No 2	REV 0
APPROVED BY	DATE	OFFICE NEWCASTLE	

CDT-DWG-A4H-001/1

Note: 1. Drawing adapted from plan supplied by Environmental Resources Management Australia Pty Ltd, Drawing No: 2003/0012720, Figure 2, Dated: 22/8/2006

0 150 300

metres (approximate)

RCA AUSTRALIA

CONCEPT PLAN
FERN BAY ESTATE
FERN BAY

CLIENT	Aspen Living			PROJECT No	6267
DRAWN BY	SE	SCALE	N.T.S	DRAWING No 3	REV 0
APPROVED BY		DATE		OFFICE	NEWCASTLE

CDT-DWG-A4H-001/1

Appendix B

Site Photographs

PHOTOGRAPH 1 – View over Stage 1 clearing works. Note the ridge lines and extensive sand.

PHOTOGRAPH 2 – Close up of Stage 1 clearing works. Note the bracken.

PHOTOGRAPH 3 – Close up of Stage 1 clearing works. Note the perched water.

PHOTOGRAPH 4 – Vegetation along a track on the eastern side of the site.

PHOTOGRAPH 5 – Constructed fire escape roadway, northern entry to site.

PHOTOGRAPH 6 – Looking back at the northern entrance to the site (Nelson Bay Road behind vehicle in mid-ground).

Appendix C

Title Search

Environmental Legal Searches
Environmental Management Group Pty Ltd
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ABN 76 784 207 704

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25 May 2007

RCA PTY LTD
92 Hill Street
Carrington NSW 2294

Attention: ***Mr Scott Evans***

RE: Lot 16 DP 258848 *
Nelson Bay Road, Fern Bay

SUMMARY OF PROPRIETORS

Lot 16 DP 258848 *

Year	Proprietor	Source
2001	Winten (No 20) Pty Ltd	Current Certificate of Title
1991 – 2001	Howship Holdings Pty Ltd	Transfer by Mortgagee – Power of Sale 7554559 Transfer E 27800
1973 – 1991	AHL Town Developments Pty Ltd (previously known as Hooker Town Developments Pty Ltd)	Transfer E 27800 Vol. 13840 Fol. 40 Vol. 13535 Fol. 47 Vol. 11063 Fol. 80 www.search.asic.gov.au
1967 – 1973	Ian Campbell Smith (Farmer), June James, Florence Caroline Jeffery & Nancy J Smith	Primary Application 46344
1966 – 1967	Andrew William Swan & Ian Campbell Smith	Primary Application 46344
1895 – 1966	Stanley William Smith	Primary Application 46344

***: Lot 16 DP 258848 was subdivided into Lots 1 to 5 DP 270466 after 2001.**

Environmental Legal Searches
Environmental Management Group Pty Ltd
ACN 108 771 482
ABN 76 784 207 704

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Title Tree

Lot 16 DP 258848

Lot 16 DP258848
Transfer 7554559
Transfer E27800
Vol. 13840 Fol. 40
Vol. 13535 Fol. 47
Vol. 11063 Fol. 80
Primary Application 46344

Terms of Conditions & Limitations

1. The client is responsible for payment associated with the search.

2. The client is authorised to use our report subject to settlement of our account. Until the account is settled, the report remains the property of Environmental Legal Searches. If the account is not settled within 30 days of the invoice date, then the authority to use the report may be revoked. Where authority to use the report is revoked, all references to the report should be deleted or rendered inactive until the account is settled.

3. Search was based on **Lot 16 DP 258848** provided by **Mr S Evans of RCA.**

   The attached **Deposited Plan (DP258848)** MUST be checked against the survey plan for the property for correctness.

4. The details of the leases (if applicable) were solely based on the available records of the Department of Lands. The MOST RECENT record may not be available on the day of the searching.