Ecological Assessment Report

For
Northern Estates

At
Minmi / Link Road

Prepared for
Coal & Allied Operations Pty Ltd
PO Box 315
Singleton NSW 2330

Job Reference 24530-2 - January 2009

HARPER SOMERS O'SULLIVAN
PLANNING · SURVEYING · ECOLOGY
A member of RPS Group Plc

Prepared By:
RPS Harper Somers O'Sullivan
PO Box 428
Hamilton NSW 2303
Tel: (02) 4961 6500
Fax: (02) 4961 6794
Web: www.rpshso.com.au

PROJECT: ECOLOGICAL ASSESSMENT REPORT: NORTHERN ESTATES – LINK ROAD, MINMI	
CLIENT:	COAL & ALLIED OPERATIONS PTY LTD
OUR REFERENCE:	24530-2
DATE:	JANUARY 2009
APPROVED BY:	MATTHEW DOHERTY
SIGNATURE:	
CHECKED BY:	CRAIG ANDERSON
SIGNATURE:	

EXECUTIVE SUMMARY

INTRODUCTION

RPS Harper Somers O'Sullivan Pty Ltd (RPS HSO) has been commissioned by Coal & Allied (C&A) Operations Pty Ltd to undertake an Ecological Assessment Report (EAR) over land within Minmi - Link Road, for proposed development and conservation offsets as outlined within the Lower Hunter Regional Strategy. The proposal is to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. Due recognition and consideration of the *Threatened Species Conservation Act 1995* and the *Fisheries Management Act 1994* has been made throughout this assessment. Director General's Environmental Assessment Requirements (DGEAR's) were issued for the site in April 2008.

This study is intended to investigate the potential ecological impacts of the proposal as required by the Part 3A DGEAR's. The primary impacts are likely to be associated with the removal of vegetation both in terms of direct impacts upon native stands of vegetation and to a lesser extent, upon habitat for native fauna within and directly adjacent to the Development Estates. To ensure completeness, ecological fieldwork and assessment has covered the full extent of the C&A surplus lands, including all development and Conservation Estates.

BACKGROUND

Harper Somers O'Sullivan (2005) has previously undertaken Preliminary Vegetation Mapping over various holdings administered by C&A in the Lower Hunter Valley / Central Coast Region. This preliminary mapping was undertaken to provide a baseline dataset pertaining to the broad-scale distribution of ecological communities throughout the land holdings. This assessment was largely undertaken at a desktop level relying on aerial photography combined with existing regional mapping datasets and limited ground-truthing.

In January 2007 additional ecological investigations were undertaken following negotiations between C&A and the NSW Ministers for Planning, Environment and Lands, prior to the release of the Lower Hunter Regional Strategy.

These investigations were intended to provide a brief assessment of the conservation status of previously delineated vegetation communities.

The report herewith builds on the existing dataset, and provides the necessary level of detailed information for the assessment of the proposals under relevant legislation.

Methods

The DGEAR's stipulate assessment should have due regard to DECC's Threatened Species Assessment Guidelines. These guidelines refer the user to consult the Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (DEC 2004) and any relevant recovery plans and threat abatement plans for ecological assessment. To this end these documents have formed the core basis for ecological assessment over the site. In brief the methods employed to assess the ecological merit of the site involved the following (Note: Detailed assessment methods are presented within Section 3 of this report):

- Literature Review
- Preliminary (Desktop) Assessments
- Field Investigations
    - Flora Assessment
        - Plant Identification and Vegetation Mapping
        - Floristic Structure Information
        - Targeted and Significant Flora Surveys
    - Fauna Assessment
    - Habitat Assessment and Mapping

Results

Flora

A total of 345 flora species were identified over the Minmi - Link Road Development Estate during targeted flora surveys, including one threatened flora species and three Endangered Ecological Communities.

Threatened species include:

- *Tetratheca juncea*

  A total of 10 *Tetratheca juncea* plant clumps were located during the targeted surveys within the Minmi - Link Road Development Estate. All of these plant clumps will be removed as part of the proposal however there are over 350 plant clumps that will be retained within the Conservation Estates.

A further seventeen (17) threatened flora species have been previously recorded within the locality and/ or have potential habitat within the Development Estate. For one of these species, *Diuris praecox*, separate targeted searches were conducted during its flowering season; however no individuals of this species were located during any of the targeted searches. The remaining sixteen species were targeted during *Tetratheca juncea* and *Diuris praecox* surveys; however none were recorded within the Development Estate.

One ROTAP listed species (Briggs and Leigh, 1996) *Eucalyptus fergusonii* subsp. *dorsiventralis* was identified within the Minmi - Link Road Development Estate.

Nine vegetation communities have been delineated and described for the Link Road – Minmi Development Estate, including three listed EECs which collectively comprise approximately 55% of the study area:

- *Coastal Plains Smooth-barked Apple Woodland*

This vegetation community occupies a small area within the southern section to the south of the Link Road and encompasses 22.98 ha of the proposed Development Estate. The threatened flora species *Tetratheca juncea* was recorded within this community.

- *Lower Hunter Spotted Gum Ironbark Forest (EEC)*

This community occupies the majority of the Development Estate and covers approximately 136.82 ha or and generally occurred on the north facing slopes of the Development Estate.

- *Coastal Foothills Spotted Gum Ironbark Forest*

This community occupies approximately 170.21 ha. This community is variable with the southern areas having some *Angophora costata* as a co-dominant within the canopy layer and other areas with only Corymbia maculata and Eucalyptus *fergusonii* subsp. *dorsiventralis* as the dominant canopy species.

- *Alluvial Tall Moist Forest*

This vegetation community covers approximately 30.58 ha of the Development Estate. This vegetation community occurs within the creeklines within the Development Estate. These creeklines include Minmi Creek, Maryland Creek and Brush Creek.

- *Hunter Valley Moist Forest*

This vegetation community occurs within the steep south facing slopes within the area to the south of the Link Road. This vegetation community covers approximately 21.94 ha of the proposed Development Estate.

- *Hunter Lowland Redgum Forest (EEC)*

This vegetation community occurs in a relatively small patch in the northern portion of the Development Estate adjoining Minmi and encompasses 0.39 ha. This community is described as a highly disturbed remnant of HLRF.

- *Freshwater Wetland Complex (EEC – Freshwater Wetlands on Coastal Floodplains)*

This vegetation community occurs in the northern section of the Development Estate adjoining Minmi. This vegetation community is part of the north western edge of Hexham Swamp and covers a relatively small area of the Development Estate of approximately 0.37 ha.

- *Weeds and Cleared Areas*

This vegetation community occurs within the central portion of the Development Estate and is the result of clearing for the mining operations, unformed tracks and electricity easements. This community encompasses approximately 141.68 ha of the proposed Development Estate and is not commensurate with any vegetation communities that have been described by LHCCREMS (NPWS 2000; House 2003). These areas are highly disturbed and have high weed incursions.

- *Dam*

This vegetation community occurs as manmade dams within the cleared areas of the Development Estate, with the large dams in the north east of the Development Estate

utilised as water reservoirs for the mining operations. This community encompasses approximately 1.31 ha of the proposed Development Estate.

Fauna

A total of fifty-eight (58) threatened fauna species have been previously recorded within 10km (DECC Atlas of NSW Wildlife Data 2007) of the Development Estate (as per existing records). Of these, twenty (20) species are considered highly unlikely to occur within the Development Estate due to the absence of suitable habitat. Of the remaining thirty-eight (38) species, five (5) were recorded during fauna surveys, those being *Phascolarctos cinereus* (Koala), *Petaurus norfolcensis* (Squirrel Glider), *Pteropus poliocephalus* (Grey-headed Flying-fox), *Miniopterus australis* (Little Bentwing-bat) and *Mormopterus norfolkensis* (East Coast Freetail-bat).

A further twelve (12) threatened fauna species are considered as having a moderate or greater opportunity of occurring within the site on at least an intermittent basis, due to the existence of potential habitat within the site.

Flora Habitat

The vegetation communities present throughout the site offer a number of suitable habitat types for an array of native flora species. A number of geomorphological factors contribute to the diversity of vegetation communities present within the Minmi Link Road area. These factors include the geology, soils, elevation, topography and rainfall patterns. This range of geomorphological influences has produced a number of vegetation communities (6). 'Lower Hunter Spotted Gum – Ironbark Forest' (LHSGIF), 'Coastal Foothills Spotted Gum – Ironbark Forest' (CFSGIF), 'Coastal Plains Smooth-barked Apple Woodland' (CPSBAW), 'Alluvial Tall Moist Forest' (ATMF), 'Dams' and 'Weeds, Cleared Areas and Modified Vegetation' (WCAMV). LHSGIF within the site is of significance. This vegetation community is listed as an Endangered Ecological Community (EEC) under the *TSC Act 1995*.

The condition of the vegetation communities varies across the site and generally corresponds to close proximity to urban development, tracks and previous long history of underground mining, grazing and other associated land-use practices within the site.

A number of threatened flora species are known to occur locally within LHSGIF, CPSBAW, CFSGIF and ATMF. LHSGIF elsewhere within the region is known to contain *Grevillea parviflora* subsp. *parviflora*, *Callistemon linearifolius*, *Rutidosis heterogama* and in some cases *Tetratheca juncea*. Threatened flora species known to be associated with CPSBAW are *Tetratheca juncea, Grevillea parviflora* subsp. *parviflora*, *Angophora inopina* and *Cryptostylis hunteriana*. A threatened flora species known to be associated with CFHSGIF is *Tetratheca juncea*. Threatened flora species known to be associated with ATMF are *Melaleuca biconvexa*, *Dendrobium melaleucaphilum* and *Syzygium paniculatum*.

A number of ROTAP listed flora are known to occur within LHSGIF, including *Grevillea montana*, *Macrozamia flexuosa* and *Eucalyptus fergusonii* subsp. *fergusonii.* A ROTAP species that is known to occur within CPSBAW is *Macrozamia flexuosa*. ATMF in the region is known to contain the ROTAP listed *Callistemon shiressii*. Furthermore, at least one Regionally Significant plant species, being *Grevillea humilis* has been noted as occurring within the vicinity of the site in CPSBAW.

Fauna Habitat

The Development Estate is characterised by a moderate diversity of vegetation communities dominated by dry sclerophyll forest with relatively small areas of alluvial forest within the larger gullies. Lower drainage lines contain areas of broad slow moving water where rushes colonise and there are a few small dams within the site.

Wooded areas of the site provide potential foraging opportunities for a number of threatened fauna guilds. The diversity of eucalypt and other dominant trees are likely to provide foraging resources, including nectar and associated insect prey, for a diversity of species including common birds, Microchiropteran bats and arboreal mammals throughout the majority of the year.

The Development Estate provides few opportunities for threatened woodland bird species, such as Black-chinned Honeyeaters, Brown Treecreeper, Speckled Warbler, Hooded Robin, Turquoise Parrot or Diamond Firetail, due to its easterly location and the paucity of records for these species in the locality although there are foraging opportunities for mobile nectivorous species such as the Swift Parrot. However, habitat within the site is not considered suitable for Regent Honeyeaters, due to the low structural and floristic diversity and a lack of high quality lowland riparian habitat that this species appears to prefer in the Lower Hunter Region.

The relatively unbroken canopy stratum across much of the site is suited to arboreal mammals such as possums and gliders, including Squirrel Gliders. The Development Estates do not appear to be of sufficient extent or quality to support larger Petaurids such as Yellow-bellied and Greater Gliders, but there are abundant foraging opportunities for Microchiropteran bats and Flying-foxes.

Despite records for threatened wetland bird species within the Development Estates (Atlas of NSW Wildlife data) there are no suitable habitats, which might support these species and the records are likely due to spatial errors and the proximity to the wetlands of the Hexham Floodplain.

Understorey strata in most forested areas are relatively sparse with low densities of forest debris thus providing little cover or foraging opportunities for small mammals, birds and reptiles. Woodland areas provide greater understory diversity, although these habitats are not extensive in size. As such the Development Estate understorey habitats are largely suited to common fauna species suited to lower quality habitats. Large areas of cleared lands within the Development Estate in the vicinity of Minmi and these areas provide little habitat for more than the most common native fauna and introduced species.

Most Open Forest communities exhibit low densities of trees of sufficient maturity to provide hollows placing limitations upon those species that require this resource for nesting or shelter. Woodland and Alluvial forest habitats provide a greater number of hollow-bearing trees, but these do not occur in abundance.

Drainage lines within the Development Estate are unlikely to provide habitat opportunities for more than common frog species due to lack of suitable habitat for threatened frog species within the locality.

Swift Parrot Target Survey Results

No Swift Parrots were observed within Link Road Minmi Development Estate during the 2008 survey. Overall, the Conservation Estates exhibit greater habitat opportunities for this species, due to the greater extent of widespread habitat, predominantly Spotted Gum-Ironbark assemblages, Alluvial Tall Moist Forest, and the inclusion of riparian Red Gum communities, which are likely to represent focal habitat points for these species during seasons when they occur within the locality. The absence of this species from the site during the winter of 2008 is consistent with the paucity of coastal and Lower Hunter records for both of these species during the 2008 season. There have been few Swift Parrot records within the region compared with previous years and no local Regent Honeyeater records during the 2008 winter period apart from five recorded at Quorrobolong in early August. Evaluation of potential habitats within Conservation Estates suggests that there is a good probability that both of these species would use the site during favourable years within the region. However, the same assumptions are not considered to apply to the Minmi - Link Road Development Estates, due to the smaller amounts of suitable habitat, lack of Red Gum habitats and the somewhat isolated and to some extent fragmented nature of these lands in comparison with the extent of the Conservation Estates and their continuity to large significant forest areas in the regional context.

Conservation & Development Outcomes

The Lower Hunter Region's vegetation is of bio-geographic significance as it supports a transition between the northern and southern plant and animal assemblages. This north-south link is not evident elsewhere in the Hunter Valley. The Region also forms an east-west migratory pathway and a drought refuge for inland species.

The preservation of large vegetated areas that are linked to other similar areas has been recognised as fundamentally important to achieving long term regional biodiversity outcomes in the Lower Hunter region. The two most valued of these areas in the Lower Hunter contain large land areas owned and controlled by C&A. The first is the green corridor that links the Watagans and Yengo National Parks with the coastal plains of the Tomago Sandbeds, Stockton Bight and Port Stephens and secondly, the Wallarah Peninsula lands provide a regionally significant break between urban areas, and contain areas of high biodiversity, scenic amenity and heritage value.

The C&A lands to be dedicated form both large areas of vegetation in their own right, and complete linkage of identified regional corridors in key areas.

In addition to their important strategic location in a wider landscape context, the Conservation Estates contain valuable biodiversity resources. They contain and will conserve a range of important vegetation communities, including areas of Endangered Ecological Communities (EEC) and other vegetation types that have been depleted in the region. Several threatened plant species have been recorded within the Conservation Estates, including *Arthropteris palisotii, Tetratheca juncea* (Black-eyed Susan), *Grevillea parviflora* subsp. *parviflora*, *Eucalyptus nicholii, Rutidosis heterogama, Syzygium paniculatum* and *Callistemon linearifolius*. Two of the threatened flora species recorded in the Conservation Estates are considered to be planted specimens and not naturally occurring, being *Eucalyptus nicholii* and *Syzygium paniculatum*, although *S. paniculatum* may have been transported to its position in a disturbed area by natural means. In addition to these threatened

species two rare (ROTAP) species *Callistemon shiressii* and *Eucalyptus fergusonii* subsp. *dorsiventralis* were also identified within the Conservation Estates.

The diverse nature of both the landform settings, varying from coastal ranges forests and woodlands to coastal heath to wetlands, provides a diverse array of habitats and resources for native fauna. The Conservation Estates are known to contain important populations of numerous threatened fauna species, including birds, mammals and herpetofauna. The conservation of these lands will provide secure regional biodiversity gene pools, and also through linkages facilitate valuable genetic material exchange and other key processes associated with sustainable ecological population dynamics.

In summary, the C&A conservation dedications provide outcomes that contribute to meeting the Environmental Protection goals outlined in the Sustainability Criteria contained within the Lower Hunter Regional Strategy. Such includes:

- Outcomes consistent with the Draft Lower Hunter Regional Conservation Plan;
- Maintains/improves areas of regionally significant biodiversity;
- Maintains environmental areas for air & water quality; and
- Protects areas of Aboriginal cultural heritage value and historical heritage value.

These outcomes:

- Conserve in perpetuity key strategic parcels of land that complete long sought after regional biodiversity conservation corridors and buffer areas;
- Provide large intact areas of conserved habitat that will function as regional biodiversity gene pools;
- Protect an important array of vegetation communities, flora and fauna species, and natural landscape assets, including threatened species and EEC's;
- Contribute significantly to the successful implementation of the Lower Hunter Regional Conservation Plan; and
- Achieve additional conservation benefits within Development Estates via appropriate urban design and management practices.

Conclusions & Recommendations

The outcomes for the site as per the MoU were formulated on existing ecological information available at that time. The detailed studies undertaken herewith have confirmed that development of a small portion of the site as a whole will provide a mechanism for adequate ecological outcomes within the proposed Conservation Estates for the vast majority of species and communities contained therein. The quantum of the offset lands, when viewed holistically with proximate existing and proposed conservation reserve areas, provides a robust long-term outcome for all species and communities. Furthermore, suitable actions are proposed to minimise potentially deleterious permanent and ongoing impacts to the Conservation Estates.

The field and desktop studies have recorded the following parameters of ecological significance within both the Conservation Estates and the Development Estate:

- native vegetation commensurate with those listed as EEC's;
- threatened flora species recorded within and adjacent to the proposed development;
- threatened fauna species recorded within and adjacent to the proposed development;
- habitat for threatened flora and fauna species known from within and adjacent to the proposed development; and
- other areas containing native vegetation with varying degrees of modification / degradation.

With these potential ecological issues noted, a series of recommendations have been outlined, to aid in the reduction of potential impacts associated with the proposal.

Given that the measures have been taken to avoid ecological impacts and that where native vegetation may be affected, efforts have been made to avoid particularly sensitive areas where practical, it is considered unlikely that any significant impacts would occur upon threatened species, communities or populations. The large areas of Conservation Estates at Stockrington and Tank Paddock that will be set aside as part of the development provide excellent ecological outcomes across the site. The Stockrington Conservation Estates will contribute a large portion of land to conservation in perpetuity, which will in essence formalise the Watagan to Stockton Corridor. The importance of the conservation of Tank Paddock as part of the Conservation Estates will result in maintaining a vegetation corridor from Hexham Swamp and the Hunter Estuary to the Watagan Mountains and the Sugarloaf Range. This large tract of native vegetation will provide protected habitat for a wide variety of native flora and fauna.

Therefore, it has been concluded that the proposed development should not significantly impact upon threatened or regionally significant flora and fauna, ecological communities or populations. The implementation of operative environmental management practices should also ensure that the ecological impact of the project is minimised.

The following recommendations have been outlined to ensure that the ecological impact of the proposed Development Estate is minimised as far as possible.

- Foremost, the management of the development and conservation land interface is critical to ensure that no direct or indirect impacts occur in the short and long term on dedicated Conservation Estates. As such, appropriate management plans should be prepared and implemented within the development framework in consultation with the NSW NPWS.

- The minimum amount of clearing should take place as a general objective of the project, particularly within those areas that currently contain identified native vegetation communities. These areas have been described within this report. This is especially important within or near those areas identified as containing vegetation consistent with EEC's.

- It is recommended that a *Tetratheca juncea* management plan be prepared to ensure the conservation and long term survival of this threatened species within the Conservation Estates.

- Mature and / or hollow-bearing trees should be retained wherever feasible within the development framework.

- Pre-clearing inspections should be undertaken by an ecologist in wooded areas where threatened fauna species have been recorded or are considered likely to occur. This is particularly important in areas where threatened fauna have been noted during recent surveys either breeding or nest-building. No breeding attempts should be disrupted during the course of the project, particularly by threatened fauna.

- During the construction phase, for any tree removal within forested areas, and in particular where hollow-bearing trees may be removed, all works should be supervised by an ecologist to recover any native fauna that are potentially displaced. Furthermore, where such risks occur, site-specific ecological advice should be sought to minimise impacts during the entire process. A clearing protocol should be adopted for the removal of trees containing suitable habitat hollows as follows (this is considered as a guideline, variations on the methods employed may be required to accommodate site specific factors):

    - All hollow bearing trees are to be flagged by an ecologist prior to the commencement of works on the Development Estate.

    - Underscrubbing of the entire Development Estate should be carried out by a 4x4 tractor with a slashing deck, this will minimise the establishment of degradation processes and leave a layer of mulch to aid in soil retention in the event of adverse weather. At this time felling of non habitat trees can take place, however a matrix of trees must be maintained to allow animal movement into the designated refuge area.

    - After a period of two weeks, clearing of habitat trees should commence. Clearing must be carried out moving from the fringe of the matrix towards the refuge area. Trees should be 'soft felled' and inspected immediately by an ecologist for displaced fauna. All trees must be left for a minimum of two nights prior to being moved to a stockpile, to allow resident fauna to vacate tree hollows.

<u>Note:</u> Clearing should ideally take place outside of the dominant breeding seasons of resident fauna, preferably during late autumn and winter.

- Species selection for future landscaping works and seed stock for revegetation should be limited to locally occurring native species to maintain local genetic diversity. This should include *Eucalyptus robusta* and other regionally significant species.

- Appropriate vegetation, habitat and bushfire management plans should be included under an overarching Environmental Management Plan.

- Where possible, earthworks (and certainly all works in the vicinity of drainage lines) should be undertaken during appropriate (i.e. dry) weather conditions. This will ensure that any potential erosion events will be intercepted and that downstream impacts are minimised within any of the drainage lines. This will help to maintain existing habitat characteristics for native fauna in those areas, including those for threatened species.

- Nutrient and sediment control devices should be erected pre-clearing and post-construction works in sensitive areas where degradation processes may be triggered such as areas adjacent to watercourses until suitable rehabilitation has occurred to maintain surface integrity. Furthermore, stockpiles should be subject to individual sediment and nutrient control devices.

- A vegetation management plan is recommended to be prepared to put in place weed control measures for the drainage lines within the Development Estate. In addition this vegetation management plan should include recommendations for sediment and weed control in the northern section of the Development Estate where Minmi Creek flows into Hexham Swamp.

CONTENTS

FIGURES

TABLES

APPENDICES

GLOSSARY OF TERMS AND ABBREVIATIONS

aff. – Affinity

CEEC – Critically Endangered Ecological Community

CMA – Catchment Management Authority

C&A – Coal & Allied

Conservation OR Offset Lands – Land proposed for dedication to NSW Government (as per MoU)

Development Estate – Proposed Development Lands

DBH – Diameter (centimetres) at Breast Height

DECC – NSW Department of Environment and Climate Change

DGEAR's - Director General's Environmental Assessment Requirements

DoP- NSW Department of Planning

DWE – Department of Water and Energy

EA – Environmental Assessment

EAR – Ecological Assessment Report

EEC – Endangered Ecological Community

EMP – Environmental Management Plan

EPA Act – NSW Environmental Planning and Assessment Act 1979

EPBC Act – Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

FM Act – NSW *Fisheries Management Act 1994*

ha – hectare

HBOC – Hunter Bird Observers Club

Hwy – Highway

LGA – Local Government Area

LHRCP – Draft Lower Hunter Regional Conservation Plan

LHRS - Lower Hunter Regional Strategy

MoU – Memorandum of Understanding

NPWS – NSW National Parks and Wildlife Service

NSWG – NSW Government

PFC – Projected Foliage Cover

RPS HSO – RPS Harper Somers O'Sullivan

ROTAP – Rare or Threatened Australian Plants (Briggs & Leigh 1995)

ROTAP Codes are as follows:-
2 = Geographic Range in Australia is less than 100 km
R = Rare
C = Conserved
- = Reserved population unknown

SEPP 14 – State Environmental Planning Policy 14 “Coastal wetlands”

SEPP 44 – State Environmental Planning Policy 44 “Koala Habitat Protection”

Ssp. or subsp. – Subspecies

Sp – Singular Species

Spp – Multiple Species

SSS - State Significant Site

TSC Act – NSW *Threatened Species Conservation Act 1995*

Var. – Variety

1 INTRODUCTION

RPS Harper Somers O'Sullivan Pty Ltd (RPS HSO) has been commissioned by Coal & Allied (C&A) Operations Pty Ltd to undertake an *Ecological Assessment Report* (EAR) over land within Link Road and Minmi. The proposal is to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. Due recognition and consideration of the *Threatened Species Conservation Act 1995*, *Water Management Act 2000* and the *Fisheries Management Act 1994* have been made throughout this assessment.

1.1 Background

Harper Somers O'Sullivan (2005) has previously undertaken Preliminary Vegetation Mapping over various holdings administered by C&A in the Lower Hunter Valley / Central Coast Region. This preliminary mapping was undertaken to provide a baseline dataset pertaining to the broad-scale distribution of ecological communities throughout the land holdings. This assessment was largely undertaken at a desktop level relying on aerial photography combined with existing regional mapping datasets and limited ground-truthing.

In January 2007 additional ecological investigations were undertaken following negotiations between C&A and the NSW Ministers for Planning, Environment and Lands, prior to the release of the Lower Hunter Regional Strategy.

These investigations were intended to provide a brief assessment of the conservation status of previously delineated vegetation communities.

The report herewith builds on the existing dataset, and provides the necessary level of detailed information for the assessment of the proposals under relevant legislation.

1.2 Site Particulars

Locality – The site is on the eastern side of the F3 freeway between the Newcastle Link Road and surrounds the suburb of Minmi. The site encompasses lands owned by Coal and Allied, which occur largely to the south-west of Fletcher.

LGAs – Newcastle City Council and Lake Macquarie City Council.

Title(s) – Lot 71 DP 1065169, Lot 352 DP 1108608 (formerly Lot 35 DP 800036), Lot 6 DP 1044574, Lots 2 and 3 DP 877349.

Area – The area of the proposed development site is approximately 526 hectares.

Zoning – Newcastle LEP Zones 2(a) Residential, 7 (b) Environmental Protection, 7(c) Environmental Investigation. Lake Macquarie - 7(2) Conservation (Secondary), 5 Infrastructure and 10 Investigation Zone

Boundaries – The site is bounded to the west by the F3 freeway and the east by the suburb of Fletcher. To the north and north-east is conservation land which includes Blue Gum Hills Regional Park and to the south, the majority of the land is bounded by the Newcastle Link Road, with a small section of land to the south of this road.

Current Land Use – Currently some parts of the proposed development site are being used for rural or grazing purposes. The remainder of the site is natural bushland with weed infestations evident, particularly in the drainage lines and gullies.

Topography – The Development Estate occurs across undulating topography to the west of Wallsend. In the south it straddles eastern foothills of the Sugarloaf Range and encompasses the watersheds of south-western feeder creeks of the Hexham flood plain, including the lower reaches of Minmi Creek. Lands in the south occur both sides of an east – west ridge with moderately steep flanks encompassing the water sheds of drainage lines flowing to the north and south respectively. To the northeast of Minmi the Development Estate is perched upon low ridges to the west of Fletcher that encompasses westward sloping land and ultimately the lower drainage lines to the east of Minmi.

Soils and Geology - There are three different categories of soils across the site according to Soils Landscapes of the Newcastle region (Matthei 2005).

The majority of the soil across the site is classified as Killingworth. This soil type is typical across the rolling hills around Minmi. This type of soil has low to very low fertility and high erosion potential. The topsoils of this classification are typically brownish black sand or silt loams and the subsoils are usually sand or silt clays.

A small area on the eastern side of the site closest to the Minmi and Fletcher area has two different soil types. These are the Beresfield and Bobs Farm classification.

The Beresfield soil type is typically low in fertility, highly acidic and has a high foundation hazard potential due to the shrink-swell nature of the subsoil.

The Bobs Farm classification is the soil type associated with the estuarine flats of the Tomago region. These soils generally have a high foundation hazard potential due to localised waterlogging and shrink-swell subsoils.

The majority of the Development Estate is underlain by the Newcastle Coal Measures of Permian Age with the northern section including Tank Paddock is underlain by the Tomago Coal Measures of Permian Age.

1.3 Description of the Proposal

C&A owns approximately 4,187 hectares of land in the Lower Hunter Region located within the four local government areas of Newcastle, Cessnock, Lake Macquarie, and Wyong (located in Northern Central Coast region). The sites are not required for future mining or other operational purposes. Refer to Figure 1-1, Figure 1-2 and Figure 1-3.

C&A's Lower Hunter lands, including Minmi and Link Road (Refer to Figure 1-3), are included in the LHRS for urban development and conservation. C&A is one of four major landowners within the region that play a significant role in achieving the LHRS's environmental and conservation outcomes and sustainable growth.

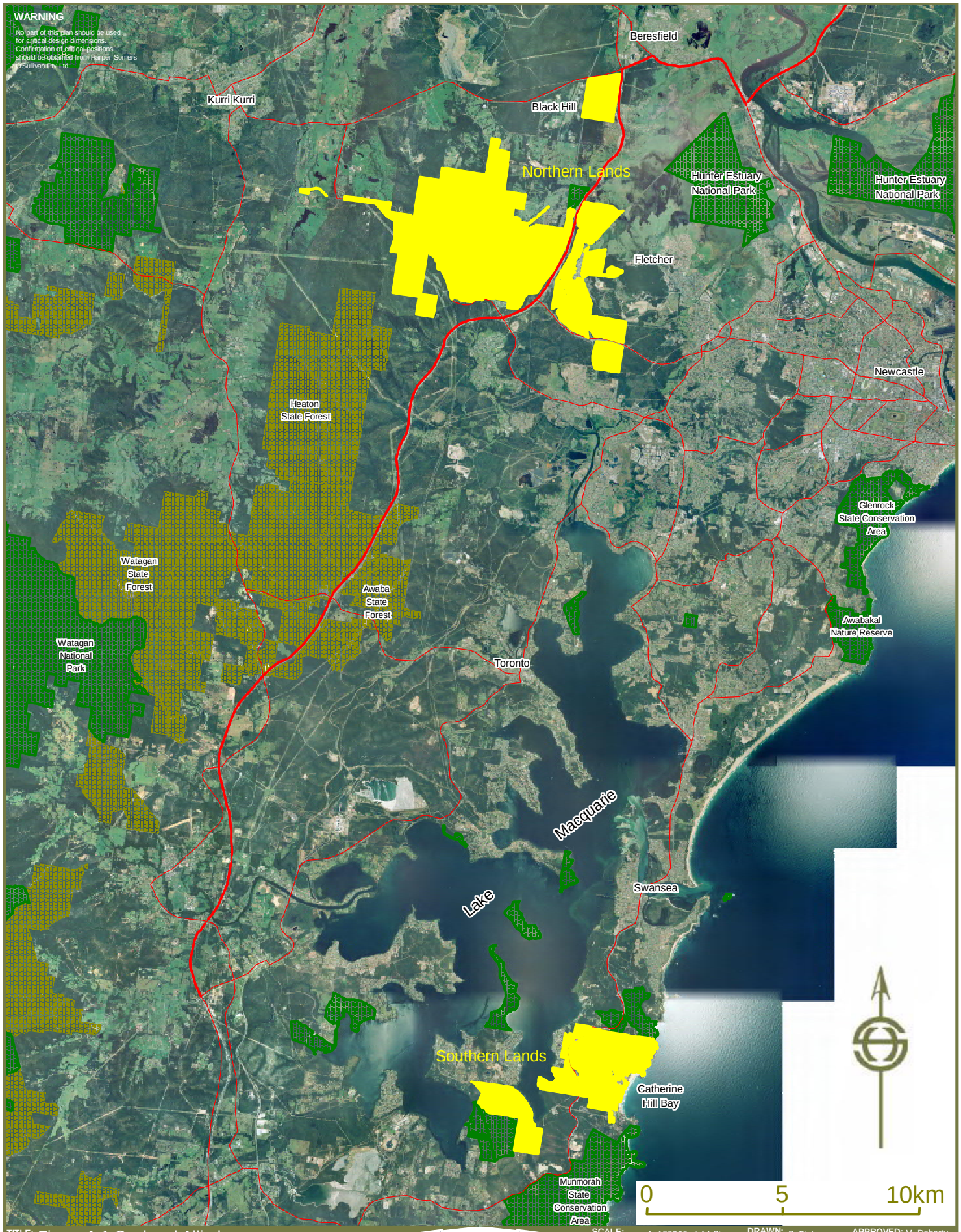
In finalising the LHRS, the NSWG reached agreement with C&A for the dedication of 3,322 ha (80%) of C&A land for conservation corridors upon receipt of development rights on 848 ha (20%).

This agreement was formalised in a MoU signed by the Minister for Planning, the Minister for Environment and the Minister for Lands, October 2007 (Appendix A). The MoU details the development and conservation of the C&A land holdings, collectively classified into 'Southern Lands' and 'Northern Lands' (Refer to Figure 1-1). The Northern Lands encompass the Minmi Link Road and Black Hill Development Estates and the Stockrington and Tank Paddock Conservation Estates (Refer to Figure 1-2).

The proposed Conservation Estates include areas of high conservation value in the nominated regional green corridors that will be dedicated to the public. The Conservation Estates are similarly identified in the draft LHRCP prepared by the DECC. Refer to Figure 1-4.

The proposal for Link Road South and Minmi is rezoning of the land to allow 3300 dwelling units encompassing approximately 520 ha of land.

A Concept Plan has been prepared for Minmi - Link Road Development Estate which will enable key site parameters associated with land use, infrastructure delivery and timing, and environmental conservation to be resolved up front, with subsequent detailed stages being submitted for approval progressively. Refer to Figure 1-5.



TITLE: Figure 1-1 Coal and Allied Surplus Lands

CLIENT: Coal and Allied Operations Pty Ltd

SCALE: 1: 180000 at A4 Size

DRAWN: S. Bishop

APPROVED: M. Doherty

DATUM: MGA Zone 56 (GDA 94)

DATE: 16/8/2007

LAYOUT REF: J:\JOBS\24k\24530 Hunter Valley\Draft ... ology\Southern Lan
ALL WORKSPACES\24530 C&A Lands FIGURE 1-1 A-A4.wo

CONTOUR INTERVAL: N/A

JOB REF: 24530-2

PLANNING SURVEYING ECOLOGY

HARPER SOMERS O'SULLIVAN

241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4961 6500 F: 02 4961 6794 E: survey@hso.com.au W:www.hso.com.au ABN 11 093 343 858

WARNING

No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from Harper Somers O'Sullivan Pty Ltd.

BLACK HILL DEVELOPMENT ESTATE

HEXHAM SWAMP NATURE RESERVE

PAMBALONG NATURE RESERVE

TANK PADDOCK CONSERVATION LANDS

STOCKRINGTON CONSERVATION LANDS

FLETCHER

MINMI

F3

SUGARLOAF STATE CONSERVATION AREA

SEAHAMPTON

BLUE GUM HILLS REGIONAL PARK

LINK ROAD-MINMI DEVELOPMENT ESTATE

NEWCASTLE LINK ROAD

WEST WALLSEND

HOLMESVILLE

LEGEND

- Proposed Conservation Estate
- Proposed Development Estate
- Conservation Reserves

0 1.5 3km

TITLE: Figure 1-2 Northern Lands

CLIENT: Coal and Allied Operations Pty Ltd

PLANNING SURVEYING ECOLOGY

HARPER SOMERS O'SULLIVAN

SCALE: 1: 46000 at A3 Size **DRAWN:** A. McConville **APPROVED:** M. Doherty

DATUM: MGA Zone 56 (GDA 94) **DATE:** 13/02/2008

LAYOUT REF: J:\JOBS\24k\24530 Hunter Valley\Draft\Ecology\Northern Lands\ALL WORKSPACES\24530 Northern Lands Location FIGURE 1-2 A-A3.wor

CONTOUR INTERVAL: N/A

JOB REF: 24530-2

241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4961 6500 F: 02 4961 6794 E: survey@hso.com.au W:www.hso.com.au ABN 11 093 343 858

WARNING
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from Harper Somers O'Sullivan Pty Ltd.

Seahampton
Minmi Creek
Minmi
Fletcher
Wallsend
West Wallsend
Cocked Hat Creek
Edgeworth
Brush Creek

0 500 1,000m

LEGEND
- Conservation Estate
- Minmi Link Road Development Estate
- Drainage Line

TITLE: FIGURE 1-3 SITE LOCATION
MINMI - LINK ROAD

CLIENT: Coal & Allied Operations Pty Ltd

PLANNING SURVEYING ECOLOGY

HARPER SOMERS O'SULLIVAN

SCALE: 1: 20000 at A3 Size **DRAWN:** A. McConville **APPROVED:** M. Doherty
DATUM: MGA Zone 56 (GDA 94) **DATE:** 13/02/2008
LAYOUT REF: J:\JOBS\24k\24530 Hunter Valley\Drafting\Ecology\Northern Lands\ALL WORK..\BlackHillReport\24530-2 Figure1-4.MinmiLinkRoad.SiteLocation.A-A3.WOR
CONTOUR INTERVAL: N/A
JOB REF: 24530-2

241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4961 6500 F: 02 4961 6794 E: survey@hso.com.au W:www.hso.com.au ABN 11 093 343 858