

State Significant Site Study and Environmental Assessment Report

Calderwood Urban Development Project State Significant Site and Concept Plan

Submitted to
Minister for Planning
On Behalf of Delfin Lend Lease

March 2010 ■ 09077

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This report has been prepared by: Lesley Bull

Signature  Date: March 2010

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- C** Director General's Requirements Compliance
JBA Urban Planning Consultants
- D** Community and Stakeholder Consultation Outcomes Report
Elton Consulting
- E** Illawarra Housing and Land Supply
Delfin Lend Lease
- F** Illawarra Regional Strategy Sustainability Criteria
JBA Urban Planning Consultants
- G** Infrastructure, Services and Facilities Implementation and Delivery Proposal
Delfin Lend Lease
- H** Economic Impacts of the Proposed Calderwood Urban Development Project
PricewaterhouseCoopers
- I** Calderwood Employment Update
Strategic Economic Solutions
- J** Assessment of Retail Floor Space Potential
Duane Location IQ
- K** Agricultural Land Study
Sphere Property Corporation
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eco logical Australia

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eco logical Australia
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Paul Davies Pty Ltd
- V** Aboriginal Archaeological and Cultural Heritage Assessment, Combined Desktop Assessment and Field Assessment Report
Austral Archaeology Pty Ltd
- W** Bushfire Planning Assessment
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Wilde & Wolland
- HH** Agency Consultation Summary

Statement of Validity

Prepared under Part 3A of the Environmental Planning and Assessment Act, 1979 (as amended)

Environmental Assessment prepared by

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Qualifications	BTP(Hons), MEL, MPIA
Address	Level 7, 77 Berry Street, North Sydney
In respect of	State Significant Site Study and Concept Plan Application

Concept Plan

Applicant name	Delfin Lend Lease
Applicant address	Locked Bag 1, Millers Point, NSW 2000
Land to be developed	Calderwood Urban Development Project Site
Proposed development	Refer to Environmental Assessment Report

Environmental Assessment

Certificate	<p>An Environmental Assessment (EA) is attached</p> <p>I certify that I have prepared the content of this Environmental Assessment and to the best of my knowledge:</p> <ul style="list-style-type: none">■ It is in accordance with the Environmental Planning and Assessment Act and Regulation.■ It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.
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Signature



Name

Lesley Bull

Date

March 2010

Executive Summary

Delfin Lend Lease (the proponent) is seeking a rezoning of approximately 700 hectares of land and a Concept Plan approval for development of the site for approximately 4,800 dwellings and 50 hectares of mixed use / employment land. Approximately 107 hectares of the site is located in the Wollongong LGA and the balance located within the Shellharbour LGA.

There are compelling reasons to proceed with the Calderwood Urban Development Project at this time when investment certainty, housing affordability, land supply and sustainable economic development are major issues of concern at the national, state and regional levels.

Delfin Lend Lease is Australia's leading developer of master planned urban communities.

A Proposal

Background

On 16 April 2009, pursuant to Clause 6 of State Environmental Planning Policy (Major Development) 2005 (the Major Development SEPP), the Minister for Planning (the Minister) formed the opinion that the Calderwood Urban Development Project constitutes a Major Project under Part 3A of the Environmental Planning & Assessment Act, 1979 (EP&A Act) and also authorised the submission of a Concept Plan for the site.

In doing so, the Minister also formed the opinion that a State Significant Site (SSS) Study be undertaken to determine whether to list the site in Schedule 3 of the Major Development SEPP.

Concept Plan

The Concept Plan proposal includes approximately 4,800 dwellings and 50 hectares of mixed use / employment land to be used for a range of retail, commercial, business and light industrial uses.

A new Town Centre and a Village Centre are to be established, incorporating a range of retail, commercial, business, light industrial, education, entertainment, civic, community, recreation, residential, tourist and visitor accommodation and mixed use employment.

The proposed development includes an open space master plan, riparian corridor network and the retention and protection of land with identified significant or contributory biodiversity for environmental conservation and / or environmental management purposes. It will deliver new roads and physical utilities infrastructure, as well as community facilities.

The Concept Plan is the planning and development framework to be used by consent and approval authorities to assess future development proposals within the Calderwood Urban Development Project site. It identifies the parameters and outcomes for future development and describes key elements of the environmental strategies that are to be implemented.

SEPP Amendment

The proposed listing of the Calderwood Urban Development Project site as a State Significant Site within Schedule 3 of the Major Development SEPP will establish a new planning and approvals regime for the site.

It is proposed to rezone the land to R1 General Residential, B4 Mixed Use, E2 Environmental Conservation, E3 Environmental Management, RE1 Public Recreation and SP2 Infrastructure (local drainage and electricity) generally in accordance with the provisions of the Standard Instrument (Local Environmental Plans) Order 2006.

The SEPP Amendment proposal also seeks to establish a number of development controls to guide future development on the site including minimum lot sizes within the R1 General Residential Zone and maximum building heights within the R1 and B4 Zones. An environmental control is proposed to ensure existing significant vegetation on the site is appropriately protected.

A Development Control Strategy is included as part of the Concept Plan proposal providing further detailed design controls for future subdivision and residential built form.

Infrastructure delivery and development contributions

The Concept Plan and SEPP Amendment proposals are accompanied by an offer to enter into Voluntary Planning Agreements with the State Government and both Wollongong and Shellharbour Councils for the delivery of infrastructure, services and utilities required to meet the future demands of the development.

This includes road network improvements, land for education facilities (primary and high schools), district and local open space, and community and human services infrastructure including a large multi-purpose community resource centre, temporary community centre and co-located branch library.

The contributions to be made under the proposed Voluntary Planning Agreements will be in lieu of Section 94, Section 94A and Section 94EF Contributions.

A detailed Infrastructure, Services and Facilities Implementation and Delivery Proposal that identifies all infrastructure, services and facilities required by the proposed development provides a coordinated delivery plan for the Project.

B Regional Land Use Planning

The Strategic Justification for the Project demonstrates that:

- The project is sustainable in environmental, social and economic terms.
- The Project is consistent with the Illawarra Regional Strategy and meets each of the Sustainability Criteria set out at Appendix 1 of that Strategy.
- The three levels of Governments are committed to proactively addressing housing supply and affordability.
- The Project can underpin the supply of residential land in the Illawarra without undermining implementation of the West Dapto Release Area (WDRA).
- The project can be delivered and serviced independently of the WDRA.
- The Project is supported by a viable implementation strategy that will leverage ready access to existing infrastructure capacity, provide structural enhancement to the regional infrastructure base and deliver savings and efficiencies in Government infrastructure expenditure.
- The site has a high ratio of urban to non urban capable land. It is relatively free of major physical and environmental constraints and is suitable for the land uses proposed. It is compatible with surrounding existing and future land uses and environmental constraints that do exist on site can be appropriately integrated, managed and / or conserved as part of the development proposal.

- Consistent with the Illawarra Regional Strategy urban development represents the most viable and effective future use of the land. The Project secures the land for this use.
- The Project has significant public benefit and is in the public interest having regard to its conservation outcomes, social and community benefits, contribution to local and regional economic growth and job creation and sustainability measures.
- The relevant criteria to support the nomination of the Project site on Schedule 3 of the Major Development SEPP are met.

Housing affordability

Housing affordability is a major policy concern at the National, State and Illawarra regional and local level.

A large number of Shellharbour residents are experiencing housing stress and there is a significant lack of affordable housing available for purchase for low and moderate income earners. The capacity of residents to purchase housing in the Shellharbour market is tight and is rapidly worsening.

The Project delivers housing affordability through increased land supply in the short to medium term, the delivery of a wide range of housing choices, matching housing choices with consumer's ability to pay and specifically targeting affordable housing solutions through product development and other initiatives including government programs. The project meets a demonstrated strategic need that delivers and maintains housing choice, diversity and relative affordability levels for Shellharbour residents.

A significant market entry level housing component will help reduce housing stress and encourage economic activity by attracting and retaining a skilled and younger labour force and increasing disposable incomes of residents.

Residential land supply

The IRS requires 38,000 new dwellings to be delivered in the Illawarra region in the 25 years to 2031.

The Illawarra UDP 2008 highlights the need to deliver approximately 780 lots (dwellings) annually within the region and given the status of existing release areas in the region, an additional major release area needs to be brought on line by 2010 to avoid a regional housing shortage, particularly for detached housing.

Calderwood is identified as an investigation area in the 2007/08 Metropolitan Development Program. It is one of the two supply sources of scale identified in the Metropolitan Development Program, along with West Dapto.

The site is nominated in the IRS as a source of alternative residential land supply if demand for additional housing arises because of growth beyond projections of the Strategy or because regional lot supply is lower than expected. It is the only alternative site specifically identified for urban release in the IRS.

It is apparent that the regional land and housing supply requirements identified in the IRS cannot be delivered in the timeframe or numbers that were expected when the Strategy was published 3 years ago. In the 3 years since the IRS was finalised, the WDRA, which was identified as the priority release area for the Illawarra region, has not commenced. At the time of writing the WDRA LEP has not been gazetted and the required Section 94 Contributions Plan not yet publicly exhibited.

There is a lack of alternative Greenfield land supply source to meet the housing demand in the Illawarra market. Key factors restricting housing delivery in the Illawarra include the heavy reliance placed in the Strategy on high annual rates of production from WDRA as a single major source of housing supply. To date no lots have been delivered within WDRA. Other existing release areas are not meeting market expectations, providing market presence or addressing affordability concerns.

Population in the Illawarra region has increased by 1.1% per annum between 2006 and 2008, which is 60% in excess of the population growth forecast under the IRS of 0.7% per annum.

Both of the criteria set out in the IRS as a trigger for consideration of Calderwood as an alternative release area have been met.

Delivering residential land to market quickly is required to support the significant additional population growth in the Illawarra.

The Calderwood Urban Development Project will underpin the IRS dwelling supply targets by providing an alternate land supply to meet a predicted dwelling shortfall in the Illawarra Region in an environment where other nominated Release Areas are under review. It can provide about 12% of the Illawarra Regional Strategy new dwellings target. It is a prudent course of action to mitigate the impact of continuing implementation challenges with the proposed WDRA to ensure smooth and timely land supply in the Illawarra.

Commencement of the Calderwood Urban Development Project is consistent with the findings of the Growth Centres Commission (2008) that in the context of the State government's policy to release as much land to the market as quickly as possible, the early release of Calderwood could be considered subject to ensuring timely delivery of local infrastructure in West Dapto. The Growth Centres Commission recognised that such additional supply of land to the market may also have benefits for housing affordability putting a downward pressure on house prices and that developers will self regulate the supply of land based on market conditions.

Impact on West Dapto Release Area supply

When published in 2007, the IRS assumed lot production from the WDRA would occur at a rate of approximately 500 dwellings per annum by 2009, after a ramp up of 150 dwelling in 2007 and 350 dwelling in 2008.

Revised estimates contained within the 2008 Growth Centres Commission Review of the WDRA suggest that a lot production rate of 300 dwellings per annum from the WDRA by 2015 is more likely, ramping up from 100 dwellings in 2010.

Based on the latest data available, lot dwelling production estimates for the Illawarra region demonstrate that with assumed production from the WDRA of an estimated 300 dwellings per annum by 2015, the Illawarra is set to experience a cumulative shortage of 8,000 homes by 2031.

Even if lot production from the WDRA was to commence in the short term, and an annual yield of 500 dwellings achieved, available data demonstrates that there would still be a cumulative housing shortage in the Illawarra by 2031.

The Calderwood Urban Development Project proposes approximately 4,800 dwellings over a 20 + year time frame, with an annual lot production of approximately 250 dwellings per annum anticipated.

The initial stages of Calderwood are approximately 10 km distant from the initial stages of the WDRA. There is therefore a significant physical separation between the new suburbs proposed. WDRA is a public sector led development, with a completely different implementation and delivery framework to Calderwood, which is a private sector led development.

Due to the significant cumulative housing shortage projected for the Illawarra to 2031, and the lack of alternative Greenfield land supply sources to meet housing demand, the Calderwood Urban Development Project will underpin the supply of land to market in the Illawarra without undermining the implementation of the WDRA.

Alternative land uses

The Project site is located immediately north west of the existing urban footprint of Albion Park and is adjacent to existing utilities and services. It is both compatible with, and complementary to, surrounding existing and future urban land uses.

The ongoing use of the site for limited existing agricultural practices does not represent the highest or best use of the land.

Existing agricultural practices on the site do not support regionally significant areas of food production. Nor does any land within the immediate vicinity of the site.

More than half of the existing rural land in the vicinity of the site has been identified by the State government for future urban development.

The Project will have nil to minimal impact on primary production values and practices of adjoining areas due to the existing limited agricultural production in the locality.

The Project will have minimum impact on regionally significant areas of food production because the site does not currently support any livestock and crop production and is not located in or close to any area of regional agricultural significance.

Any impact it might have on the small amount of adjoining land used for agricultural production will be so low when considered on a regional basis as to be imperceptible.

C Sustainability

Social

The Project delivers integrated planning and design that coordinates community, physical, transport and economic outcomes.

It will deliver a range of densities, lot sizes and dwelling types and create a diverse community that is demographically balanced. The variety of housing forms will provide opportunities to respond to changing life cycle, lifestyle and work requirements over time, enabling people to age in place. It delivers key social sustainability outcomes.

Economic

The Project will have a series of quantifiable economic benefits and positive flow on effects to neighbouring communities and business, including:

- Direct injection of an estimated \$2.9 billion into the local economy during the construction period in the form of payments to goods and service providers;
- Creation of an additional \$6.3 billion in net value for the Shellharbour economy over the project period;
- Assistance in maintaining existing employment positions particularly in the construction sector, and create an additional 8000 full time equivalent positions, with around 5,260 of these located in the Shellharbour LGA. This yields a high job containment ratio of over 60% for the development. Trip containment will contribute positively to a reduction in trip generation and to minimising the carbon footprint of the development.

As a developer lead master planned community the Project can be delivered in a manner that achieves a relatively high level of self containment in terms of employment generation, retail expenditure and vehicle trip generation. This self containment will contribute positively to reducing the carbon footprint of the development as compared to traditional Greenfields residential development.

The proposed infrastructure and servicing strategy provides for structural enhancements to the region's infrastructure base and long term synergies with other proposed release areas. It will deliver efficiencies and economies of scale in infrastructure delivery and thus improve the sustainability of regional infrastructure to support future urban growth within the wider region.

The Project will provide an appropriate level of retail floor space to support the future population without adversely impacting on known existing or planned future centres and development.

Environmental

The Project will make a positive contribution to the achievement of travel and vehicle use goals in the Illawarra. A comprehensive package of deliverable sustainable transport measures is identified to assist in achieving a 10% mode shift away from private vehicle. Measures include timely provision of facilities and services, a diversity of land uses and housing types across the project, walkable access to key amenities and an holistic approach to the design of the street network, carefully balancing the needs for vehicle movement with the needs of pedestrians and cyclists. It will form part of a larger urban area and assist in the achievement of a public transport catchment that can be serviced by economically efficient transport services.

The Project makes special provision for home based businesses and working from home in accordance with the principles of the National broadband network. Combined with employment lands and a new Town Centre and Village centre, this will reduce car dependency and trip generation rates.

The Project retains core biodiversity areas within the site and incorporates both east west and north south regional habitat connectivity. It presents a long term ownership and management regime for the protection of environmentally significant land.

The Project adopts flood plain management and water sensitive urban design measures and features that respond to an analysis of potential climate change impacts. The large size of the site and its availability for coordinated development enable the delivery of an holistic flood plain mitigation plan and water cycle management strategy that will result in a net improvement in water quality in Marshall Mount Creek, Macquarie Rivulet and as a consequence Lake Illawarra.

Water cycle management integrates with urban design, salinity risk and riparian corridor protection measures.

DLL is committed to the development of alternative technologies in its communities. The issues of carbon emissions, renewable energy targets and land tenure solutions will become increasingly relevant to new urban developments. DLL sees potential for both solar farms and co (or tri) generation as part of the Project, particularly for the Town Centre and employment precincts. Such opportunities will continue to be considered throughout the project.

Energy sustainability for the Project focuses on reducing the demand for energy through the efficient design of the urban form to capitalise on the natural features of the site. Demand will also be mitigated through consumer demand initiatives including BASIX requirements for dwelling design.

The Project adopts potable water supply conservation targets and identifies sustainable integrated options for water supply, wastewater and stormwater servicing.

D Infrastructure

Servicing strategy

The site is a significant consolidated land holding. Consolidated landholdings with scale provide the opportunity for integrated delivery of infrastructure, services and facilities.

The Project is supported by a clear and viable infrastructure servicing strategy that leverages readily accessible existing infrastructure and demonstrates that the Project can be implemented as a standalone proposal.

The Project presents an opportunity to provide infrastructure and high quality new facilities in a timely manner based on leading practice sustainability principles and sustainable funding, management and maintenance arrangements.

Whilst the Project can be implemented as a standalone proposal, the proposed infrastructure and servicing strategy provides structural enhancements to the Region's infrastructure base and long term synergies with other proposed Release Areas.

The infrastructure and servicing strategy minimises implementation risk and cost to Government by utilising DLL expertise and delivery proposals.

Independence from West Dapto Release Area

Calderwood and WDRA represent the last remaining Greenfields urban release areas of scale in the Illawarra.

Whilst the projects will be virtually contiguous when fully developed, and the timing of the release of land in both areas is likely to overlap, their respective early stages of release (ie initial development fronts) are more than 10km apart and will be supported by an entirely different services and delivery implementation mechanism – WDRA is government led, Calderwood is private sector led.

Both developments have different servicing provisions and therefore do not significantly affect each other.

The infrastructure, services and facilities implementation and delivery proposal for Calderwood demonstrates that the Project can be serviced independently of West Dapto and will not affect the provision of infrastructure for the WDRA other than positively with respect to providing structural enhancements to the region's infrastructure base.

Implementation and delivery

The Calderwood project is unique in being able to deliver the combination and scale of economic, environmental and social benefits identified. This is as a direct result of:

- Consolidated landholdings;
- Managed and predictable infrastructure and implementation planning;
- The uncomplicated nature of the proposal;
- DLL's business model, expertise and provision of financial certainty; and
- DLL's unparalleled experience in the creation and delivery of master planned communities in Australia.

Investment certainty is assured as:

- The proposal will be implemented by DLL which is wholly owned by Lend Lease Corporation.
- Urban development is core Lend Lease business. This provides implementation certainty for Government as the proposal is more than a speculative venture aimed at boosting balance sheets: it is a realistic investment proposal by a proponent with financial resources and core business skills in urban development.
- Lend Lease can meet Government prudential, funding and governance requirements.

E Environmental Impact

Detailed investigations of site constraints demonstrate that the land is relatively free of major physical constraints and has a relatively high ratio of urban capable to non urban capable land. The site analysis justifies the footprint of the urban capable land reflected in the Concept Plan proposal and the land use zoning proposal.

Land to be incorporated into the site riparian network, open space master plan and environmental conservation lands under the Concept Plan and proposed to be zoned E2 Environmental Conservation, E3 Environmental Management, SP2 Infrastructure (local drainage) and RE1 Public Recreation accords with the findings, conclusions and recommendations of detailed technical investigations.

The Concept Plan and SEPP Amendment proposal presents an holistic and integrated outcome having regard to riparian, flooding, biodiversity and water quality and quantity and other environmental outcomes.

The Strategic Justification for the Project, the Environmental Assessment and the technical supporting investigations provide a detailed assessment of the environmental impact of the proposed land use change (SEPP Amendment proposal) and Concept Plan development. It demonstrates that the proposed development is satisfactory with respect to:

- National, State and local legislative requirements, planning instruments and policy;
- Future patterns of growth and development in the Illawarra, including regional land use planning.
- Transport and accessibility, including demonstration that the cumulative impacts of traffic growth can be appropriately mitigated and managed through a series of road network improvements. The assessment has had regard to the necessary staging / timing and appropriate apportionment of cost for these works based on regional cumulative traffic growth.
- Demonstrates that the cumulative impact of the proposed development and that likely to occur in the future having regard to the identified future regional land use planning context is satisfactory with respect to regional agricultural practices and regional food production.
- Biodiversity and riparian corridors;
- Flood impact, drainage and stormwater management, including consideration of potential climate change impacts and potential increase in flood levels in the 1% AEP event. The assessment demonstrates that flood impact mitigation can be managed within the boundaries of the site, and that the proposal will not contribute to any cumulative impact in terms of flood extent or levels within the catchment.
- European and Indigenous cultural heritage impact;
- Bushfire risk assessment;
- Physical and social / community infrastructure needs and impact including the manner in which demand can be met having regard to both the demand generated by the proposed development, as well as that of other known release areas in the region including West Dapto to ensure no cumulative impact on the capacity of existing facilities and services.
- Contamination, land stability, acid sulphate soils, erosion, ground water impacts; and
- Landscape and visual impact.

All measures that have been recommended as part of the detailed technical investigations and studies to mitigate potential environmental impacts have been incorporated into the Concept Plan and SEPP Amendment proposals, or are included in the Statement of Commitments.

1.0 Introduction

On 16 April 2009, pursuant to Clause 6 of State Environmental Planning Policy (Major Development) 2005 (the Major Development SEPP), the Minister for Planning (the Minister) formed the opinion that the Calderwood Urban Development Project constitutes a Major Project under Part 3A of the Environmental Planning & Assessment Act, 1979 (EP&A Act) and also authorised the submission of a Concept Plan for the site. In doing so, the Minister also formed the opinion that a State Significant Site (SSS) Study be undertaken to determine whether to list the site in Schedule 3 of the Major Development SEPP.

This report comprises a:

- (a) Study to assist the Minister in determining whether the Calderwood Urban Development Project site should be included as a SSS in Schedule 3 of the Major Development SEPP; and an
- (b) Environmental Assessment (EA) for a Part 3A Concept Plan for the site.

The report fulfils the requirements issued by the Director General on 22 April for preparation of the SSS Study and on 10 June 2009 for the Concept Plan application.

The Calderwood Urban Development Project site is located within the Calderwood Valley in the Illawarra Region. It is approximately 700 hectares in area with approximately 107 hectares of land in the Wollongong LGA and the balance located within the Shellharbour LGA.

The Calderwood Valley is bounded to the north by Marshall Mount Creek (which forms the boundary between the Shellharbour and Wollongong LGAs), to the south by the Macquarie Rivulet, to the south-west by Johnston's Spur and to the west by the Illawarra Escarpment. Beyond Johnston's Spur to the south is the adjoining Macquarie Rivulet Valley within the suburb of North Macquarie. The Calderwood Urban Development Project site extends south from the intersection of North Marshall Mount Road and Marshall Mount Road to the Illawarra Highway.

Delfin Lend Lease (DLL) is the proponent for the proposal. Landowners' consents to the lodgement of the Concept Plan and SSS proposal are to be submitted under separate cover.

DLL is seeking Approval for the Concept Plan including:

- Approximately 4,800 dwellings and minimum subdivision lot sizes for a range of dwelling types;
- Approximately 50 hectares of mixed use / employment land to be used for a range of retail, commercial, business and light industrial uses;
- A new Town Centre and Village Centre incorporating a range of retail, commercial, business, light industrial, education, entertainment, civic, community, recreation, residential, tourist and visitor accommodation and mixed use employment;
- An Open Space Masterplan for the development, including the general location and function of passive and active open space areas to serve the future population;
- The retention, future use and management of riparian corridors that perform a significant drainage and flooding function in accordance with a Riparian Corridor Network;
- The retention and protection of land with identified significant or contributory biodiversity for environmental conservation and / or environmental management purposes;

- The Road Network Layout and Hierarchy for the site;
- Provision of associated infrastructure including a Utilities Infrastructure Strategy, Potable Water Strategy and Sewer Concept Plan;
- A Flood Mitigation Plan for integrated management of the floodplain across the site as a whole, including finished levels for re-shaping of the floodplain and importation of fill;
- A Water Cycle Management Plan for the development; and
- The location and dimension of Bushfire Asset Protection Zones.

The series of drawings illustrating the Concept Plan for which approval is sought are included at **Appendix A**.

In determining the Concept Plan, it is requested that the Minister determine that

- development for the purpose of subdivision and certain public domain/site infrastructure works (including bulk earthworks) on land that straddles the boundary between the Shellharbour and Wollongong LGAs is development to which Part 3A of the EP&A Act applies; and
- that no further environmental assessment is required for subdivision to create the boundaries of land that is to be dedicated to the State government or to Shellharbour City Council or Wollongong City Council for a public purpose, including drainage, open space / environmental reserves and education.

The proposal for inclusion of the site as an SSS at Schedule 3 of SEPP Major Development and the proposed Concept Plan is accompanied by an offer to enter into Voluntary Planning Agreements for the delivery of both regional and local infrastructure.

A Project Application for the first stage of the development has been lodged with the Minister concurrently with this Concept Plan application. The Stage 1 Project Application includes approximately 320 residential lots and lots for future integrated housing and the Village Centre, a temporary community centre, a sales and information centre, a display village, parks and associated roads and utility services.

The overall development will accommodate about 12,500 people. It will deliver \$2.9 billion in direct expenditure into the local economy during the construction period and create an additional \$6.3 billion in net value for the Shellharbour economy over the life of the project. It will create 8,000 full time equivalent jobs, with around 5,260 (approximately 60%) of these located in the Shellharbour LGA. A significant market entry level housing component will help reduce housing stress and encourage economic activity by attracting and retaining a skilled and younger labour force and increasing disposable incomes of residents.

This report has been prepared by JBA Urban Planning Consultants Pty Ltd for DLL. It is based on information provided by DLL and supporting technical documents prepared by an expert consultant team. It:

- Provides an analysis of the site and its immediate surrounds.
- Establishes the basis for change to the existing zoning and planning provisions for the site and includes a proposal to amend SEPP Major Development as it relates to the site.
- Presents a Concept Plan for the future urban development of the site.
- Provides an assessment of the environmental impacts of the proposed land use change and Concept Plan in accordance with the Director-General's Environmental Assessment Requirements.

Volume 1 of the EAR is structured as follows:

- Section 1:** Introduction, background, assessment and approvals process and overview of the consultation process undertaken by the proponent.
- Section 2:** Strategic justification including an assessment of the State and regional significance of the site and the project.
- Section 3:** Analysis of the site and its surrounds.
- Section 4:** The Concept Plan, detailing the development for which project approval is sought.
- Section 5:** Infrastructure, serviced and facilities implementation and delivery proposal, including outline of Voluntary Planning Agreements.
- Section 6:** Proposal for amendment to the Major Development SEPP, including nomination of future land use zones and planning approvals strategy for future applications.
- Section 7:** Environmental assessment of the proposed land use change and Concept Plan.
- Section 8:** Draft Statement of Commitments.
- Section 9:** Conclusion.

Volumes 2, 3 and 4 contain the Appendices which include the technical studies undertaken to inform the proposed land use change and Concept Plan and its environmental assessment, including urban design, ecology, landscape and open space, heritage, engineering (infrastructure, water cycle, flooding), traffic, economics, social and community planning, bushfire management, contamination, geomorphology, soils and geotechnical assessment.

The technical studies included at **Volume 2** address the Director General's requirements for both the environmental assessment to accompany the Concept Plan and the SSS. They provide a detailed analysis of existing site conditions, constraints and opportunities that has informed the development of the Concept Plan and SSS Listing proposals. They also provide technical assessment of the environmental impacts of the proposed development, and recommend proposed mitigation measures to manage potential environmental impacts associated with the proposal.

The expert project team formed to prepare the SSS Study and Concept Plan EA includes the following consultants:

Table 1 – Project team

Specialty	Consultant
Urban Design	Delfin Lend Lease
Urban Planning	JBA Urban Planning Consultants
Transport and Accessibility	Cardno
Infrastructure	Cardno
Ecology / Riparian	Ecological
Flooding	Cardno
Bushfire	Ecological
Landscape, Open Space and Visual	Environmental Partnership
Geomorphology	Cardno
Geotechnical	Douglas Partners
Surface and Groundwater	Douglas Partners
Acid Sulphate Soils	Douglas Partners
Contamination	Douglas Partners
Social and Community Planning	Elton Consulting
Community consultation	Elton Consulting
Noise	Wilkinson Murray
European Heritage	Ecological
Indigenous Heritage	Austral Archaeology Pty Ltd
Agricultural Land	Sphere Property Corporation
Employment	Strategic Economic Solutions
Economic Impact	PricewaterhouseCoopers
Retail	Duane Location IQ
Quantity Surveyor	Wilde and Wollard

1.1 Project Background

The Calderwood Urban Development Project site has long been recognised as a location for future urban development:

- Calderwood was identified in the Illawarra Urban and Metropolitan Development Program as a location for future urban development.
- In September 2006 Shellharbour Council formally resolved to commence the rezoning process (for that part of the Project site within its LGA) as part of its comprehensive LEP. However the Department of Planning advised that it would be premature to study Calderwood at that time.
- In 2007 Calderwood was identified in the IRS as a source of land and housing supply if demand for additional housing supply arises because of population growth beyond projections of the Strategy or if regional lot supply is lower than expected under the Strategy. Part of the area north west of Albion Park is also identified for consideration for some development in conjunction with the future consideration of Calderwood.
- In February 2008 the Minister requested DLL submit a Gateway Justification Report for the Project to address the implications of initiating the rezoning of the site, including staging, timing and infrastructure considerations. The Terms of Reference for the Justification Report incorporated assessment of the project against the Sustainability Criteria of the IRS to address the case for a change in classification of the site in the IRS and commencement of the rezoning process.

- In July 2008, following submission of the Gateway Justification Report, at the request of the Minister, the Project site was included in the GCC's review of the WDRA as the release of the site for urban development could affect the sequencing and infrastructure funding for WDRA.
- In November 2008, the GCC Review of the WDRA recognised that there is merit in the early release of Calderwood in terms of creating a higher dwelling production rate and meeting State government policy to release as much land to the market as quickly as possible.
- In February 2009 the Minister for Planning considered a Preliminary Assessment Report for the Project that provided justification for the planning, assessment and delivery of the project to occur under Part 3A of the EP&A Act, having regard to the demonstrated contribution that the project will have to achieving State and regional planning objectives.
- On 16 April 2009, the Minister formed the opinion that the Project constitutes a Major Project to be assessed and determined under Part 3A of the EP&A Act, and also authorised the submission of a Concept Plan for the site. In doing so, the Minister also formed the opinion that a SSS study be undertaken to determine whether to list the site as a State Significant site in Schedule 3 of the SEPP.

1.2 Environmental Assessment and Approvals Process

The Part 3A process under the EP&A Act allows for the Calderwood Urban Development Project to be planned, assessed and delivered in an holistic manner, with a uniform set of planning provisions and determination by a single consent authority. Given the scale of the proposal, a Concept Plan and SSS listing provide the opportunity to identify and resolve key issues such as land use and urban form, development staging, infrastructure delivery and environmental management in an integrated and timely manner.

SEPP Major Development identifies development to which Part 3A of the EP&A Act applies, and for which the Minister is the consent authority.

Clause 6 of the SEPP states that development, which in the opinion of the Minister is development of a kind referred to in Schedule 1 (Classes of Development, Schedule 2 (Specified Sites) or Schedule 3 (State significant development) of the SEPP, is declared to be a project to which Part 3A applies.

Group 5 Clause 13 of Schedule 1 of SEPP Major Development includes development for the purpose of residential, commercial or retail projects with a capital investment value of more than \$100 million.

Pursuant to Clause 8 of the Major Development SEPP the Minister may initiate an investigation into the listing of additional sites onto Schedule 3 of the SEPP, and may require the Director General to undertake a Study or to make arrangements for a study to be undertaken for the purpose of determining:

- Whether any development on the site should be declared to be a project to which Part 3A of the EP&A Act applies; and
- The appropriate development controls for the site.

The identification of SSS under SEPP Major Development aims to facilitate development, redevelopment or protection of important urban, coastal and regional sites of economic, environmental or social significance to the State.

The NSW Government uses the State significant site provisions to help it achieve the planning objectives on major sites that are important to the delivery of the metropolitan strategy or regional strategies. The provisions facilitate significant investment in economic and employment generating development in NSW and redeveloping major State government sites.

The criteria for determining whether a site is of State significance described in the Department of Planning's *Draft Guideline State Significant Sites* (July 2005) are as follows:

- (a) The site is in an identified strategic location (in a State or regional strategy), is important to a particular industry sector, or employment, infrastructure, service delivery or of redevelopment significance in achieving government policy objectives; or*
- (b) The site is important for environmental conservation or natural resources; or*
- (c) The site is important in terms of amenity, cultural, heritage, or historical significance in achieving State or regional objectives; or*
- (d) The site needs alternative planning or consent arrangements where added transparency is required because of potential conflicting interests or more than one local council is likely to be affected.*

The site meets the above criteria with respect to its identification under the Illawarra Regional Strategy, and the cross boundary planning issues associated with land that straddles the local government boundary between Wollongong and Shellharbour.

On 22 April 2009 the Minister formed the opinion that the proposed development constitutes a Major Project subject to Part 3A of the EP & A Act. The Minister also authorised the submission of a concurrent Concept Plan and Project Application for the first stage of the development. The Minister also initiated an investigation into rezoning of the site and required that a Study be undertaken to determine whether to list the site as a SSS under Schedule 3 of the Major Development SEPP.

Figure 1 below outlines the main steps in the approval process for the Major Development SEPP amendment and the Concept Plan application. Following approval of the Concept Plan, future project or development applications will be lodged for the assessment of the detailed design of the various components of the Concept Plan progressively over a number of stages.

1.3 Director General's Assessment Requirements

The Director-General of the Department of Planning issued the requirements for the preparation of the Study to justify nomination of the site as a SSS on 22 April 2009.

On 10 June 2009 the Director General issued the requirements for the preparation of the Environmental Assessments to accompany the Concept Plan and Stage 1 Project Application.

A copy of the Part 3A determination, initiation of the SSS listing and Director General's Environmental Assessment requirements (DGRs) relating to the SSS Study, Concept Plan and Stage 1 Project Application are included in **Appendix B**.

As noted above, this report comprises the Study and the EA prepared in accordance with the requirements for the Study attached to the letter from the Department of Planning dated 22 April 2009, and the Director General's Requirements for the Concept Plan dated 10 June 2009 respectively.

Appendix C details the individual matters listed in the DGRs for the Planning Study and Concept Plan EAR and identifies where each of these requirements has been addressed in this report and the accompanying technical studies.

Calderwood Urban Development Project Approvals Process State Significant Site Listing, Concept Plan & Stage 1 Project Applications

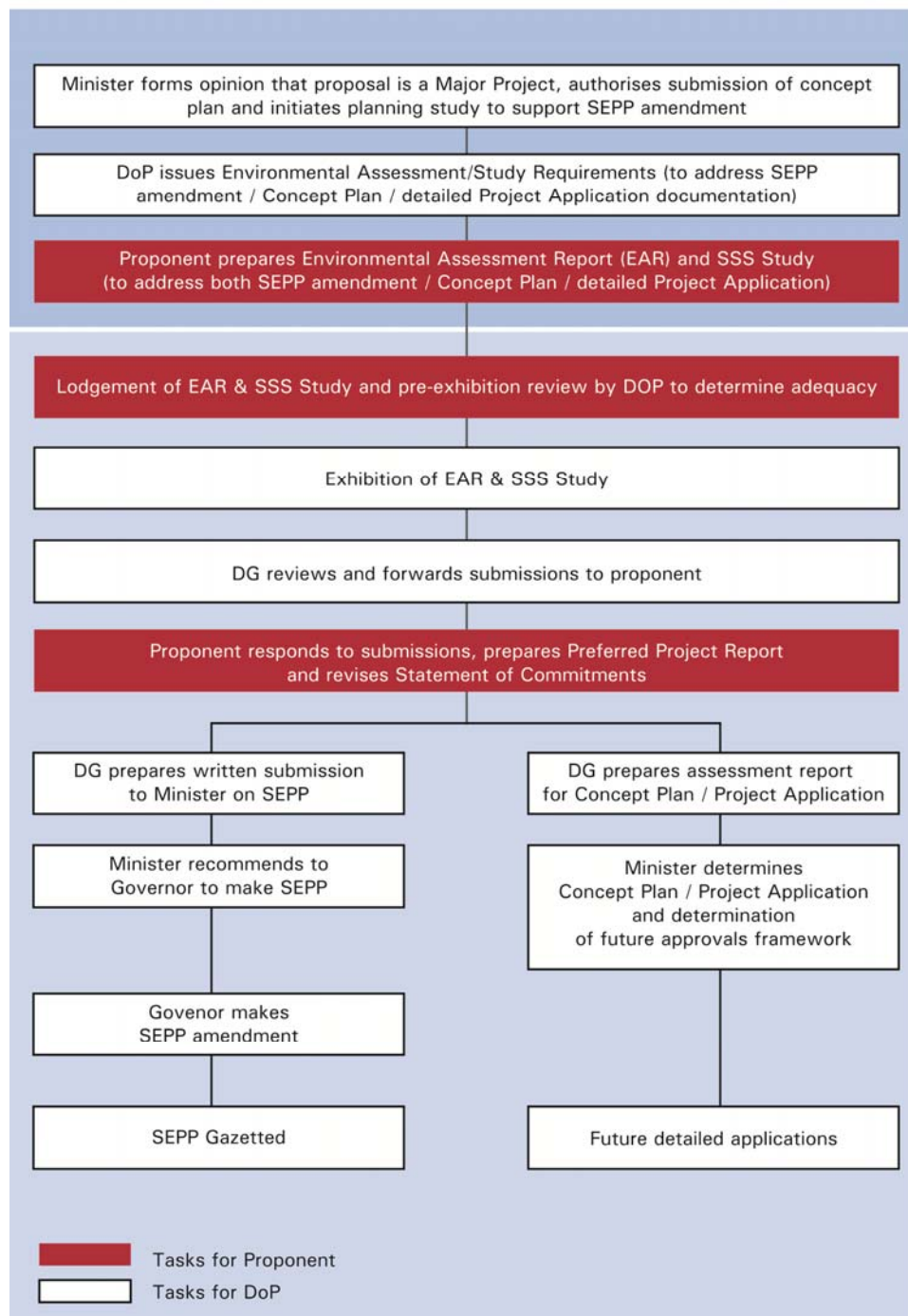


Figure 1 – Part 3A assessment and approvals process

1.4 Consultation

Consultation has been undertaken with the community, Councils and relevant Government agencies during the preparation of supporting technical studies investigations and the formulation of development proposals for the Project.

In accordance with the DGRs, the following public authorities, including all relevant utility providers, have been consulted:

- Department of Planning Strategic Assessments / Regional Office
- Department of Environment, Climate Change & Water
- Department of Industry and Investment (NSW Agriculture)
- Department of Education and Training
- Department of Health
- Department of Ageing Disability and Home Care
- Department of Community Services
- Department of Premier and Cabinet (Regional Coordinator)
- Shellharbour Council
- Wollongong Council
- Roads and Traffic Authority
- Ministry of Transport
- Lake Illawarra Authority
- NSW Rural Fire Service
- Sydney Water
- Integral Energy
- Jemena Gas Networks
- Telstra and other service providers
- NSW Police
- NSW Fire
- State Emergency Service
- Premier Illawarra Bus Co
- Department of Primary Industries

Authority	State Significant Site Study	DGRs	Strategic Planning	Urban Design Dev Controls	Transport and Access-ibility	Bio-diversity	Flooding	Water Courses Riparian	Drainage Storm Water	ESD and Climate Change	Heritage	Bushfire Risk	Utilities and Infra	Social and Community	Agri-cultural Land	Planning Agree-ments	Project Applic. Sub-div Works	Airport Noise	Employment	Economic	QS
Dept Planning (Assessment)																					
Shellharbour Council																					
Strategic Planning Justification																					
Urban Design and Dev Controls																					
Transport																					
Watercycle																					
Infrastructure and Utilities																					
Community Social and Open Space																					
Planning Agreement																					
Wollongong Council																					
RTA																					
Premier Illawarra Bus Co																					
Ministry of Transport																					
DECCW																					
Lake Illawarra Authority																					
Rural Fire Service																					
Dept. Primary Industries																					
Sydney Water																					
Integral																					
Jemena																					
Telecommunications Providers																					
Dept Education and Training																					
NSW Police																					
NSW Fire																					
Dept Health																					
DDAHC																					
Docs																					
Premier and Cabinet																					
State Emergency Service																					

Figure 2 – Consultation programme

Consultation was carried out by DLL with relevant stakeholders, including the community, between September and December 2009. **Figure 2** illustrates the consultation undertaken by the proponent. It shows which public agencies have been consulted, and the issue(s) of key relevance to that agency.

In addition, a Planning Focus Meeting was held by the Department of Planning in its regional office prior to issue of the DGRs. The Planning Focus Meeting involved a number of key agencies including the Department, DECCW, Wollongong and Shellharbour City Councils.

The outcome of all stakeholder meetings undertaken with public agencies is documented in the relevant technical studies included at **Volume 2**.

It is noted that the Department of Planning regional office also consulted with NSW Fire and NSW Police at the time of preparing the Director General's Requirements. Both authorities identified to the Department that they had no specific requirements to be considered and on this basis were not further consulted by DLL in the preparation of this proposal.

A number of formal consultation meetings have been held with both Wollongong (6) and Shellharbour (7) Councils. Consultation with both of the Councils is ongoing, in relation to a number of matters, including the proposed Voluntary Planning Agreements.

A Calderwood Urban Development Project - Community Consultation Outcomes Report – December 2009 detailing the community engagement strategy for the project and all consultations undertaken with the community is included at **Appendix D**.

In November 2009 DLL held a community information and feedback session at the Albion Park Community Hall. The session was managed and facilitated by Elton Consulting and attended by 83 residents and local business people / representatives of local organisations. At the session, a preliminary Concept Plan and supporting information was presented, including information on the planning that had been undertaken at that time for the site.

The issues raised by the community at the community information and feedback session, and subsequently via feedback forms are outlined in **Appendix D**. The development of the final Concept Plan proposal has been informed by the consultation and feedback provided by the community.

A Calderwood Urban Development Project website www.talkcalderwood.com.au is in operation.

Aboriginal consultation

Aboriginal community stakeholders have been consulted as part of the preparation of the Aboriginal archaeological and cultural heritage assessment. This included the Illawarra Local Aboriginal Land Council (ILALC) and the Wollongong Northern Districts Aboriginal Community (WNDAC).

Identification of Aboriginal community stakeholders was undertaken in accordance with the DECCW *Draft Community Consultation Requirements for Applicants 2005 (the Part 3A Guidelines) (DEC 2005b)*. This required notification of the relevant Local Aboriginal Land Council, the Registrar of Aboriginal Owners and Native Title Services (taken to mean the National Native Title Tribunal), as well as an invitation for Aboriginal stakeholders to register their interest in the project via public notices placed in the Illawarra Mercury and the Koori Mail. In addition, letters introducing the project were sent to the DECCW, Wollongong City Council and Shellharbour City Council.

2.0 Strategic Justification

Current strategic and economic circumstances are favourable to achieve immediate delivery of stock to market in the Illawarra. Changes in outlook arising from global, national and regional factors influencing investment and delivery certainty, including revisions to the development contributions regime in NSW, the scarcity of investor capital other than for well credentialed proponents and low interest rates have created a window of opportunity for the State government to ensure residential land supply benchmarks for the Illawarra are met.

This section:

- Provides the strategic justification for the Calderwood Urban Development Project; and
- Positions the Project as a site of significance to the State and region having regard to its National, State and regional planning policy context and social, economic and environmental features; and in terms of the need for alternative planning and consent requirements due to the involvement of more than one local council.

It demonstrates that:

- The project is sustainable in environmental, social and economic terms.
- The Project is consistent with the Illawarra Regional Strategy and meets each of the Sustainability Criteria set out at Appendix 1 of that Strategy.
- The Project can underpin the supply of residential land in the Illawarra without undermining implementation of the WDRA.
- The Project is supported by a viable implementation strategy that will leverage ready access to existing infrastructure capacity, provide structural enhancement to the regional infrastructure base and deliver savings and efficiencies in Government infrastructure expenditure.
- The project can be delivered and serviced independently of the WDRA.
- The site has a high ratio of urban to non urban capable land. It is relatively free of major physical and environmental constraints and is suitable for the land uses proposed. It is compatible with surrounding existing and future land uses and is satisfactory with respect to management of environmental constraints.
- Urban development represents the most viable and effective future use of the land.
- The Project has significant public benefit and is in the public interest having regard to its conservation outcomes, social and community benefits, contribution to local and regional economic growth and job creation and sustainability measures.
- There are compelling reasons for proceeding with the Project now to deliver housing product in the Illawarra that meets the market's ability to pay.
- The relevant criteria to support the nomination of the Project site on Schedule 3 of the Major Development SEPP are met.

The following sections draw upon the detailed site analysis documented in Section 2, particularly with respect to the implications of the site's regional land use planning context and its urban land capability.

2.1 Housing Affordability

Australia faces a national housing affordability and supply crisis. There is predicted to be a shortfall of more than 200,000 homes in Australia by 2013 and more than 1 million Australian families are in housing stress. This number is expected to grow in the short to medium term.

Recent pronouncements by all levels of Government agree that the contributing causes of the housing affordability crisis are inadequate housing supply in the market, complex planning systems and high infrastructure levies.

All levels of Government have developed policy framework to address housing affordability across Australia.

Housing is a reform priority of COAG which has identified housing affordability as a *“pressing issue for Australians”*.

The *NSW State Plan* (Priority Item E6) articulates the State’s response to housing affordability: it acknowledges that one of the levers affecting affordability is housing supply and recognises that there is a need to ensure there is competitive tension in the supply of land so that there is a continuing flow of new properties into the market.

The *NSW State Plan* provides a commitment to streamline the planning approval process to make it easier to deliver affordable housing by increasing the availability of zoned lots so that there is enough land for future supply when needed. It also commits to promote expanded supply of land for housing in existing urban areas via local targets for each LGA; and to deliver housing growth around regional centres to ensure access to infrastructure services.

There is a significant shortage of housing production across NSW, housing production in NSW has dramatically fallen since 2003 and Greenfield land supply has been at record lows for five years. It now accounts for only 10% of all new dwellings even given the Government’s own policy requirement of 30-35 (UDIA State of the Land Report 2009).

Within the Illawarra Region key issues include an undersupply of housing relative to anticipated demand; housing stress and housing affordability concerns (particularly for low to moderate income households); and a lack of diversity in housing stock to meet the needs of a changing and ageing population.

Recent analysis undertaken by the *Department of Housing* (2009) shows that Shellharbour LGA has a high number of residents in housing stress. Vacancy rates are low, rents are rising, demand is increasing and the number of people in housing stress is increasing. There is a significant lack of affordable housing for purchase for low and moderate income earners, and there is an immediate need to identify an alternative source of land supply to satisfy housing demand and control housing prices.

The IRS notes that *“Housing stress is a continuing problem in the region and has now reached the point where many local residents are being excluded from participating in the housing market...”*. It anticipates that housing stress and housing affordability will be improved through increasing supply to satisfy demand, and by delivering housing products that meet the market’s ability to pay.

The housing and land supply and affordability policy framework for the Calderwood Urban Development Project is detailed in the Illawarra Land and Housing Supply Report prepared by DLL included at **Appendix E** and summarised at **Table 2**.

Table 2 – Strategic Planning Context: Housing Supply & Affordability
(Source: Illawarra Land and Housing Supply, Delfin Lend Lease, 2010)

National Policy Agenda	
<i>The National policy agenda focuses on implementing funding programs to address housing affordability across Australia</i>	<ul style="list-style-type: none"> ▪ Recognises that housing affordability and delivery are significant issues affecting all major cities and regions across Australia ▪ Government has made commitments to increase land supply, reduce the cost and improve the delivery of urban infrastructure and improve the efficiency of planning and development approval processes ▪ Implementation of initiatives and funding programs to deliver affordable housing
NSW Government Initiatives and Plans	
<i>The NSW State Plan states its objective to encourage long term private investment as the principal source of growth in the development of new affordable housing stock</i>	<ul style="list-style-type: none"> ▪ The State Plan reinforces the need to encourage long term private investment as the principal source of growth in the development of new affordable housing stock. There is a need to ensure that there is competitive tension in the supply of land to ensure a continuing flow of new properties into the market ▪ The State Plan (2009) targets supply of at least 300,000 new dwellings over the next 25 years in regional areas. The Illawarra will accommodate approximately 13% of the State's target ▪ Introduced development contributions reform to reduce State infrastructure contributions, defer the timing of the payment, limit the amount local government can levy on new developments for infrastructure and the cessation of water infrastructure charges imposed by Sydney Water and Hunter Water
Regional Position	
<i>To date the Illawarra Regional Strategy has not delivered sufficient Greenfield source to meet the housing supply target of 38,000 in the yearsto 2031</i>	<ul style="list-style-type: none"> ▪ The Illawarra needs at least 38,000 new dwellings in the next 25 years to meet the ongoing housing demand for 47,600 new residents ▪ Population growth in 2008 has exceeded the 2006 projections ▪ The Illawarra Regional Strategy has nominated the West Dapto Release Area as the priority Greenfield site to accommodate the majority of the Region's growth – at the time of writing, the Release Area continues to suffer extensive implementation delays ▪ There is a lack of alternative Greenfield source to meet housing demand in the Illawarra market. The Strategy does not provide for competitive tension for the Illawarra land supply market
Local Response	
<i>There is a lack of policy response in the Shellharbour strategic documents to address housing affordability</i>	<ul style="list-style-type: none"> ▪ A large number of Shellharbour residents are experiencing housing stress ▪ There is a significant lack of affordable housing for purchase for low and moderate income earners. Purchase affordability is tight in Shellharbour and is rapidly growing ▪ Limited policy response under the Strategic Plan and Social Plan to improve housing affordability in the LGA
Illawarra Land and Housing Demand and Supply Status	
<i>Based on the land supply program provided in the Illawarra Regional Strategy, housing shortage can reach more than 8,000 by 2031</i>	<ul style="list-style-type: none"> ▪ Housing supply in the Illawarra is severely restricted because of the limited number of release area identified in the Regional Strategy. The Growth Centres Commission report recommended deferral of parts of the West Dapto Release Area. This imposes further uncertainty on the ability of the WDRA to meet land supply requirements ▪ Based on the latest information available, the Illawarra can experience a cumulative housing shortage of more than 8,000 homes by 2031. There is an immediate need to identify an alternative source of land supply to satisfy housing demand and moderate housing prices.

The socio economic profile on the Shellharbour LGA demonstrates why housing affordability is an issue that impacts the future of the area:

- Median income is lower than the NSW average;
- Mortgage payments are generally lower than the NSW average;
- A relatively young community compared with the average NSW age profile;
- A relatively high level of community stability – people generally remain in the area;
- Lower levels of tertiary qualifications;
- Economy in a period of transition from the dominance of heavy manufacturing businesses;
- An ageing workforce; and
- A relatively fluid young workforce (25 to 35 age group) with a high turnover.

In this context a significant component of new housing in Shellharbour must be targeted at entry level product with amenity and infrastructure that is in the financial reach of the 25 to 34 year old demographic, particularly those who will be required to staff and deliver new employment trends.

The housing affordability dilemma requires responses that deliver housing product that meets the market's ability to pay.

The Calderwood Urban Development Project will deliver a range of housing products to maximise diversity, affordability and choices at the lower and median end of the market. Housing products will be designed to suit the requirements of the households and match the ability of the market to pay. These will be delivered in a master planned community, which will ensure the quality of the housing products is maintained.

It will provide land supply and assist in creating competitive tension in the market place.

Figure 3 illustrates some of the housing options required to meet the identified market and the housing products that will be delivered as part of the Calderwood Urban Development Project.

Delivery of this diversity of product relies on scale through master planned communities and innovation through product development.








Shellharbour LGA	Maximum Repayment Per Week Without Entering Housing Stress	Housing Options
Moderate Income \$65,200	\$376	<div>  </div> <div>\$275K</div> <div>3 bed + study Terrace</div>
Maximum Loan \$245K		<div>  </div> <div>\$275K</div> <div>3 bed Concept 150 2 bed + study Axis</div>
		<div>  </div> <div>\$257K</div> <div>2 bed Concept 150</div>
		<div>  </div> <div>\$252K</div> <div>2 bed Gallery</div>
		<div>  </div> <div>\$252K</div> <div>2 bed Adaptus</div>
Low to Moderate Income \$54,300	\$313	<div>  </div> <div>\$215K</div> <div>1 bed Gallery</div>
Maximum Loan \$200K		<div>  </div> <div>\$215K</div> <div>1 1/2 bed Adaptus</div>
		<div>  </div> <div>\$210</div> <div>1 bed + study Studio 51</div>
<p>Note: Indicative prices subject to overall yield in masterplanned community project. Income levels quoted are based on 2006 Census adjusted for AWE index to February 2009. Assume 25 year mortgage period at current interest rates.</p>		

Figure 3 – Housing affordability (Source: Illawarra Land & Housing Supply, Delfin Lend Lease, 2010)

2.2 Residential Land Supply

2.2.1 Metropolitan Development Program

Calderwood is identified as an investigation area in the 2007/08 Metropolitan Development Program (MDP). It is one of two supply sources of scale, along with West Dapto.

The Metropolitan Development Program (MDP) is the program implemented by the NSW Department of Planning to manage land and housing supply and coordinate infrastructure delivery. The annual MDP report includes an assessment of land supply and dwelling production and provides short, medium and long term dwelling production forecasts.

The latest MDP 2007/08 Report provides the following land supply data for the Illawarra region:

Table 3 – MDP Land Supply Data (2007 data)
(Source: Department of Planning (2009) MDP 2007/08 Report)

LGA	Zoned and Serviced	Zoned and not serviced	Not Zoned and Not Serviced	Total Potential
Kiama	113	150	750	1,013
Shellharbour	4,332	0	8,700	13,032
Wollongong	685	0	20,650	21,335
Illawarra Total	5,130	150	30,100	35,380

2.2.2 Illawarra Regional Strategy 2007

The IRS, which incorporates the Kiama, Shellharbour and Wollongong LGAs, is the agreed NSW Government position to guide sustainable growth and economic development within the Illawarra for the period 2006 - 2031. Implementation of the IRS is underpinned on a whole of government basis through the Action Plans outlined in the NSW State Plan.

Relevantly, the Strategy aims to:

- Ensure an adequate supply of land strategically located to support economic growth and the capacity for an additional 30,000 new jobs by building on the current strengths in the existing manufacturing sector and the export opportunities presented by the port of Port Kembla.
- Provide 38,000 new dwellings by 2031 to accommodate an additional 47,000 people expected in the Region over the next 25 years.
- Ensure that 50% of new dwellings are provided in the form of detached housing, achieved as a priority through existing land release areas and the delivery of the West Dapto release area.
- Increase densities and revitalise areas around major centres and towns to provide housing choice in accessible locations, and to support economic growth.
- Provide for an additional new release area for Calderwood if demand for additional housing supply arises because growth in the Region is beyond projections and the ability of identified developments to satisfy housing demand.

Taking into consideration changing household needs brought about by an ageing population, a decline in families with children and an increase in singles and childless couples, an appropriate mix for new dwellings is identified in the IRS as:

- 19,400 detached housing;
- 14,800 medium density terraces and villas (including housing for the aged); and
- 3,800 high density units and apartments.

Meeting the IRS dwelling targets will require the delivery of over 1,500 dwellings per annum. The IRS estimates approximately 760 dwelling per year are required to be delivered through the development of future land release areas. The Illawarra UDP estimates the figure at 780 per annum.

The IRS estimates that, allowing for the staged release of West Dapto, existing and planned urban areas within the Region can supply approximately 42,000 dwellings over the next 25 years and beyond.

However, the identified capacity for housing supply documented in the Strategy is only 33,050 dwellings, including all existing zoned and serviced land, new release areas and the WDRA.

Table 4 – Current capacity for housing in the Region (source: Illawarra Regional Strategy p.20)

	Detached	Medium density	High density	Total
West Dapto Release Area	8250	2750	-	11 000
Current new release areas	5300	1250	-	6550
Zoned vacant infill land	4600	300	-	4900
Redevelopment	3500	3750	3900	11 200
Total	21 700	8050	3900	33 650

The IRS identifies the WDRA as the priority new release area to address the regional housing needs of the Illawarra and relies upon West Dapto delivering a steady annual lot production of 500 dwellings by 2009, after a ramp up of 150 dwellings in 2007 and 350 dwellings in 2008.

The Strategy acknowledges that the achievement of the required annual lot production of 500 lots will necessitate multiple development fronts to occur in West Dapto.

The IRS assumes that by 2010 other proposed release areas identified under the Strategy, including West Dapto, would be in production at a considerable scale – this has not occurred.

DLL has undertaken a detailed review and update of the housing and lands supply gap in the Illawarra region against the Regional Strategy target. The findings of this review are presented in the Illawarra Land and Housing Supply Report included at **Appendix E** and summarised below.

2.2.3 Illawarra population growth status update

Various sources of population growth data and analysis have been examined as part of the review and update.

The IRS provides the following growth data:

- As at 2006, the IRS reported an estimated 281,000 people living in the Illawarra. The projected growth to 2031 was 328,600 people, which represented an additional 47,600 people between 2006 – 2031 and an average annual growth rate of 0.7% or 1,904 people per year.
- The IRS determined that for this population growth, 38,000 new dwellings will be needed in the years to 2031.

The **NSW Household and Dwelling Projections 2006 – 2036 (Oct 2008 Release)** published by Department of Planning identified the following population growth rates for the Illawarra:

- The population of the Illawarra region was projected to increase by 61,000 persons from 278,000 in 2006 to 339,000 in 2036. This represents a 0.7% average annual growth rate.
- It was estimated that the projected growth rates would decline, falling from 0.78% in 2006-07 to 0.5% by 2035-36.
- Average household size is projected to decline from 2.52 persons per household in 2006 to 2.32 by 2036.
- Housing demand was expected to increase from 110,100 dwellings in 2006 to 145,200 dwellings by 2036.

The former **Growth Centres Commission (GCC) Report on the Proposed WDRA (Nov 2008)** reviewed the demographic projections and demand for dwelling types within the regional context:

- GCC suggested that the recent population growth across the region was below the long term average of 0.8% or 2,223 persons per annum. Accordingly it considered that DoP's 2004 projection adopted in the IRS as optimal (1,808 persons or 0.6% per annum on average to 2031).
- The appropriate mix of dwellings to meet the demand in West Dapto was considered to be 75% of separate houses and 25% of medium to high density dwellings.

The **2009 Illawarra Regional Strategy Update** published by the Department of Planning in 2009 provides the following data:

- The region has grown by an additional 6,200 people between 2006 and 2008. This represents an average annual growth rate of 1.1% per year.
- The growth rate is significantly above (i.e. 60% higher) the regional strategy's forecast projection of 0.7% average annual growth rate.
- The growth rate is also significantly above the GCC estimate of 0.6% used in the 2008 review.

Available population data and projections are summarised in **Table 5**.

Table 5 – Population growth data

Source	Population				Average annual growth rate
	2006	2031	Change No.	%	Years to 2031 %
IRS 2006	281,000	328,600	47,600	17	0.7%
<i>IRS 2009 Update*</i>	<i>278,000</i>	<i>284,200 (to 2008)</i>	<i>6,200</i>	<i>2.2</i>	<i>1.1%</i>
DoP 2008 Projection	278,000	326,650#	48,650	19	0.8%
GCC Dec 2008	277,840	323,040	45,200	16	0.6%

* The IRS 2009 Review does not contain population/dwellings projections. It only updated the latest population/dwelling data. In 2008, there were 284,200 people, which represented a growth of 3,200 since 2006. This represents an average annual growth rate of 1.1% which is significantly higher than the IRS projection of 0.7%. It should also be noted that the IRS 2007 and IRS 2008 used different population base data for 2006 - 281,000 and 278,000 respectively. If the annual growth rate of 1.1% continues, the population will reach 349,500 by 2031, way beyond the initial projection suggested in the 2006 IRS.

The DoP projections were up to 2036. The figure shown here is an estimate of population by 2031, based on the growth rates provided in the DoP projections.

2.2.4 Illawarra land supply status update / West Dapto Release Area

The Illawarra UDP identifies that:

*“Over the last 10 years, Greenfield lot production figures for the Illawarra delivered an average of approximately 620 lots per year, peaking at nearly 900 lots in 2001/2002 (Figure 4). The Regional Strategy **highlights the need to deliver approximately 780 lots (dwellings) throughout the region annually, predominantly through new release areas.** Given the status of the existing release areas in the region..., **an additional major release area needs to be brought on line by 2010** to avoid a regional housing shortage, particularly for detached housing”. (Our emphasis)*

Based on progress to date, and ongoing implementation difficulties, production from the WDRA at levels required in the IRS is unlikely to occur in the near future and possibly for a number of years.

On 15th May 2008 Wollongong Council Administrators announced that significant issues had been identified in the proposed WDRA planning documents, and that the former NSW Growth Centres Commission (GCC) had been asked to assist to resolve these. The GCC was requested by Council to undertake a review of the draft documents, including the draft Local Environmental Study, draft LEP and draft Section 94 Contributions Plan. The review also examined the draft Regional Infrastructure Delivery Plan.

The GCC concluded that forecast housing land supply in the IRS cannot be delivered as expected through the WDRA due to implementation difficulties with the Release Area arising from physical land constraints including flooding and riparian corridors.

The overall anticipated dwelling yield of WDRA has been reduced by approximately 15% from 19,000 to 16,000 dwellings, with only the first two stages of the Release Area likely to proceed in the near future, at reduced levels of annual production.

Whilst the IRS assumes that land supply to market will occur from the WDRA starting in 2007, and a lot production rate of 500 dwellings per annum by 2009 (after a ramp up of 150 dwellings in 2007 and 350 in 2008) this has not occurred.

The release of Stages 3, 4, East Horsley and Yallah Marshall Mount have been deferred until further studies and a revised Structure Plan are prepared to address flooding, infrastructure, access and vegetation constraints affecting these areas.

Revised estimates contained within the 2008 Growth Centres Commission Review of the WDRA suggest that a lot production rate of 300 dwellings per annum from the WDRA by 2015 is more likely, ramping up from a supply commencement of 100 dwellings in 2010.

However, at the time of writing the WDRA has not been rezoned, the Section 94 contributions plans to fund infrastructure have not been publicly exhibited, and no lots have yet been delivered to market from the release area.

Wollongong City Council adopted the findings of the GCC in December 2009.

On 12 February 2010 the State government announced the following Greenfields housing supply benchmarks for the Illawarra:

- 15 years supply (about 11,400 dwellings) in the IRS – this represents an annual supply of 760 dwellings;
- 8 years supply (about 6,080 dwellings) of zoned land; and
- 7.3 years' supply of serviced land (about 5,548 dwellings) which can be connected to trunk water, sewer and power infrastructure.

Existing zoned and serviced land has been estimated at 5,457 lots, and an estimated delivery of 6,600 lots from Stages 1 and 2 of the WDRA is anticipated.

As part of the announcement, the Minister for the Illawarra stated that whilst continuing to work to rezone the first stages of the WDRA, the State government is continuing to investigate other appropriate release areas.

Whilst in gross terms the delivery of a potential 6,600 lots from the WDRA area, combined with the existing estimated 5,457 zoned and serviced lots appears to meet the 11,400 supply benchmark, it does not take into account two matters that are critical with respect to capacity to deliver housing stock to market:

- Commencement dates for each release area / development;
- Annual lot product rates for each release area / development;
- The need to satisfy the full range of housing demand and meet the market's capacity to pay; and
- Implementation and delivery constraints of the various projects, including the market's expectations of what is to be delivered.

As identified at Section 2.2.5 below, irrespective of the WDRA, other planned developments in the Illawarra are not considered to appropriately satisfy all of the above matters. Specifically:

- Tullimbar and Shellcove are catering to a specialised market that is not meeting market;
- Shellcove ongoing production relies on commencement of the marine, and has predominantly medium density housing remaining, and therefore won't provide further significant detached housing supply;
- WDRA production commencement is delayed whilst the planning framework (including LEP and Section 94 Plan) is finalised.

Table 6 below provides a summary of anticipated lot yield and production scenario for existing and new Greenfield land release areas in the Illawarra based on the most up to date data available at the time of writing.

Table 6 assumes an annual lot production commencing from the WDRA in 2010 and reaching an average of 300 dwellings by 2015, consistent with the GCC report. It is noted that the 2010 timeframe for commencement of production from the WDRA is now unlikely to be realised.

Cumulative housing shortage in the years to 2031 is demonstrated at **Table 7**.

Table 7 shows that the Illawarra is expected to experience a cumulative housing shortage of more than 8,000 homes by 2031. The assumed Greenfields dwelling requirement of 780 dwellings per year is consistent with the Illawarra UDP.

Tables 6 and 7 demonstrate clearly that the changed circumstances arising from the delay in the planning and implementation of the WDRA mean that residential land supply for the Illawarra will be unable to meet the demand identified in the IRS in the time frames required under the Strategy. This will place additional pressure on new release areas to deliver product speedily to market to meet long term demand.

There is an immediate need to identify an alternative source of land supply to satisfy housing demand and moderate housing prices.

The rates of residential lot production estimated under both the IRS and the Illawarra UDP have now not been realised as anticipated for a number of years.

There is a high risk that land supply will not satisfy the full range of housing demand in the Illawarra Region. Therefore, there is a need to release additional land to accommodate the predicted geographic housing supply requirements in the IRS.

Table 6 –Land supply (Source: Illawarra Land and Housing Supply, Delfin Lend Lease, 2010)

Location Release Area	Total	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26-FY31
Wollongong LGA																					
Horsley 1 & 2	32	10	10	12																	
Western Suburb	159	100	59																		
Haywards Bay	318	20	20	75	75	75	53														
Brooks Terrace	30	30																			
Redgum Figtree	247	15	15	20	35	35	35	35	35	22											
Lantara Estate Figtree	29	3	10	10	6																
Woonona	320	50	50	50	70	50	50														
WDRA					100	100	150	250	250	300	300	300	300	300	300	300	300	300	300	300	300 pa
Sub Total	8,375	228	164	167	286	260	288	285	285	322	300	300	300	300	300	300	300	300	300	300	300 pa
Shellharbour LGA																					
Albion Park South	26	6	10	10																	
Albion Park West	93	10	20	20	20	23															
Shellharbour City Centre	282	50		58	58	58	58														
Tullimbar	1,978	20	20	100	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	88	
Dunmore	184			46	46	46	46														
Lakeview	195	50	50	50	45																
Shellcove	1,135	195	195	195	100	100	100	100	100	50											
Sub Total	4,019	331	295	479	394	353	329	225	225	175	125	125	125	125	125	125	125	125	125	88	
Annual Supply	12,394	559	459	646	680	613	617	510	510	497	425	425	425	425	425	425	425	425	425	388	300pa

Table 7 – Cumulative housing shortfall (Source: Illawarra Land and Housing Supply, Delfin Lend Lease, 2010)

Location Release Area Total	FY07	FY08	FY09	FY10	FY11	F12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26- FY31
Annual Greenfield dwelling requirements	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780pa
Annual Supply (from Table 3)	559	459	646	680	613	617	510	510	497	425	425	425	425	425	425	425	425	425	388	300pa
Deficit	221	321	134	100	167	163	270	270	283	355	355	355	355	355	355	355	355	355	392	480pa
Cumulative deficit	221	542	676	776	943	1,106	1,376	1,646	1,929	2,284	2,639	2,994	3,349	3,704	4,059	4,414	4,769	5,124	5,516	8,396

2.2.5 Calderwood as an additional source of land supply for the Illawarra

Approximately 100 hectares of the site is located within the WDRA. The majority of the site is also located within the MDP boundary (refer to **Figure 12** at Section 3 below).

The regional land supply requirements identified in the IRS can not be delivered in the timeframe or numbers that were expected when the Regional Strategy was published 3 years ago. In the 3 years since the IRS was finalised, the WDRA has not commenced as expected. Even when implemented, it is likely to produce 15% less yield than anticipated at the time of the IRS.

Also, in the time since the IRS was prepared there have been well documented changes in outlook arising from global, national, and regional factors influencing investment and delivery certainty, housing supply and affordability, sustainability and employment and economic development.

In this context, the IRS specifically nominates the Calderwood Valley as a location for future urban development, and as a source of land supply if demand for additional housing supply arises because of growth beyond projections of the Strategy or regional lot supply is lower than expected:

“Calderwood, to the south of West Dapto, was identified under the Illawarra Urban Development Program as a potential development area. The area identified on the program has the potential for up to 8,000 dwellings, although a proposal is currently being investigated by a group of landholders for a potential rezoning of 4000- 5000 dwellings. Calderwood provides an opportunity for an additional new release area if demand for additional housing supply arises because population growth in the Region is beyond projections and the ability of identified development areas such as West Dapto to satisfy housing demand.” (Illawarra Regional Strategy p.22)

Calderwood is the only alternative site specifically identified for urban release in the IRS.

As demonstrated above, population growth has exceeded the projections of the IRS, and lot supply has been low than projected under the IRS.

Both of the criteria set out in the IRS as a trigger for consideration of Calderwood as an alternative release area have therefore been met.

Given the delays in lot production and the demonstrated shortfall in land supply in the Illawarra Region, the release of Calderwood for urban development now conforms with the IRS and the State Government’s policy of releasing land quickly to market.

It is consistent with the State government announcement on 12 February 2010 that whilst continuing to work on the rezoning of the first stages of the WDRA, it would also continue to investigate other appropriate release areas.

It is also consistent with the independent review of the WDRA undertaken by the Growth Centres Commission in 2008. Relevantly, the Growth Centres Commission Review states the following:

“The rate of land supply is a major consideration in the planning for any release area. The forecast land supply has major implications for the provision and programming of infrastructure.

The Illawarra land supply program sets a greenfield target of 775 dwellings per year – 500 from West Dapto and 275 from Shellharbour. Currently, the program envisages the West Dapto Release developing on its own at 500 dwellings per year until about 2022/23 at which time Calderwood would commence, adding 275 dwellings per year.

An alternative scenario would be for West Dapto to commence in the immediate term through Stages 1 and 2 as recommended in this report followed by a second front in the south (Yallah/Marshall Mount and Calderwood) in the short term (say 5 years). If this is the case, it is likely that an overall production rate of 600 dwellings per year may be achievable (compared to 500), with 300 lots produced in the north and 300 lots in the south.

In the context of the average land supply in the Illawarra region over the last 9 years of 817 greenfield dwellings per annum (with peaks of over 1,000 dwellings per annum) and the State Government’s policy to release as much land to the market as quickly as possible, the early release of Calderwood could be considered subject to ensuring timely delivery of local infrastructure in West Dapto. Such additional and early supply of land to the market may also have benefits for housing affordability putting a downward pressure on house prices. It is also recognised that developers will self-regulate the supply of land based on market conditions.”

The Calderwood Development Project can deliver 12% of the new dwellings target under the IRS.

Following a ramp up period, DLL expects to deliver approximately 225 lots annually from the Calderwood Urban Development Project.

The Calderwood Urban Development Project can underpin the supply of residential land in the Illawarra market and without undermining the currently forecasted lot production necessary to support the delivery of infrastructure and delivery for West Dapto. This is demonstrated by **Tables 6 and 7**.

The proposed WDRA is a 40 year plus venture involving substantial investment. The potential impact of the Calderwood Urban Development Project on the future implementation of West Dapto over this timeframe and against this background is limited by the overall yield of the Project. At 4,800 dwellings, the Project is only approximately 25% of the yield of the WDRA.

The Calderwood Urban Development Project may have some short term impact on other planned developments within the Illawarra Region that are identified in **Table 6**, but only if those other projects are in a position to proceed.

The potential impact of Calderwood on these is considered to be limited as outlined below:

- Tallawarra – Calderwood could be expected to take some market share from this proposal, however this project would be expected to more significantly affect the West Dapto Release Area given its proximity to that site. It is understood that the timing of production from Tallawarra is subject to progress with the Wollongong Council Comprehensive LEP and resolution of infrastructure and servicing requirements.

- Bulli Brickworks – Calderwood has no impact on this proposal which is situated in a different catchment and market segment.
- Shellharbour urban fringe – this is a small release area with limited production capacity; impact from Calderwood would be quite small.
- South Gerringong – Calderwood has no impact on this proposal which is situated in a different catchment and market segment.

The two Greenfield release areas currently in production that will still be trading in 2012, namely Tullimbar and Shell Cove, cater to a very different market. As result, the impact from Calderwood on Tullimbar and Shell Cove will be insignificant.

Development of Calderwood for urban purposes is consistent with, and complementary to, the uses in the adjoining township of Albion Park, the new suburb of Tullimbar and proposed development at West Dapto. Calderwood is an urban extension of these areas and, as a result, can assist in the efficient use of existing community infrastructure facilities and services during the initial years of development.

2.2.6 Illawarra Regional Strategy and Illawarra UDP Boundary

The relationship of the Calderwood Urban Development Project site to the UDP boundary is shown on **Figure 12** at Section 2 of this report.

As demonstrated by **Figure 12**, the majority of the site is included in the UDP boundary.

The Regional Strategy states that long term urban development program sites at west and north west Albion Park are not required to meet regional housing demand given their location, size, shape and constraints and are not proposed for inclusion in the new Illawarra Urban Development Programme. The Strategy further states that part of the north west Albion Park area may be considered for some development in conjunction with the future consideration of Calderwood.

The DLL Calderwood proposal consolidates a number of the areas identified and they form an important component of the proposal.

The justification for inclusion of these areas in the DLL proposal can be summarised as:

- In terms of location, the land is an extension of the existing urban footprint at Albion Park and Tullimbar, facilitates provision of access via the Illawarra Highway and provides ready access to utilities and services;
- Concerns expressed regarding size, shape and constraints are addressed by inclusion of the land within the DLL Master Planned Urban Community proposal; and
- As demonstrated in the DLL Justification Report, Preliminary Environmental Assessment and Environmental Assessment Report for the Concept Plan the land is urban capable and is contained within a proposal that meets the Sustainability Criteria detailed in the Regional Strategy.

2.2.7 Illawarra Regional Strategy Sustainability Criteria

The IRS provides for the consideration of new release areas outside those identified on the Regional Strategy map for proposals that can demonstrate compliance with the Sustainability Criteria included at Appendix 1 of the Strategy.

Consistency with the Sustainability Criteria is addressed in the table at **Appendix F**. As demonstrated at **Appendix F**, the Project meets each of the IRS Sustainability Criteria.

It is noted that each of the IRS Sustainability Criteria were also incorporated into the Terms of Reference issued by the Minister for Planning in 2007 relating to the preparation and submission of the Gateway Justification Report for the Calderwood Project.

2.3 Infrastructure Delivery and Independence from West Dapto

Existing infrastructure, services and facilities are not adequate to support the development of the Calderwood Urban Development Project site and a comprehensive range of new infrastructure and services will be required.

An Infrastructure, Services and Facilities Implementation and Delivery Proposal prepared by DLL is included at **Appendix G** and detailed at Section 4 of this report. The proposal includes an offer to enter into Voluntary Planning Agreements with State and local governments for the delivery of both regional and local physical and community infrastructure.

DLL has undertaken a significant amount of investigation into how the development can be serviced, and, based on its experience elsewhere, prepared an assessment of required infrastructure, including community facilities and services and open space and recreation needs.

There is a clear and viable infrastructure and servicing implementation strategy that leverages readily accessible existing infrastructure. Key infrastructure is located at the front door to the DLL controlled land.

While Calderwood can be implemented as a stand alone proposal, the DLL infrastructure and servicing strategy provides structural enhancements to the Region's infrastructure base and long term synergies with other proposed Release Areas.

The infrastructure and servicing strategy minimises implementation risk and cost to Government by utilising DLL expertise and delivery proposals.

Single developer control of consolidated land holdings with scale provides the opportunity for delivery as works in kind ensuring control over implementation and meeting community requirements in a timely manner.

The Project is uncomplicated: practical and achievable solutions are available for implementation of all aspects of the Project.

The Proposal demonstrates the advantages of delivery through single commercial control over substantial land holdings:

- A single point of responsibility for delivery and implementation;
- Efficient internal utilities distribution networks with good connectivity;

- Integrated transport and land use delivery;
- Co-ordinated landscape and open space places, public domain and urban design;
- Opportunity for innovative services delivery model for learning, including initiatives such as utilisation of spare capacity that presently exists in nearby local schools, sharing of facilities and co-location;
- Co-ordinated community/children's/health services delivered through a multi-purpose, flexible community centre; and
- Avoidance of need for co-ordination and management of multiple landowner monetary, in-kind and land contributions into infrastructure and service delivery outcomes.

Consequently, the proposal demonstrates that the following specific Regional Strategy Sustainability Criteria are met:

- Mechanisms to ensure utilities, transport, open space and communication are provided in a timely and efficient way;
- Provision of accessible transport options for efficient and sustainable travel between homes, jobs, services and recreation;
- Quality health, education, legal, recreational, cultural and community development and other Government services are accessible.

Cost to government

The provision of infrastructure is costed and economically feasible based on government methodology for determining infrastructure development contributions.

Treasury Guidelines indicate that additional cost to Government arises generally from inefficient public resource allocation. In the case of urban development, the cause is out of sequence development as determined by the State Plan, State Infrastructure Strategy and Metropolitan and Regional Strategies.

Consistent with the IRS, Calderwood should be viewed as a supplementary land supply source and additional cost to Government, if any, viewed in the 25 year timeframe of the Regional Strategy.

The DLL infrastructure strategy involves provision of new substantial infrastructure, facilities, services and open space areas – at DLL cost - to satisfy the needs of the future Calderwood community. Savings and efficiencies in Government expenditure in the planning and delivery of infrastructure can be delivered by:

- Integrated planning and control over delivery through consolidated land holdings; and
- Incorporating facilities for the broader release area in the DLL proposal.

Health, emergency and police facilities may require some initial duplication, delivery and augmentation earlier than programmed, noting that such services will require expansion as a result of population growth in the region, regardless of whether the development occurs in Calderwood or other release areas.

The following economic effects of the proposal that are expected to yield benefits and costs to the Shellharbour LGA and wider community:

- Diversification of local economic activity;
- Investment certainty;

- Increased demand for goods and services;
- Cost effectiveness and timely development; and
- Maximising the net benefits of land use;

Independence from West Dapto Release Area

The Utility Services Study prepared by Cardno has specifically examined the ability to provide utility services to the site in the context of the strategy for servicing the WDRA:

Calderwood and West Dapto represent the last remaining greenfields urban release areas of scale in the Illawarra. Whilst the projects will be virtually contiguous when fully developed, and the timing of the release of land in both areas is likely to overlap, their respective early stage releases (i.e initial development fronts) are more than 10km apart and will be supported by an entirely different services and delivery implementation mechanism.

Water supply is to be delivered to the WDRA from the Dapto and Wongawilli Reserves to the north. The capacity of the existing water infrastructure head works is adequate for servicing the early stages of the West Dapto release and its adjacent development areas. The Wongawilli reservoir can service the early stages of development up to approximately 10,000 dwellings. There would be a requirement for construction of a new reservoir along the feeder lines from Kembla Grange to service the latter stages of the development and / or development areas at the southern end of the release area.

Calderwood needs to be serviced initially from the existing Albion Park Reservoir in the south, or in the longer term from a future reservoir at Avondale (also in the South). The service areas for the Wongawilli and Avondale Reservoirs are quite separate and have been purposely sited by Sydney Water so as not to over supply areas and lead to inefficiencies.

In terms of sewer, both Wollongong and Shellharbour STPs have available treatment capacity for any early development (first 5 years) though will need to be amplified in order to accommodate the future growth of both Calderwood and West Dapto. Both these are separate augmentations and independent of each other. They have physically separate reticulation areas, and are managed separately by Sydney Water.

Integral Energy's strategy for West Dapto is again independent of the Agency's plans for Calderwood and involves the establishment of 3 new substations. The approximate locations of these substations have been determined based on the assumed centre of load as well as proximity to existing transmission lines and in consultation with the Council. Integral is currently unable to service any major development in West Dapto until it has made suitable arrangements with developers that enable the establishment of zone substations. Some limited capacity is available to service approximately 400 lots in West Horsley.

Some limited capacity is also available to service around 500 lots in Calderwood but then a new zone substation will be needed. A specific site for this is identified and delivered by the Project.

West Dapto is likely to be serviced with both reticulated water and sewer from the existing trunk infrastructure in the north. Similarly, a new zone substation is required in the north, preferably on land central to the load in Stages 1 and 2 of the WDRA.

Calderwood, on the other hand, is some 10km from the early stages of West Dapto and will be serviced to the south by an entirely different servicing strategy.

Calderwood can be developed independently of the WDRA and therefore will not affect the provision of infrastructure for West Dapto.

The Infrastructure servicing strategies for the WDRA and for Calderwood demonstrating the above conclusions are illustrated graphically at **Figure 38** included at Section 3 of this report.

2.4 Economic Growth, Employment and Retail Impact

2.4.1 Economic growth

An Economic Impact Analysis prepared by Pricewaterhouse Coopers is included at **Appendix H**. The Economic Impact Analysis supports both the SSS Study and Concept Plan.

The Economic Impact Analysis estimates the level of economic activity that will be generated by the project and assesses the contribution of the project to local employment, and the size and structure of the economy within which the project is proposed.

The Economic Impact Analysis is based on assessment of the social economic and demographic profile of the region and the local economy and incorporates input-output modelling undertaken by National Economics to quantify the economic impacts of the project.

The key outcomes of the Economic Impact Analysis are summarised as follows:

- The project will inject (directly) an estimated \$2.9 billion into the local economy during the construction period in the form of payments to goods and service providers;
- 'Leakages' or losses of these payment and jobs will be minimised by preferring the use of local construction inputs and labour where possible;
- Direct construction expenditures and expenditures by incoming residents will create an additional PV\$6.3 billion in net value for the Shellharbour Local Government Area (LGA) economy over the project period. Any cost to government should be viewed in the context of the size of the economic impacts and benefits;
- The local construction sector will enjoy a large proportion of the additional value created during the initial phases, while the services and retailing sectors become the main beneficiaries as residents move in;
- The Project will assist in maintaining existing employment positions, particularly in the construction sector, and create an additional 8000 full time equivalent positions, with around 5,260 of these located in the Shellharbour LGA. This yields a high job containment ratio of over 60% for the development;
- A significant market entry level housing component would help reduce housing stress and encourage economic activity by attracting and retaining a skilled and younger labour force and increasing disposable incomes of residents; and
- The increase in housing mix and affordability would generate a range of benefits to residents including but not limited to better access to employment, training and educational resources, while the community would also benefit through impacts such as improved local amenity.

2.4.2 Employment

The strategic planning context for the Calderwood Urban Development Project with respect to jobs growth and employment opportunities is detailed in the Calderwood Employment Update Revised Report January 2010 prepared by Strategic Economic Solutions (refer to **Appendix I**).

The Employment Update addresses:

- National directions in business formation and employment generation;
- Regional context of population, business and employment in the Illawarra; and
- Business and employment in Shellharbour over the next 20 years.

Updated population forecasts for Shellharbour suggest that the area will see substantial population growth, with less emphasis on older people than in previous forecasts, though the rate of growth of retirees is still expected to be above that of the working age population.

The implications are that:

- The larger working age population will require more locally-based jobs; and
- There are likely to be bottlenecks in services for aged residents and possibly also an extension of part-time work into retirement.

The Calderwood Urban Development Project includes 50 hectares of retail, education, community and mixed use / employment land. Together with appropriate investment in infrastructure this land caters for new employment directions.

The Project also supports the IRS for delivery of other employment land. The Calderwood infrastructure solution will support both the Regional Airport and Yallah employment lands which are required for the traditional employment base of the area.

Future business and employment growth in Shellharbour will need to become less dependent on the traditional base which delivers low employee per hectare rates in favour of a shift to businesses that are smaller and based on knowledge, skills and capital. The transition from a base of heavy manufacturing to a more diverse and future proof economic mix requires strategies to stimulate business formation, accelerate business attraction and enhance business sustainability. National business growth sectors are in Business Services, Health Services, Construction and Retail.

The Calderwood Urban Development Project will provide a balance of job creation through both a traditional base and new driver industries, supported by a range of initiatives for the facilitation of workforce skills development and business success and growth. The proposal will deliver fibre based technology to both the employment and urban lands, providing flexibility for residents and businesses to respond to the evolving nature of work in the future.

2.4.3 Retail impact

An Assessment of Retail Floorspace Potential prepared by Duane Location IQ is included at **Appendix J**. The Assessment presents an independent assessment of the potential for retail facilities within the development to support both the Concept Plan proposal and SSS Study.

The Assessment of Retail Floorspace Potential identifies that existing residents of the Calderwood Valley are currently served by retail and commercial facilities at Albion Park and within the Shellharbour Town Centre.

The major retail centre within the existing town centre, Stockland Shellharbour, has been approved for a major redevelopment that will include the addition of a Myer department store.

The trade area likely to be served by retail facilities within the proposed development defined by Duane Location IQ is illustrated at Section 2 of this report. Section 2 also identifies the existing and likely future competitive retail facilities to the project.

The overall trade area extends between 5 and 10 km from the site and is limited to the north and east by higher order retail facilities located within the Dapto and Shellharbour Town Centres. The trade area includes a primary sector and two secondary sectors as follows:

- The primary sector incorporates the site and the surrounding rural area 5km to the south and 9km to the west.
- The secondary north sector contains the Yallah Marshall Mount future residential area, which forms the southern extent of the West Dapto Release Area.
- The secondary east sector contains the Albion Park residential area.

Duane Location IQ have estimated that the population within the trade area is projected to increase to 33,950 persons by 2036, with an ultimate population of 42,500.

Total main trade area retail spending is currently estimated at \$164.2 million and is projected to increase to \$267.3 million by 2021 (a projected growth of 4.8%). The largest spending market is food and liquor.

Centro Albion Park is currently the only major retail facility located within the main trade area. The centre is anchored by a Woolworths of 3,200 sqm and is situated approximately 4km to the west of the site. Retail speciality space within the centre is relatively limited.

Not all of the trade area resident's demand would be catered for locally. Some spending would be directed to facilities at Dapto and Shellharbour, particularly non food spending. Over time, as the population in the main trade area increases, a greater range of retail facilities will be supportable in the main trade area and the level of escape spending should reduce.

Duane Location IQ concludes the following with respect to the supportable retail floor space for the proposed development :

- 85-95% of food provision should be provided locally within the site as future residents of the development should not have to travel outside of their local area for food shopping.
- Around 40% of non-food facilities should be provided within the site including convenience based facilities such as pharmacies, hairdressers, newsagents and the like, as well as basic apparel and homewares shopping. Higher order non food facilities will be catered for at Shellharbour and Dapto.
- The incoming resident population of the proposed development will demand a significant level of retail floorspace. Even using very conservative assumptions, this demand is likely to be at least 48,400 sqm of retail floor space once the ultimate population capacity is reached. Of the total 48,400 sqm, residents will require a minimum of 31,500 sqm of retail floor space (or 65%) to be provided within the site. This floor space demand excludes non-retail tenants such as banks, doctors, post office, real estate and the like.

This leaves 35%, or 16,900 sqm of retail floor space to be provided by higher order retail facilities beyond the trade centre such as Shellharbour.

- The majority of on site retail floor space (approximately 80%) should be accommodated in the proposed Town Centre, resulting in a Town Centre of a minimum 25,000 sqm in the longer term. The remaining on site retail floor space can be accommodated in local centres, distributed throughout the site to serve the top convenience needs of the immediate surrounding population.
- A full line discount department store (8,000 sqm) is unlikely to be supportable on the site as some of the non food spending will be directed to the larger centres of Shellharbour and Dapto. However, the site could support a small format discount department store of around 4,000 – 5,000 sqm once the area is fully developed. Any such store should be located within the Town Centre.
- To meet the demands of the future population, three new supermarkets should be incorporated into the development, with at least two full line supermarkets as well as a discount supermarket.
- Allowing for a minimum of 25,000 sqm to be designated for the new Town Centre, the following components should be provided:
 - A small discount department store of around 4,000 – 5,000 sq metres.
 - Two full line supermarkets and possibly a discount supermarket comprising around 9,000 – 10,000 sqm.
 - 3,000 – 4,000 sqm of mini major floorspace.
 - 50 – 60 speciality stores, or around 7,000 – 8,000 sqm of floor space.
 - Some limited freestanding facilities such as fast food and small bulky goods stores.
- The remaining 6,500 sq.m should spread between a number of smaller neighbourhood/local centres, located to serve the top-up food and grocery needs of:
 - the immediate surrounding population.

These recommendations have been reflected in the Concept Plan proposal. They are also reflected in the selection of land use zoning proposed for the new Town Centre and Village Centre.

The retail analysis demonstrates that the Project will not adversely impact upon other known or planned retail centres or developments.

Duane IQ Logical has concluded that the proposed retail floorspace within the Calderwood Urban Development Project will not impact the existing surrounding Shellharbour/Wollongong hierarchy, due to the following:

- The 22,000 residents are likely to support some 48,400 sq.m of retail floorspace. Only 65% of this floorspace is recommended to be retained within the site. The remaining 35% will be contained in centres beyond the trade area, boosting sales for the surrounding higher order retail facilities.
- Projected floorspace within the Calderwood Town Centre is smaller than floorspace currently provided in the surrounding centres. The ultimate retail component will be 2-3 times smaller than both the Shellharbour and Dapto centres, as well as other major centres in the wider surrounding area.
- The first stage will be a supermarket based centre with the final development of the Town Centre to its ultimate size over 25 years away.
- The proposed level of retail will help generate employment and business within the Calderwood area, improving self-containment in the Calderwood Urban Development Area and creating jobs for the future local community.

2.5 Alternative Land Uses

A detailed analysis of existing land uses on and in the vicinity of the site, and known future regional land use planning outcomes is provided at Section 3 of this report.

The Calderwood Release Area is located immediately north west of the existing urban footprint of Albion Park. It is also adjacent to existing utilities and services. The Calderwood proposal is both compatible with, and complementary to, surrounding and future land uses.

The obvious alternate use for the Calderwood Urban Development Project site is ongoing agricultural and hobby farm use consistent with its current zoning and land uses.

One of the aims of the *Illawarra Regional Strategy* is to “Promote the economic food and fibre production and community values of existing agricultural lands and protect them from inappropriate urban expansion (other than that identified under this Strategy or in accordance with the Sustainability Criteria)...” (p.36).

The Sustainability Criteria at Appendix 1 of the *Illawarra Strategy* require planning proposals to demonstrate “the most efficient / suitable use of land”, and to avoid “identified significant agricultural land” and “productive resource lands – extractive industries, mining and fishing.”

In addition, *Local Planning Directions 1.2* and *1.5*, which relate to the future of rural land, aim to protect the agricultural production value of rural land within NSW, and to facilitate the orderly and economic development of rural lands for rural and related purposes.

Before rezoning land from a rural zone to a residential, business, industrial, village or tourist zone, or when preparing a planning proposal that will affect land within an existing or proposed rural or environment protection zone, the ‘consistency’ provisions of the Directions require the relevant planning authority to be satisfied that the proposal is:

- Justified by a strategy / study that gives consideration to the protection of agricultural production value of rural land, or is
- In accordance with the relevant Regional Strategy.

State Environmental Planning Policy (Rural Lands) 2008 applies to land within the Shellharbour LGA. The SEPP aims to facilitate the orderly and economic use and development of rural lands for rural and related purposes and incorporates ‘Rural Planning Principles’ and ‘Rural Subdivision Principles’ that are required to be incorporated into local environmental planning proposals unless the Director General of the Department of Planning is satisfied with respect to the ‘consistency’ provisions. An Agricultural Land Study prepared by Sphere Property Corporation is included at **Appendix K**.

The Agricultural Land Study examines the productive resource and regional significance of the existing agricultural/rural activities occurring on lands both within and immediately adjoining the site, and assesses the efficiency, suitability and sustainability of continued agricultural / rural land use on the site. It also addresses the impact of the proposal on the primary production values and practices of adjoining rural areas, and the ‘regional significance’ of food production.

The Study supports the proposed rezoning and redevelopment of the site having regard to the site’s identification within the Strategy for potential future urban release, and the current and future agricultural capability of the land.

Analysis of land uses within the area of influence (refer to Section 3) demonstrates that:

- More than half of the existing rural land within the 'area of potential influence' of the Calderwood Project has been identified by the State government for future urban development.
- The majority of land adjoining the Calderwood site to the north, south and east comprises existing urban development, land identified for future urban release, or rural land already strongly influenced and physically contained by its proximity to the existing urban areas of Tullimbar and Albion Park.
- More than half of the land adjoining the Calderwood site to the west comprises land identified for future urban release, or conservation lands.
- The Calderwood site is, to a large extent, physically contained, and geographically isolated from surrounding productive agricultural lands.

Implementation of the IRS will fundamentally change the existing rural character of the majority of land surrounding the Calderwood site. The locality will undergo transformation from the existing rural and agricultural land uses to urban development. This intended transformation underpins growth in the Illawarra.

As identified as part of the site analysis at Section 3, the Calderwood site and land within the area of influence of the site does not support regionally significant areas of food production.

Currently only 30% of the total site area is used for productive agricultural use. Key existing uses on the site and in the locality are dairying, low intensity farming, agistment, hobby farms and lifestyle activities. Approximately 70% of rural land adjoining the site is used for hobby farming, life style, low intensity farming or other uses.

Land supporting regionally significant food production is located in the Kiama LGA to the south of the Calderwood site. This position is supported by the IRS which identifies (p.36) that *"agricultural lands in the south of the Region (Kiama, parts of Shellharbour and adjoining agricultural lands in the Shoalhaven) are strategically important for long term food production that is close to markets"*.

Although located in a 'rural and natural resource area' under the Strategy, the Calderwood site, which is identified for future housing and settlement under Chapter 6 of the Strategy, is not identified as significant agricultural land, nor as productive resource land (refer to Section 3). Nor is any of the land within the defined 'area of influence' or 'area of potential impact'.

Land currently zoned for rural purposes represents a significant component of the total land area of the Wollongong and Shellharbour LGA's. However, most of the existing rural area is designated for residential development under the IRS and the MDP. This reflects the economic reality that these two LGA's are no longer major agricultural areas.

The Shellharbour and Wollongong LGAs only contribute to approximately 8% of the total agricultural value of the region. Within the 'area of potential influence' and 'are of potential impact' of the Calderwood Project, land used for livestock activities represents only 0.04% of the total area of land in the region currently used for these activities.

The combination of the small scale agricultural production on the site and its surrounding area, and the distance of this area from the major regional agricultural areas means that the development is unlikely to have any measureable impact on the production from those areas.

Sphere Property Corporation conclude that there would be nil to minimal impact on primary production values and practices of adjoining areas due to the existing limited agricultural production in the locality.

Sphere Property Corporation also concludes that the development will have minimal impact on regionally significant areas of food production because the site does not currently support any livestock and crop production and is not located in or close to an area of regional agricultural significance.

Any impact it might have on the 0.04% of the region's land used for agricultural production in its 'area of potential influence' and 'area of potential impact' will be so low on a regional basis as to be imperceptible.

Sphere Property Corporation identify that any negligible impact that the development might have could be reduced in its immediate vicinity through appropriate urban design and the inclusion of a buffer area between the subject site and the adjoining affected agricultural land. It is noted that the Concept Plan achieves this.

It is also noted that as part of DLLs consultation with the Department of Agriculture, that Department requested that re-vegetation of the currently cleared flood plain areas of the site be minimised to the greatest extent practicable so as to retain potential opportunities for future agricultural uses (eg market gardens) to be provided on the site. The Concept Plan proposal accommodates this request.

2.6 Environmental Constraints and Benefits

The consolidated constraints mapping presented at **Figure 40** in Section 3 demonstrates that the land which is proposed to be developed under the Concept Plan is urban capable.

The site has a high ratio of urban capable to non urban capable land as is demonstrated by the site analysis documented at Section 3.

The constraints that do exist on site can be integrated, managed and/or conserved as part of the development proposal for Calderwood and strategies that reduce threatening processes are proposed.

This is comprehensively demonstrated by the Concept Plan, by the Site Analysis and by the Environmental Assessment documented at Section .

The Concept Plan and SEPP Amendment proposals present an holistic and integrated outcome having regard to riparian, flooding, biodiversity, landscape and open space and water cycle (drainage and stormwater).

Environmental impacts with respect to transport and accessibility, bushfire, contamination, land stability, acid sulphate soils, erosion, groundwater impacts, social and community impacts, utility servicing, and European and Indigenous heritage are demonstrated to be appropriately managed.

2.7 Sustainability

Delfin Lend Lease (DLL) is part of the Lend Lease Corporation (LLC). Both DLL and LLC have won numerous awards for environmental outlook and delivery. For full details, visit the Lend Lease website: <http://www.lendlease.com/> and follow the links to 'Lend Lease Sustainability'.

LLC is included in the "Global 100" list of the world's most sustainable corporations. Lend Lease is the only Australian company to be listed on all three of the 2008 Dow Jones Sustainability Index, the 2008 Goldman Sachs JB Were Climate Leadership Index and 2009 Global 100. A copy of the LLC Policy Statement on the Environment can be found at the following link: http://www.lendlease.com/sustainability/pdf/LendLease_Environment_policy.pdf

The Calderwood Urban Development Project demonstrates sustainability as follows:

- The Project delivers integrated planning and design that coordinates social, physical, transport and economic outcomes.
- It will deliver a range of densities, lot sizes and dwelling types and create a diverse community that is demographically balanced. The variety of housing forms will provide opportunities to respond to changing life cycle, lifestyle and work requirements over time, enabling people to age in place. It delivers key social sustainability outcomes.
- As a developer lead master planned community the Project can be delivered in a manner that achieves a relatively high level of self containment in terms of employment generation, retail expenditure and vehicle trip generation. This self containment will contribute positively to reducing the carbon footprint of the development as compared to traditional Greenfields residential development.
- A comprehensive package of deliverable sustainable transport measures is identified to assist in achieving a 10% mode shift away from private vehicle. Measures include timely provision of facilities and services, a diversity of land uses and housing types across the project, walkable access to key amenities and an holistic approach to the design of the street network, carefully balancing the needs for vehicle movement with the needs of pedestrians and cyclists.
- The Project will make a positive contribution to the achievement of travel and vehicle use goals in the Illawarra. It will form part of a larger urban area and assist in the achievement of a public transport catchment that can be serviced by economically efficient transport services.
- The Project makes special provision for home based businesses and working from home in accordance with the principles of the National broadband network. Combined with employment lands and a new Town Centre and Village centre, this will reduce car dependency and trip generation rates.
- The Project will generate approximately 8000 full time equivalent jobs by 2031, of which there will be a high containment ratio to the Shellharbour LGA – approximately 60%. This will contribute positively to a reduction in trip generation and to minimising the carbon footprint of the development.
- The Project retains core biodiversity areas within the site and incorporates both east west and north south habitat connectivity. It presents a long term ownership and management regime for the protection of natural resources.
- The proposed infrastructure and servicing strategy provides for structural enhancements to the region's infrastructure base and long term synergies with other proposed release areas.

It will deliver efficiencies and economies of scale in infrastructure delivery and thus improve the sustainability of regional infrastructure to support future urban growth within the wider region.

- The Project adopts flood plain management and water sensitive urban design measures and design features that respond to an analysis of potential climate change impacts. The large size of the site and its availability for coordinated development enable the delivery of an holistic flood plain mitigation plan accompanied by water sensitive urban design measures that will result in a net improvement in water quality in Marshall Mount Creek, Macquarie Rivulet and as a consequence Lake Illawarra. Water cycle management integrates with urban design, salinity risk and riparian corridor protection measures.
- DLL is committed to the development of alternative technologies in its communities. The issues of carbon emissions, renewable energy targets and land tenure solutions will become increasingly relevant to new urban developments. DLL sees potential for both solar farms and co (or tri) generation as part of the Project, particularly for the Town Centre and employment precincts. Such opportunities will continue to be considered throughout the project.
- Energy sustainability for the Project focuses on reducing the demand for energy through the efficient design of the urban form to capitalise on the natural features of the site. Demand will also be mitigated through consumer demand initiatives including BASIX requirements for dwelling design.
- The Project adopts potable water supply conservation targets and identifies sustainable integrated options for water supply, wastewater and stormwater servicing. The master planned residential and non residential layout lends itself to an efficient internal water distribution network with good connectivity and relatively minor hydraulic losses.

3.0 Site Analysis

3.1 Site Location

The Calderwood Urban Development Project site is located in the Shellharbour and Wollongong Local Government Areas, within the Illawarra Region. The site comprises approximately 700 hectares of land of which approximately 107 hectares is located in the Wollongong LGA and the balance is located within the Shellharbour LGA. The regional context of the site and the LGA boundary is illustrated by **Figure 4**, which also shows the LGA boundary.

3.2 Land Ownership and Legal Description

The land to which the SSS Study and Concept Plan applies and ownership is shown on **Figure 5** and in **Table 8** with full title description.

The SSS and Concept Plan site is comprised of 22 existing lots in private ownership.

The SSS and Concept Plan site also includes Macquarie Rivulet, which is Crown Land, and the public road reservations of Calderwood Road and North Macquarie Road which are owned by Shellharbour Council. Marshall Mount Creek is in various ownership, partly incorporated into existing lots that adjoin or straddle the riparian corridor.

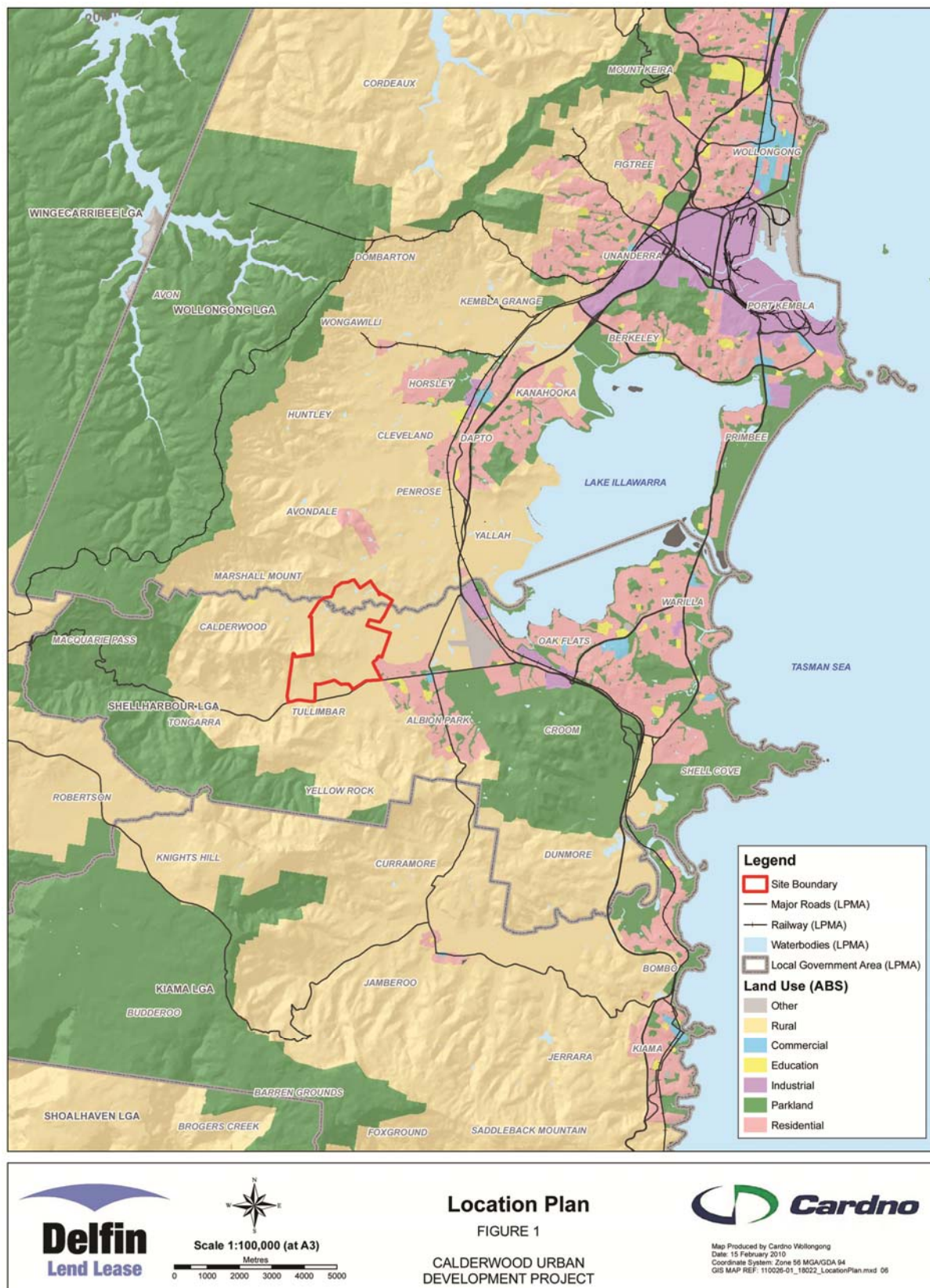


Figure 4 – Site location– regional context

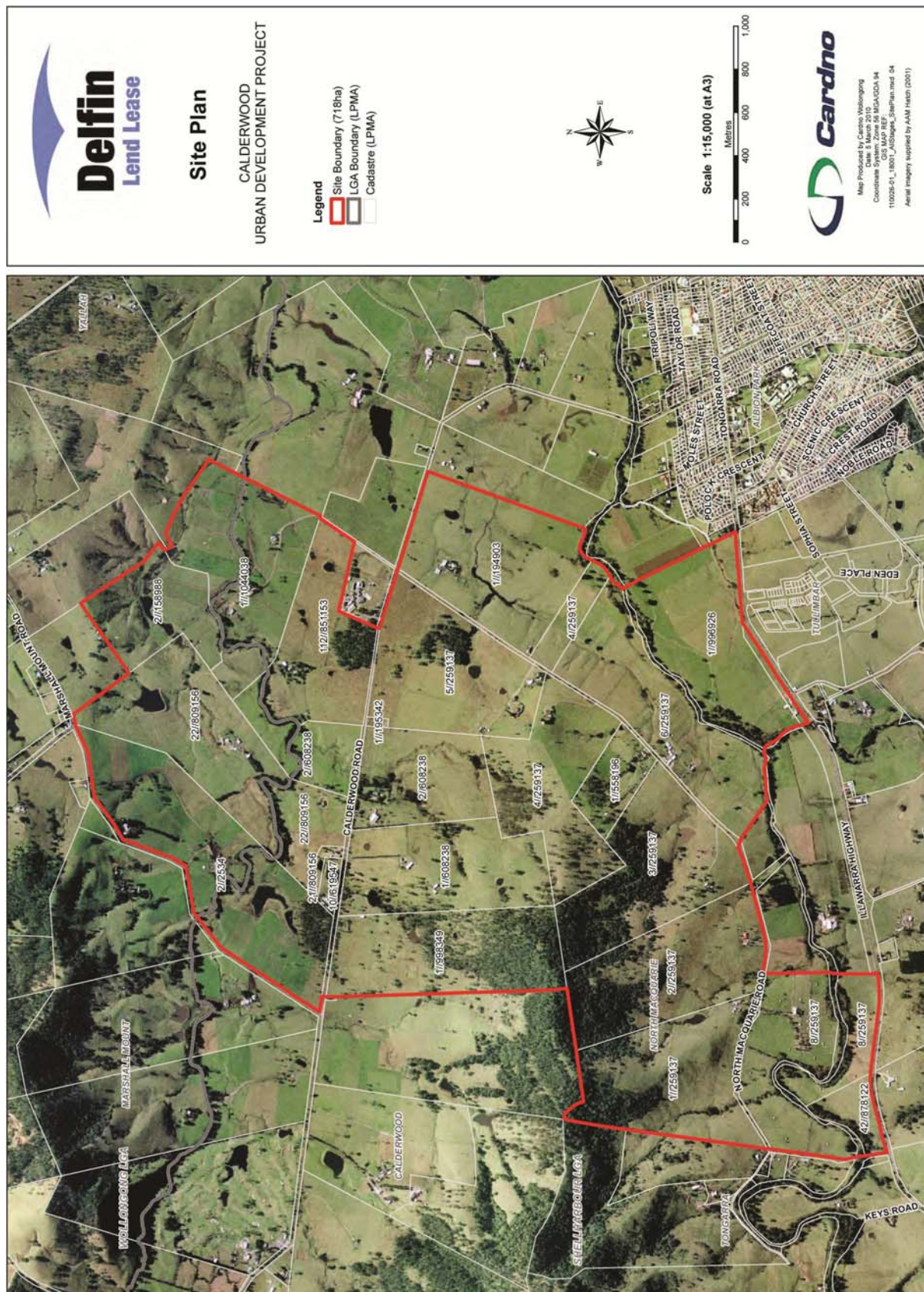


Figure 5 – Land ownership

Table 8 – Landownership and legal description

Property	Legal Description	Existing land use
299 North Macquarie Road, North Macquarie	Lot 4 in DP 259137	Low intensity farming
317 Calderwood Rd, Calderwood	Lot 2 in DP 608238	Low intensity farming
337 North Macquarie Road Calderwood 25	Lot 5 in DP 259137	Low intensity farming
"Meadow Wood", 379 Calderwood Road, Calderwood	Lot 1 in DP 998349	Low intensity farming
"Riversdale" North Macquarie Road, Calderwood	Lot 1 in DP 1044038	Dairy
"Parkview", 24 Yellow Roack Road, Yellow Rock	Lot 1 in DP 194903	Dairy
"Marshall Mount House", Marshall Mount Road, Albion Park	Lot 2 in DP 2534	Low intensity farming (incorporates part of Marshall Mount Creek)
221 North Macquarie Road, Calderwood	Lot 3 in DP 259137	Agistment
"Cleddau", 129 North Macquarie Road, North Macquarie	Lot 1 in DP 259137	Agistment
"Calderwood Farm" 320 Calderwood Road, Calderwood	Lot 22 in DP 809156 and Lot 112 in DP 851153	Horse stud
159 North Macquarie Road, North Macquarie	Lot 2 in DP 259137	Low intensity farming
Calderwood Road, Calderwood	Lot 1 in DP 608238	Low intensity farming
"Brushgrove", 248 North Macquarie Road, North Macquarie	Lot 6 in DP 259137	Agistment
342 Calderwood Road, Calderwood	Lot 21 in DP 809156	Other
368 Calderwood Road, Calderwood	Lot 10 in DP 619547	Other
Illawarra Highway, Calderwood	Lot 1 in DP 996926	Dairy
440 North Macquarie Rd, Calderwood	Lot 2 DP 158988	Dairy
128 North Macquarie Rd, Calderwood Valley	Lot 8 DP 259137	Horse Stud
	Lot 42 DP 878122	Hobby farm
Marshall Mount Methodist Cemetery	Lot 1 DP 195342	Cemetery
269 North Macquarie Rd, Calderwood	Lot 1 DP 558196	Hobby farm
Macquarie Rivulet	Bed to top of bank	
Public roads:	Calderwood Road, North Macquarie Road	

3.3 Existing Zoning

The site is currently zoned partly:

- 1(a) Agricultural under Shellharbour Rural Local Environmental Plan 2004; (SRLEP 2004);
- 7(n) Nature Conservation under SRLEP 2004;
- Non Urban 1A under Wollongong Local Environmental Plan 1990 (WLEP 1990).

SRLEP 2004 identifies the Macquarie Rivulet and Marshall Mount Creek corridors, Johnston's Spur and a corridor linking Johnston's Spur to Marshall Mount Creek as high conservation value.

The existing land use zones applying to the site are illustrated by **Figure 6** and summarised in **Table 9**. **Figure 6** also illustrates an 'area of high conservation value' identified on the site under SRLEP 2004.

The proposed Calderwood Urban Development Project is largely prohibited under the existing SREP 2004 and WLEP 1990 provisions. Rezoning of the site in the context of the proposed Concept Plan, if approved, is addressed in the State Significant Site Amendment at Section 6.

Table 9 – Summary of existing land use zonings

Zone	
1(a) Agricultural – SRLEP 2004	The 593 hectares of land located in the Shellharbour LGA is predominantly zoned 1(a) Agricultural under SRLEP 2004. The objectives of this zone primarily relate to the retention of high class agricultural land and to ensure that development and management of land within the zone has minimal environmental impact. The zoning prohibits subdivision that creates lots less than 40 hectares as well as a range of development for urban purposes. The proposed Calderwood Urban Development Project is largely prohibited under the 1(a) zoning.
7(n) Nature Conservation – Shellharbour RLEP 2004	An area of approximately 70 hectares (Johnson's Spur) and 4 smaller isolated parcels of land are zoned 7(n) Nature Conservation. The objectives of this zone primarily relate to the protection and enhancement of native vegetation and riparian and wildlife corridors, to minimise the impacts of development on the ecological and scenic attributes of the land, and to minimise the clearing of native vegetation. Permissible uses on the 7(n) zone are limited to subdivision to create lots 40 hectares or greater in size and other development for a limited range of purposes.
Non-Urban 1A – Wollongong LEP 1990	The 107 hectares of land within the Wollongong LGA is zoned Non-Urban 1A under WLEP 1990. The objectives of this zone primarily relate to the provision of a rural atmosphere on the outskirts of Wollongong, to provide a reservoir of land from which land for planned urban growth or environmental protection can be drawn and to allow development of an agricultural or peri-urban nature which does not impact on the current environmental quality or the future development potential of the land. A range of agricultural and urban uses are permissible with consent in this zone. The proposed Calderwood Urban Development Project is largely prohibited under the Non Urban 1A Zoning.

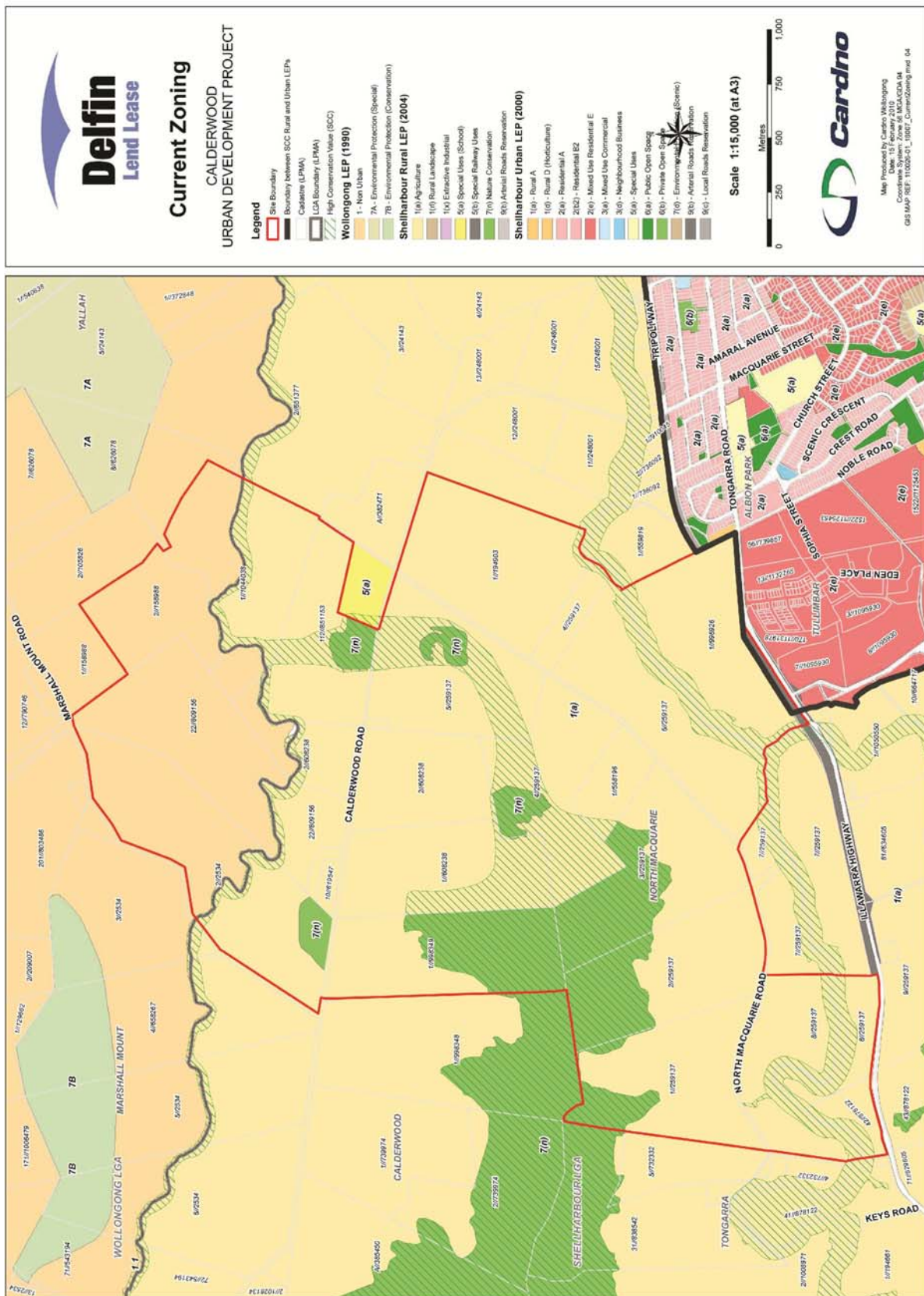


Figure 6 – Existing land use zonings

3.4 Existing and Future Land Uses

An aerial photograph of the site is included at **Figure 7**. General views of the site are illustrated in **Figures 8 (a) to (f)**.



Aerial Photograph (SH MGA 2001)

Part 3A | Calderwood Urban Development Project



Figure 7 – Aerial photograph of the site

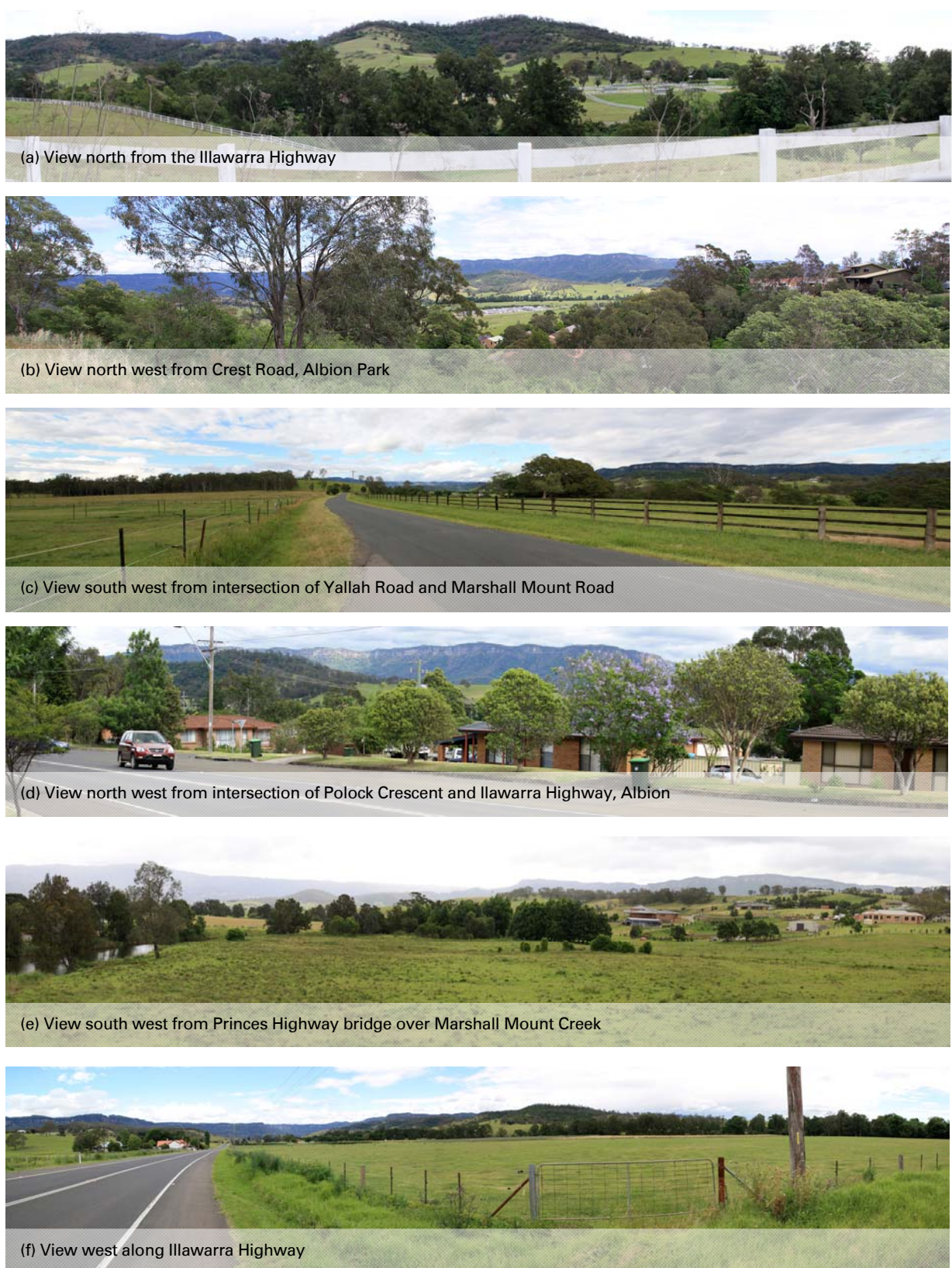


Figure 8 – General views of the site (Source: Calderwood Landscape and Visual Assessment, Environmental Partnership 2010)

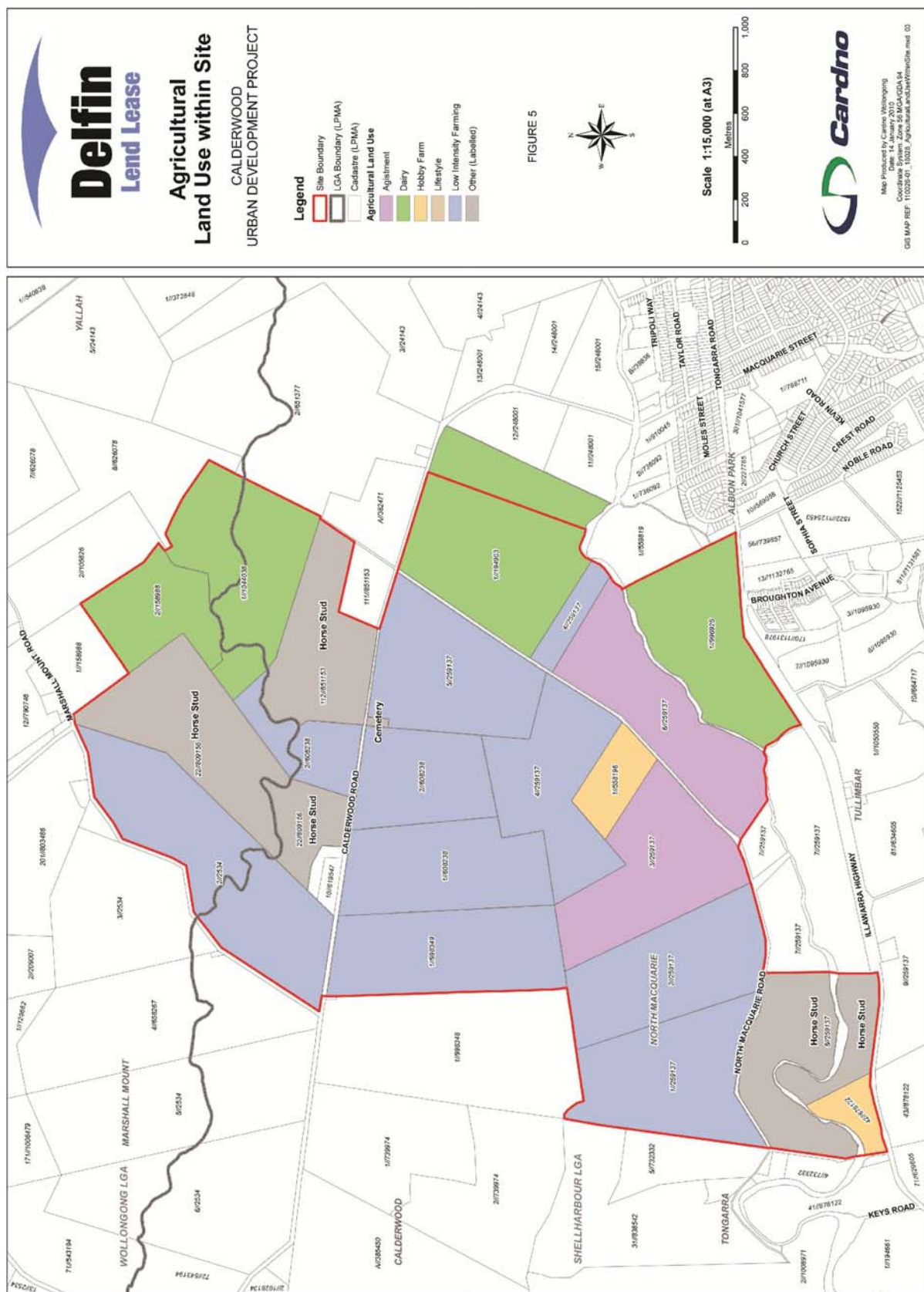


Figure 9 – Existing site land uses

The majority of the site is used for low intensity farming with some agistment and hobby farming. There are 3 horse studs and 2 operating dairies, a cemetery, church and private residences.

Existing land uses and development on the site are shown on **Figure 9** and summarised in **Table 8** above.

The area of the site used for key land uses is shown in **Table 10** below.

Table 10 – Current site agricultural land use (Source: Agricultural Land Study, Sphere Property Corporation, 2010)

Land use	Number of Lots	Total Area (ha)
Agistment	2	80.4
Dairy	4	147.0
Hobby Farm	2	16.4
Low Intensity Farming	10	337.4
Other	2	120.6
Total	20	701.8

Figure 10 identifies existing land uses on land adjoining the site. Land adjoining the site is currently used for a mix of dairying, hobby farming, low intensity farming, agistment and lifestyle activities.

3.5 Future Growth and Land Use Change

Notwithstanding the existing pattern of land uses, significant new residential and employment development is planned for the surrounding locality. In accordance with the IRS the Illawarra region will undergo significant urban growth and change in the 25 years to 2031.

The Illawarra Regional Strategy is shown at **Figure 11**.

Approximately 100 hectares of the site is located within the WDRA. The majority of the site is also located within the MDP boundary.

Figure 12 shows the relationship of the site to the MDP and WDRA boundaries.

Figure 13 below shows known future growth areas. These areas include developments for which consent has already been granted, and planned developments that are anticipated as likely to occur by 2031.

Regional land use planning assumptions relating to the known future growth areas illustrated on **Figure 13** are summarised in **Table 11**.

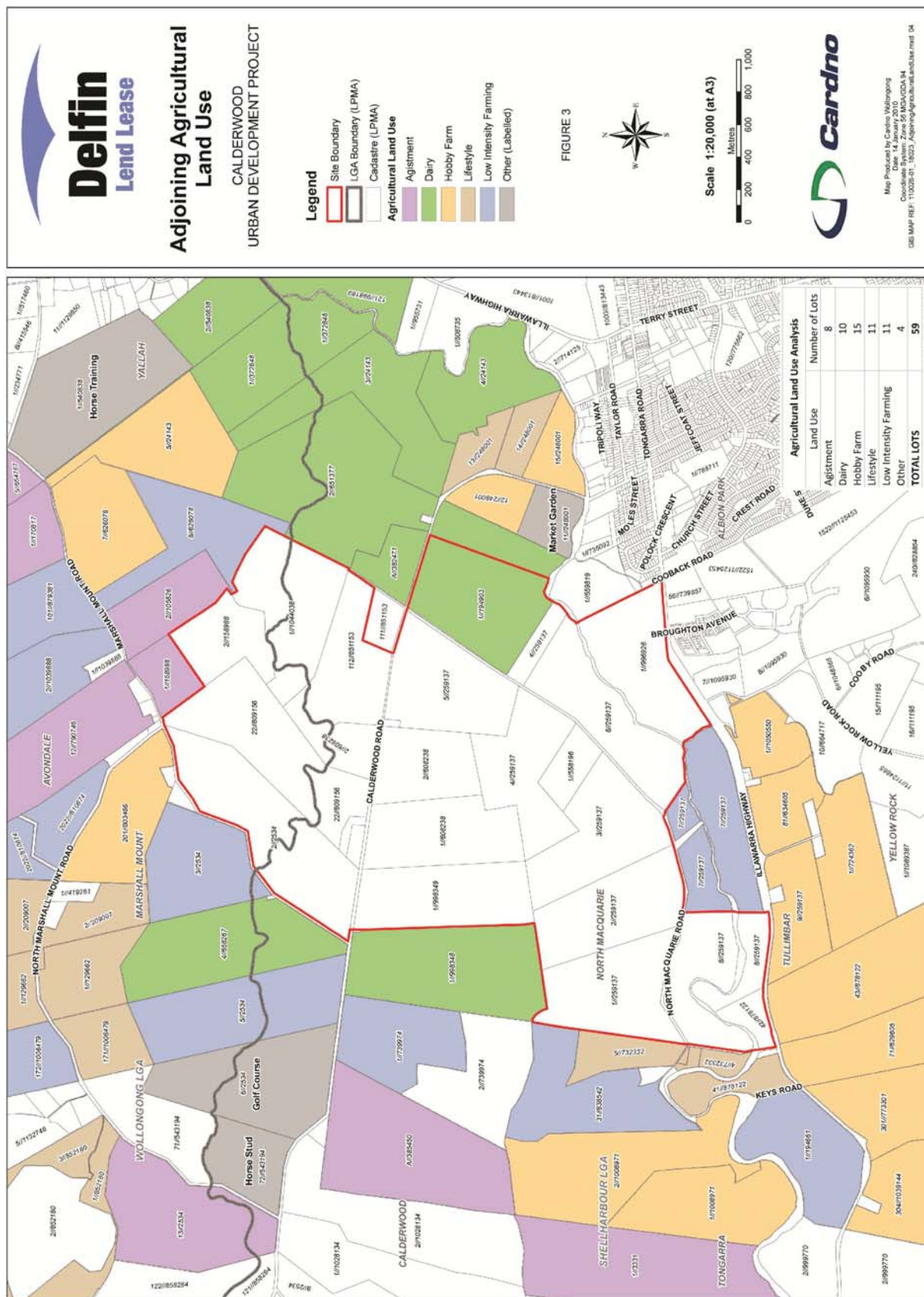


Figure 10 – Existing adjoining land uses

Table 11 – Regional land use planning assumptions (Source: TMAP, Cardno, 2010)

Proposal	Development by 2031
Approved projects	
Delmo Albion Park	1,650 jobs
Tullimbar	1,978 dwellings
Haywards Bay	318 dwellings
Shellharbour Town Centre	282 jobs
Dapto Town Centre	5,200 jobs/21,600 sqm employment
Shell Cove	1,135 dwellings
Illawarra International Health Precinct	100,000 sqm medical / hospital (approximately 1,383 jobs)
Proposed projects	
West Dapto Stage 1 – Kembla Grange Employment Land	175 ha employment land (assumed to be 10,355 jobs)
West Dapto Stage 1 – Sheaffs / Wongawilli	3,667 dwellings
West Dapto Stage 2 – West Horsley	2,496 dwellings
Tallawarra	700 dwellings
Avondale golf course	Golf course + 400 dwellings
Yallah / Marshall Mount	900 dwellings

Consideration of the Calderwood Urban Development Project in the context of other planned development will be required as part of the cumulative impact assessment of the project, particularly with respect to transport, utility services and human services.

The cumulative impacts of known future population growth areas and land use change are considered throughout this report, specifically relation to:

- Impact on regional agricultural practices and regional food production;
- Traffic growth and implications for road network improvements including staging and timing;
- Demand for utilities servicing infrastructure;
- Impact on flood extent and levels; and
- Demand for human services infrastructure.

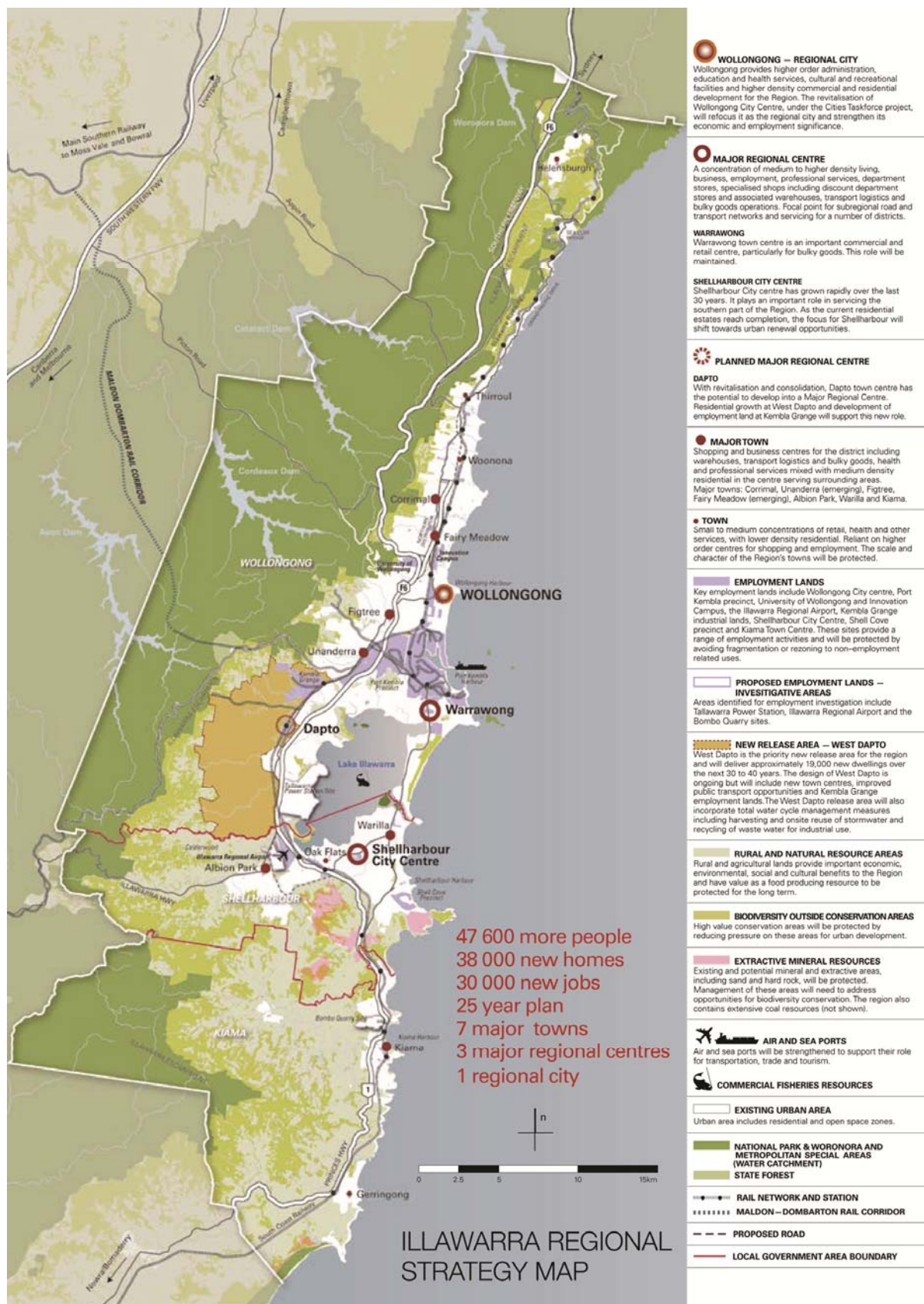


Figure 11 – Illawarra Regional Strategy (Source: Department of Planning)

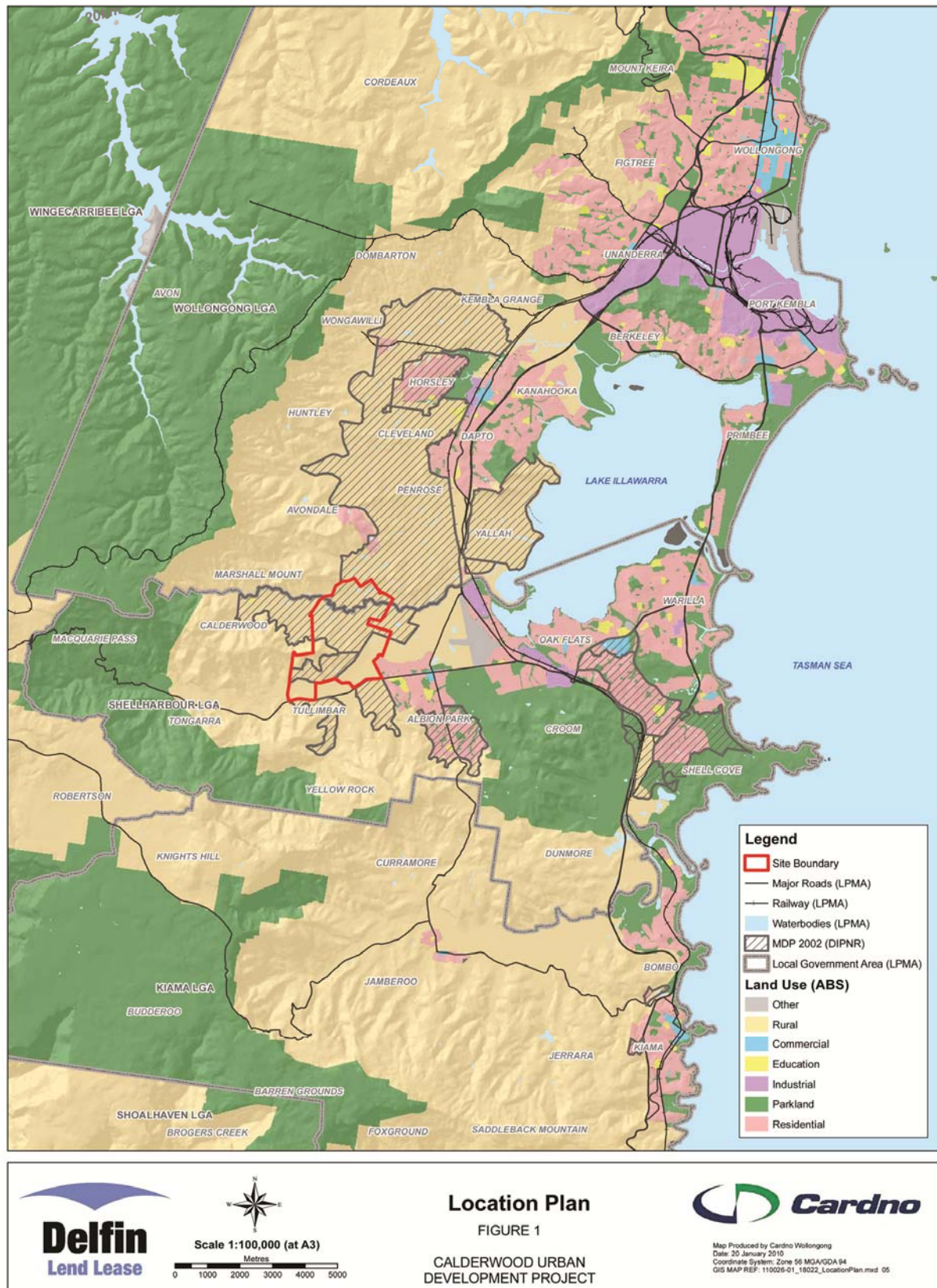


Figure 12 – Relationship of site to MDP boundary

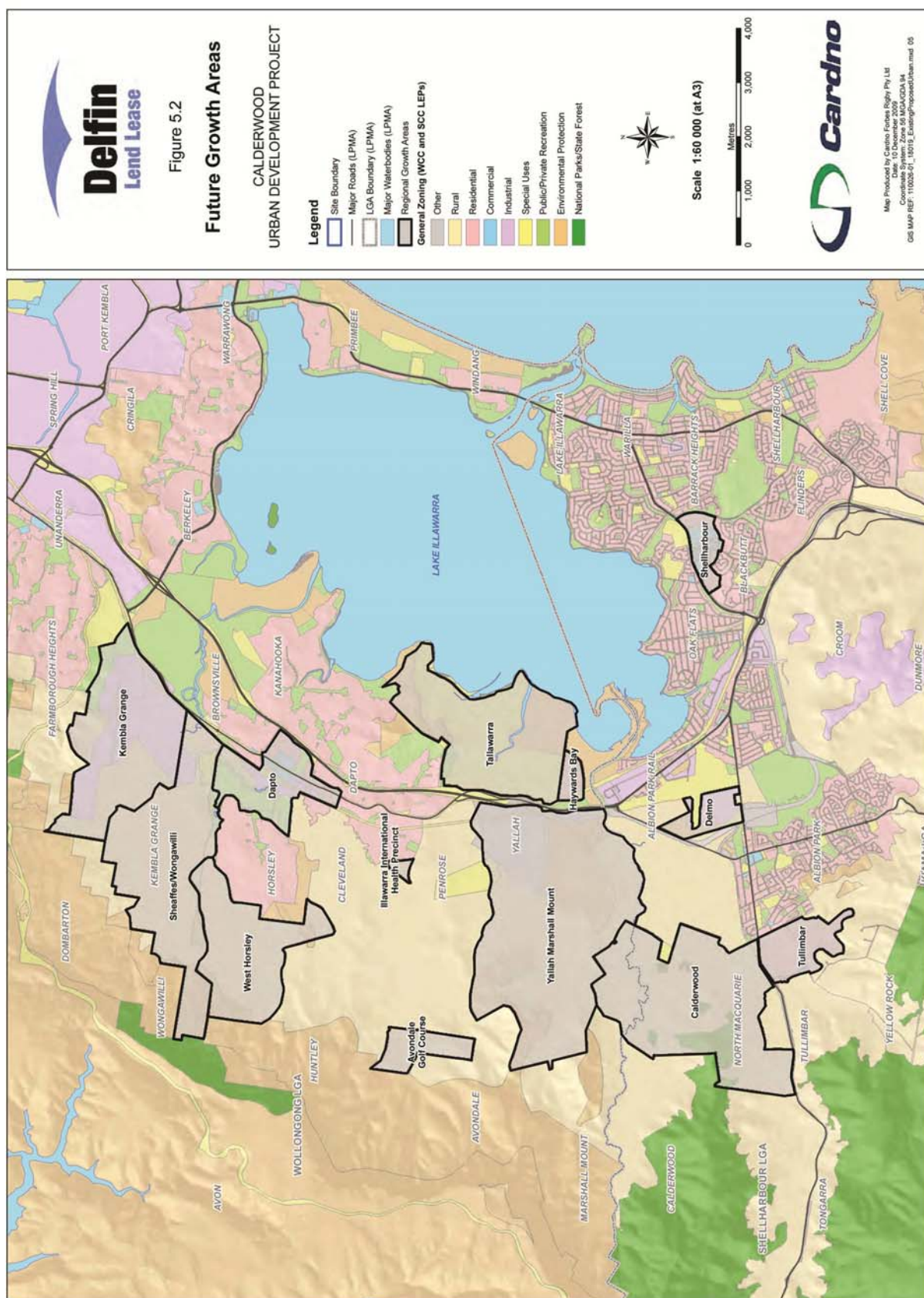


Figure 13 – Future growth areas (Source: TMAP, Cardno, 2010)

3.6 Agricultural Land Capability

An Agricultural Land Study for the site has been prepared by Sphere Property Corporation (refer **Appendix K**). As detailed in the Agricultural Land Study and summarised above currently only approximately 30% of the total site area is used for productive agricultural use.

Subdivided into blocks of approximately 40 ha some 40 years ago, the site does not include any regionally significant areas of food production, and is not identified as significant agricultural land, nor as productive resource land under the IRS.

No livestock or crop production activities (the major sectors dominating agricultural production in the Illawarra Region) occur within the site – it contains only small scale and low intensity farming activities. The site is also not located in or close to any area of regional agricultural significance. As shown by **Figure 10** (refer above) there are also no cropping or high intensity agricultural production activities currently occurring in the vicinity of the site.

Figure 14 shows the rural / urban interface of the Calderwood Urban Development site. This area is considered to be the ‘area of influence’ of the development with respect to potential impact on adjoining agricultural land. A significant proportion (approximately 70%) of land surround the site is used for hobby farming, lifestyle, low intensity farming or ‘other uses’. Dairying and agistment are the main productive agricultural land use in the locality. As such there are no impacts on primary production values or regionally significant areas of food production anticipated as a result of the project.

Analysis of land uses within the area of influence demonstrates that:

- More than half of the existing rural land within the ‘area of potential influence’ of the Calderwood Project has been identified by the State government for future urban development.
- The majority of land adjoining the Calderwood site to the north, south and east comprises existing urban development, land identified for future urban release, or rural land already strongly influenced and physically contained by its proximity to the existing urban areas of Tullimbar and Albion Park.
- More than half of the land adjoining the Calderwood site to the west comprises land identified for future urban release, or conservation lands.
- The Calderwood site is, to a large extent, physically contained, and geographically isolated from surrounding productive agricultural lands.

Implementation of the IRS will fundamentally change the existing rural character of the majority of land surrounding the Calderwood site. The locality will undergo transformation from the existing rural and agricultural land uses to urban development. This intended transformation underpins growth in the Illawarra.

As the majority of adjoining land currently used for the agricultural activities has been identified for future urban land release under the IRS and / or the MDP, any support of ongoing agricultural practices will remain only in the short term. Although a significant land use change is proposed, the Concept Plan proposal has responded to the potential longer term ongoing agricultural use of land in the area of potential impact by incorporating landscape and environmental buffers to adjoining land.

As recommended by the Department of Agriculture, existing cleared land within the floodplain that may be suitable for some potential ongoing agricultural uses in the future has been incorporated into open space corridors on the site so that any such opportunities are not precluded in the long term if deemed suitable for integration with neighbouring urban development.

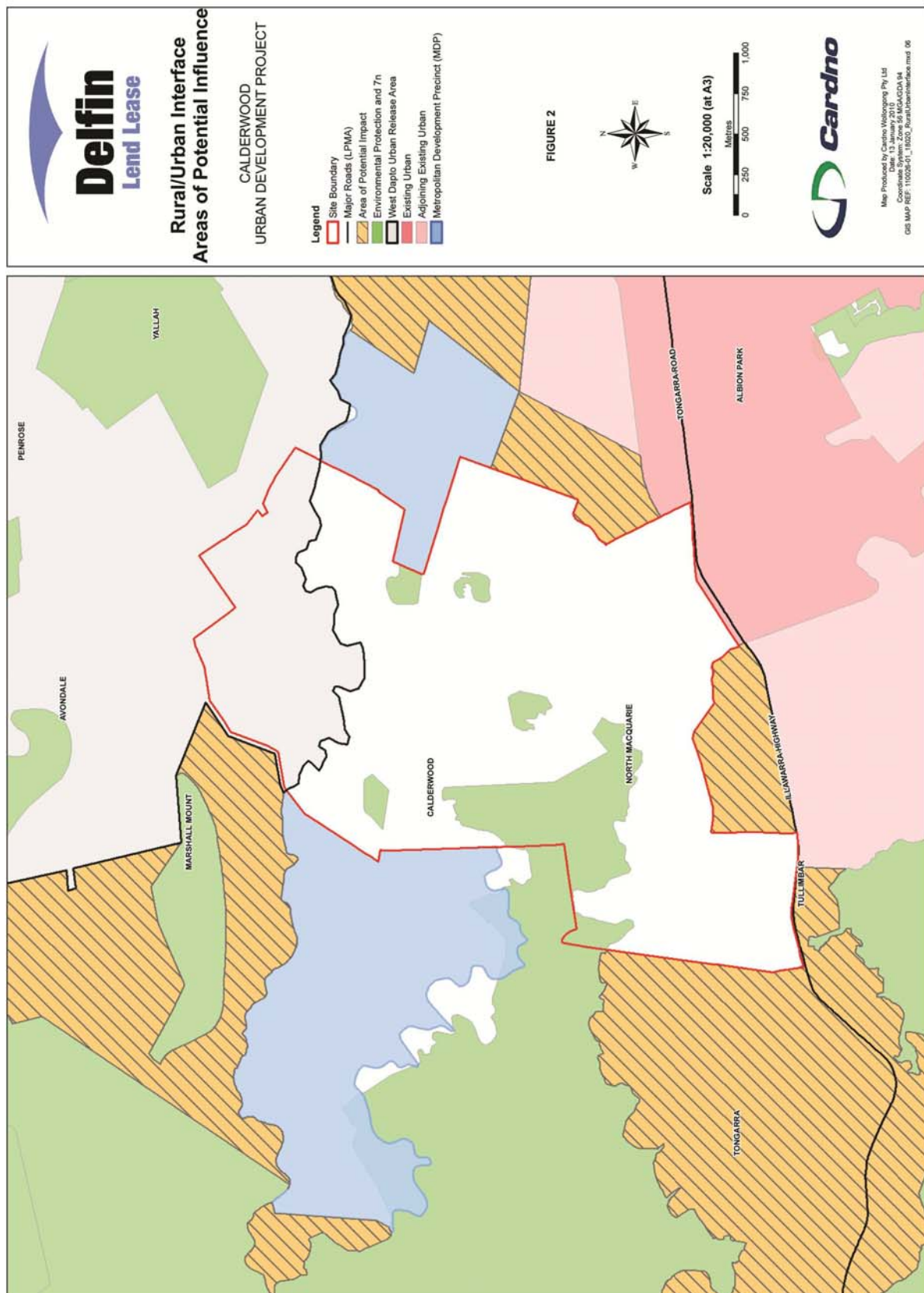


Figure 14 – Area of potential agricultural impact

3.7 Topography, Slope and Stability

Macquarie Rivulet and Marshall Mount Creek run west to east across the site in the south and north respectively. Topography across the site is varied, with flat flood plains bordering the two creeks to steep ground on the sides of Johnston's Spur. It ranges from gently sloping (0-5 degrees) in the east, with an elevation of about 10-15 metres, to undulating and steep (> 14 degrees) towards the west and south of the site. Johnston's Spur rises steeply to about 180 metres in the south west of the site.

The site is underlain by Quarternary sediments on the floodplains which include shale based soils in the lower lying areas generally south of Marshall Mount Creek, through sedimentary strata of the Berry Formation on the footslopes, to an outcrop of volcanic at the highest point of the site. There is also an area underlain by Budgong sandstone at the northern boundary of the site towards Marshall Mount.

The site topography is illustrated at **Figure 15**. **Figure 16** provides a site slope analysis.

Geological mapping and subsurface investigations have been undertaken by Douglas Partners (refer to Geotechnical Investigation included at **Appendix L**).

The geological mapping has indicated only isolated minor occurrences of slope instability.

Figure 17 shows the various stability zones within the site:

- *Stable land with no landslide problems.* Land within this zone encompasses the significant majority of the site.
- *Stable land – minor area of slope instability.* A small area of land (approximately 400 m x 200 m in area) located between the Macquarie Rivulet and the Illawarra Highway in the south-eastern corner of the site is located within this zone.
- *Less stable land that may mostly be safely utilised although some areas are unsuitable.* Land within this zone includes elevated ridge crest areas and mostly moderately sloping valley floors about gully lines north of North Maquarie Road within the south-western section of the site.
- *Moderately unstable land where thorough investigation is required before development and generally topographically high relief land underlain by potentially unstable material.* Land located within this zone occupies moderate to steep, mid and upper slope locations along the east west oriented ridge within the southern section of the study area. It also includes locally over-steepened gully heads.
- *Essentially unstable land, that is best left undeveloped but some areas may be developed after detailed evaluation.* Land within this zone comprises only two ridge crest and steep to very steep upper slope areas along the east-west oriented ridge of Johnston's Spur within the southern section of the site.

Most of the site is therefore classified as either very low or low risk with respect to instability, with construction considered to be relatively straight forward. The steeper areas of the site classified as less stable or moderately unstable land will require engineering works to be undertaken at detailed design stage to achieve a low risk classification of instability. Such engineering works are readily delivered, and therefore stability is not considered to present a significant site constraint.

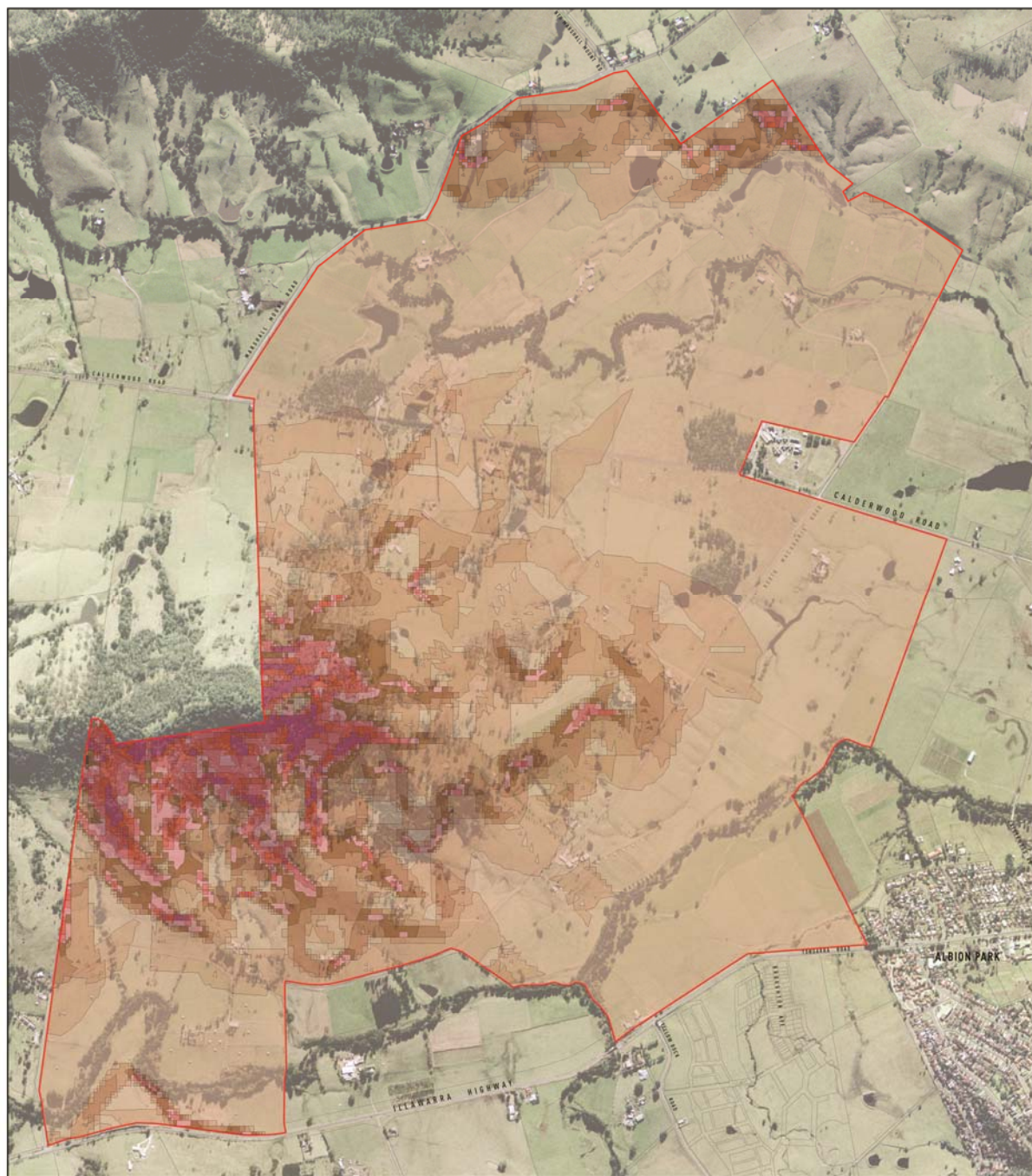


Terrain

Part 3A | Calderwood Urban Development Project



Figure 15 – Site topography

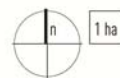


Slope

Part 3A | Calderwood Urban Development Project



Delfin
Land Lease



m 0 100 500 1,000

Subject to verification and detailed site survey 1:20,000 IB A4 10m Contours February 2010

Figure 16 – Slope analysis



Ground Stability

Part 3A | Calderwood Urban Development Project

-  Essentially Unstable Land
-  Moderately Unstable Land
-  Less Stable Land
-  Stable Land - Minor Area of Slope Instability

Delfin
Land Lease



m 0 100 500 1,000

Subject to verification and detailed site survey 1:20,000 @ A4 10m Contours February 2010

Figure 17 – Ground stability

3.8 Hydrology and Geomorphology

A Geomorphology Report and a Water Cycle Management Study prepared by Cardno are included at **Appendix M** and **N** respectively.

The whole of the development site lies within the Macquarie Rivulet catchment, within the Lake Illawarra sub-basin.

The Macquarie Rivulet catchment (approximately 10,500 ha) is located between the Illawarra Escarpment to the west and Lake Illawarra to the east. Marshall Mount Creek (approximately 1,900 ha), joins Macquarie Rivulet downstream of the village of Albion Park (and the development site), forming a broad floodplain at and upstream of the junction of the two streams.

The site is broadly contained by the mainstream of Macquarie Rivulet to the south, Marshall Mount Creek to the north and the broad floodplain of the merged streams to the east.

The Macquarie Rivulet catchment, including Marshall Mount Creek, is the largest contributing sub-catchment of Lake Illawarra, a regionally significant water body.

Macquarie Rivulet is one of the major watercourses in the southern Illawarra. It drains a large catchment of approximately 10,500 ha over a range of different land uses with its headwaters located above the Illawarra Escarpment.

Within the site, Macquarie Rivulet exhibits a distinctive meander pattern. The presence of terraces along the channel provides evidence of high flow events. The Rivulet has a deep, wide channel, which is the result of erosion caused by clearance of land for rural activities. The Rivulet has very little remaining native vegetation on its banks – revegetation comprises mainly weeds and exotics. There is no evidence of lateral movement over the past 60 years.

Marshall Mount Creek also has its headwaters in the Illawarra Escarpment, but drains a smaller area of approximately 1,900 ha and carries less flow volume. The Creek is an intermittent stream which exhibits pooling during low flow regimes. The channel is mostly devoid of vegetation, with bank vegetation comprised mainly of grasses, pasture species and weeds. There is a sparse cover of trees in the riparian zone.

Just before it enters the site, Marshall Mount Creek becomes shallow and unconfined with a large flat floodplain. The banks of the Creek are very steep and there is evidence of lateral movement of the channel and/or bank collapse.

Towards the lower end of the site, Marshall Mount Creek is relatively straight, and due to the lack of perennial flows, does not contain an immediately visible flow channel. The channel is wide and deep in these reaches and contains very little vegetation on the banks, with the exception of grass.

The Macquarie Rivulet catchment is principally rural in character and is used for low scale dairy and beef cattle grazing. However, the headwaters of the catchment, which are located on the Illawarra Escarpment and unsuitable for grazing, retain large tracts of natural forest. Marshall Mount Creek is a major tributary of Macquarie Rivulet. Its catchment is similar in character to Macquarie Rivulet though it retains a smaller proportion of forest in its headwaters.

Development within the combined catchments is currently limited to the township of Albion Park, the new Haywards Bay residential estate and light industrial areas around Yallah. Located within the lower part of the catchment, these areas drain into Macquarie Rivulet downstream of the Calderwood Urban Development Project site.

Water quality in Macquarie Rivulet is relatively good compared to the more highly urbanised Lake Illawarra catchments further to the north and east that do not have specific water quality control measures in place.

As Macquarie Rivulet and Marshall Mount Creek perform critical drainage and flood mitigation functions, they are proposed to be protected as part of the site riparian corridor network and brought into public ownership. The riparian corridors are to be zoned SP2 Infrastructure (local drainage) and integrated with areas of immediately adjoining public open space.

3.9 Acid Sulphate Soils

An Acid Sulphate Soils Assessment for the site has been undertaken by Douglas Partners (refer to **Appendix O**).

The assessment indicates that acid sulphate soils (ASS) are present within parts of the site, generally below depths of 2 – 3 metres. Generally, the ASS are distributed in the alluvial deposits surrounding Macquarie Rivulet and Marshall Mount Creek.

Areas of Class 4 and Class 5 ASS are identified on Figure 18.

It is noted that parts of the eastern extents of the site are included on the Wollongong Acid Sulphate Soil Risk Map published by the NSW Department of Land and Water Conservation (1997) as having a low probability of finding ASS below a depth of 3 metres.

The extent of ASS in these areas will require further investigation once final cut and fill levels have been determined for these areas. Notwithstanding, ASS are only a moderate constraint to development, and can be appropriately managed with good engineering practice.



Acid Sulphate Soils Map

Part 3A | Calderwood Urban Development Project

- Class 4 Acid Sulphate Soils
- Class 5 Acid Sulphate Soils
- Land parcel requiring further assessment at detailed design stage

Delfin
Land Lease



0 100 500 1,000
m

Subject to verification and detailed site survey 1:20,000 R A4 10m Contours February 2010

Figure 18 – Areas of potential acid sulphate soils

3.10 Riparian Corridor Classification

During consultation with DECCW, a preference was identified for the development to maintain consistency with the Riparian Corridor Management Study (RCMS) 2004. DECCW requires any deviations to the RCMS to be identified and justified.

A Riparian Consistency Report prepared by Ecological is included at **Appendix P**.

A number of methodologies have been used in the Riparian Consistency Report to map streams and riparian corridors on the site. The report considers the site in the context of the existing RCMS and the most recent published riparian corridor Guidelines under the Water Management Act, 2000.

The Guidelines published by DECCW under the Water Management Act are based on the methodology developed under the RCMS. The guidelines are based on the categorisation of watercourses with a defined set of guidelines to establish a Core Riparian Zone (CRZ), Vegetated Buffer (VB) and an Asset Protection Zone (APZ).

Initial identification of watercourses was based on 1:25,000 topographic map data and review of the RCMS and mapping provided by DECCW for the Macquarie Rivulet Catchment. This data was augmented through high resolution LIDAR survey to identify the current location of channels and top of bank.

For the purposes of riparian assessment, in accordance with the Guidelines under the Water Management Act existing water courses have been classified in accordance with the Strahler categorisation system.

All watercourses on the site have been ground truthed, including assessment as part of the Geomorphology Report included at **Appendix M**.

An extensive field survey process was undertaken, incorporating a variety of professional fields including planning, environmental engineering, geomorphology, biodiversity, bushfire and landscape architecture.

As identified above, the Geomorphology Assessment undertaken by Cardno (refer **Appendix M**) considered the hydro geological function of mapped water courses and identified a small number of mapped water courses that due to the small catchment size and subsequent limited hydrological function were excluded from further assessment. Existing water course categorisation (ground truthed Strahler) is shown at **Figure 19**.

This categorisation has been used as the basis for development of the proposed Riparian Corridor Network that forms part of the Concept Plan proposal (refer to Section 4.6 and **Figure 47**) and as the basis for the assessment of the impact of the proposed development.

As detailed at Section 4.5 (Concept Plan):

- 18 mapped stream segments (segments 1, 7, 8, 15, 18, 23, 26, 24, 32, 33, 34, 35, 40, 42, 44, 45, 46 and 48) are proposed to be consistent with the RCMS;
- 10 mapped stream segments (2, 17, 27, 28, 29, 36, 37, 43, 47, 49) are proposed to be a higher category than the RCMS;
- 6 first order drainage lines 3, 5, 6, 9 and 10 and second order stream 4 shown on **Figure 19** are proposed to have a lower categorisation than the RCMS;
- 13 small ephemeral first order drainage lines 11-14, 16, 19, 20, 22, 25, 30, 31, 38 and 39 shown on **Figure 19** are proposed to be removed as part of the proposal.

When compared to the output of the RCMS, the proposed approach for the site identifies a greater area of land for inclusion in riparian and environmental corridors than that provided by the RCMS.

The Concept Plan includes approximately 113 hectares of land within the Core Riparian Zones of the proposed Riparian Corridor Network. By comparison, categorisation of streams under the RCMS methodology would result in approximately 96.5 hectares of riparian land.

In addition to the approximately 113 hectares of Core Riparian Zone land, there are extensive areas of public open space that are proposed to immediately adjoin the CRZs. These areas of public open space substantially increase the environmental outcomes beyond the area afforded through the riparian strategy alone.

A detailed assessment of the differences between the RCMS and Strahler categorisation methodologies is provided in the Riparian Consistency Report at **Appendix P** and at Section 7.7 of this report.



Figure 19 – Riparian classifications (Source: Riparian Consistency Report, Ecological)

3.11 Ecological Characteristics and Values

A Flora and Fauna Assessment prepared by Ecological is included at **Appendix Q**. The key ecological characteristics and values of the site are identified below.

Vegetation communities

There is a total of 104.35 ha of native vegetation on the site. Subject to long term rural land uses, over 85% of the site has been heavily modified by clearing for grazing, particularly on the lower slopes and foothills. **Figure 20** shows the distribution of existing vegetation community types and conditions within the site. Existing native vegetation communities have been identified as follows:

- Coastal Grassy Red Gum Forest
- Floodplain Wetland
- Lowland Dry-Subtropical Rainforest
- Lowland Woollybutt-Melaleuca Forest
- Moist Box-Red Gum Foothills Forest
- Riparian River Oak Forest

Of the native vegetation communities identified, four are sub-sets of Endangered Ecological Communities (EEC) listed under the NSW Threatened Species Conservation Act 1995 (TSCA) as identified in **Table 12** below.

Table 12 – Endangered ecological communities (Source: Flora and Fauna Assessment, Ecological, 2010)

EEC Listed on Schedule 1 of TSCA	Corresponding Sub-Community on Site
Illawarra sub tropical rainforest in the Sydney Basin	Lowland Dry-Subtropical Rainforest
Illawarra lowlands grassy woodland in the Sydney Basin	Lowland Woollybutt-Melaleuca Forest
	Coastal Grassy Red Gum Forest
River-Flat Eucalypt Forest on Coastal Floodplain	Riparian River Oak Forest

Ecological has determined that none of the vegetation communities found on the site, or immediately adjoining the site, are matters of National Environmental Significance (NES) under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBCA).

As detailed in the Flora and Fauna Assessment, Johnston's Spur, which extends into the middle portion of the site, comprises the largest patch of native vegetation remaining on site. It comprises Coastal Grassy Red Gum Forest (an EEC), Moist Box-Red Gum Foothills Forest and Lowland Dry-Subtropical Rainforest (and EEC). The core area of the Coastal Grassy Red Gum Forest is in moderate condition, with the outer margins comprising scattered trees. Acacia scrub regrowth (13.6 ha) and weeds and exotics (approximately 15 ha).

Johnston's Spur has been identified as an area of high conservation value by Department of Environment Climate Change and Water (DECCW), Wollongong Council and Shellharbour Council.

The Flora and Fauna Assessment also evaluations the ecological values of Johnston's Spur and Yallah-Calderwood Regional Habitat Corridor.

Riparian vegetation along Marshall Mount Creek and Macquarie Rivulet comprises approximately 23.3 ha of Riparian River Oak Forest (an EEC). This is mostly contiguous, highly disturbed and regenerating.

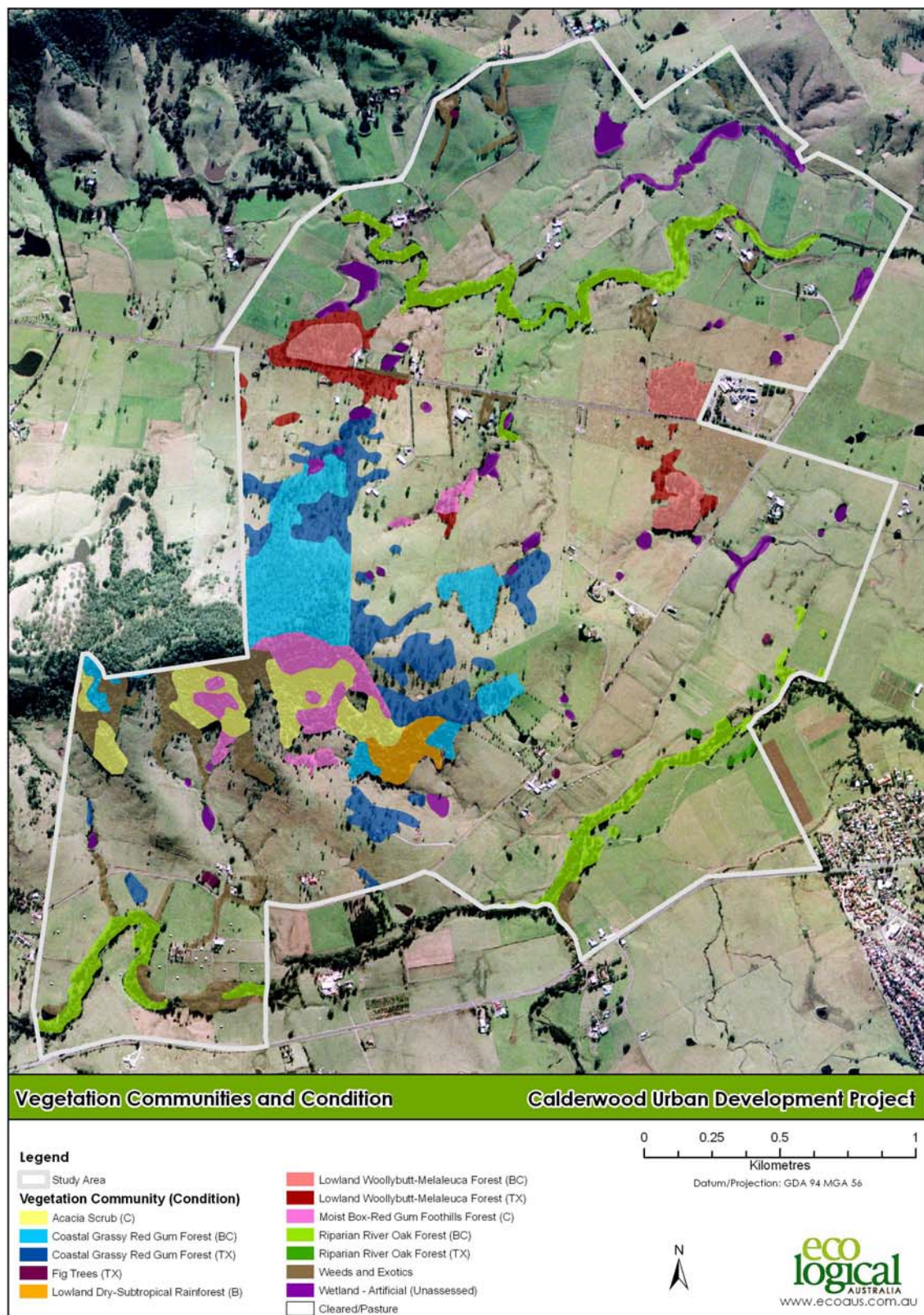


Figure 20 – Existing vegetation communities and conditions (Source: Flora and Fauna Assessment, Ecological, 2010)

There are three pockets of Lowland Woollybutt-Melaleuca Forest (an TSCA EEC). The core of these areas is moderately disturbed (about 10 ha collectively). The margins comprise scattered trees (about 7 ha collectively).

The strategic conservation planning undertaken by Ecological has determined that of the total 104.35 ha of native vegetation on the study site, 67.09 ha is classified as primary vegetation, equating to 9.53% of the total site area. A further 3.7% of the site area comprises support for primary vegetation.

The conservation significance of existing vegetation is shown on **Figure 21**. The project design has been undertaken with close regard to the findings of the Flora and Fauna Study which has formed a fundamental part of the determination of the urban capable footprint of the site. This has resulted in the preservation of areas of high conservation value as shown in **Figure 21**. Johnston's Spur and areas of significant remnant primary vegetation are to be zoned E2 Environmental Conservation to ensure its conservation into the future.

Threatened species and populations

The Flora and Fauna Assessment details threatened flora species and populations that have been recorded within a 10km radius of the site. Eight threatened flora species and two flora populations are considered likely to occur or to have the potential to occur within the site:

- White flowered Wax Plant *Cynanchum elegans*
- Illawarra Socketwood *Dephandra sp. Illawarra*
- *Grevillea parviflora*
- *Lespedeza juncea*
- Spiked Rice-flower *Pimelea spicata*
- Illawarra Greenhood *Pterostylis gibbosa*
- Austral Toadflax *Thesium australe*
- Hill Zieria *Zieria granulata*

The status of these species and populations under the TSCA and EBCA summarised in Table 3 of the Flora and Fauna Assessment at **Appendix Q**.

Twenty two threatened fauna species were found to be likely to occur or to have potential to occur on site, of which 8 are listed under the EPBC Act.

- | | | |
|-------------------------|----------------------------|--------------------------------|
| ■ Fork-tailed Swift | ■ Rainbow Bee-eater | ■ Large-eared Pied Bat |
| ■ Cattle Egret | ■ Turquoise Parrot | ■ Eastern False Pipistrelle |
| ■ Australasian Bittern | ■ Powerful Owl | ■ Eastern Bent Wing Bat |
| ■ Gang Gang Cockatoo | ■ Olive Whistler | ■ Grey-headed Flying fox |
| ■ Glossy Black Cockatoo | ■ Pink Robin | ■ Yellow-bellied Sheathail-bat |
| ■ Black Bittern | ■ Australian Painted Snipe | ■ Greater Broad-nosed Bat |
| ■ Swift Parrot | ■ Painted Snipe | |
| ■ Square-tailed Kite | ■ Freckled Duck | |

The status of these species and populations under the TSCA and EBCA is summarised in Table 4 of the Flora and Fauna Assessment at **Appendix Q**.

Riparian and aquatic values

Ecological has assessed the habitat value and condition of Marshall Mount Creek and Macquarie Rivulet as shown on **Figure 17**. Both streams have highly disturbed, regenerating native riparian vegetation (Riparian River Oak Forest) and provide habitat for aquatic and riparian species. Stream condition deteriorates from moderate to poor moving downstream in Marshall Mount Creek. Stream condition is better overall in Macquarie Rivulet (moderate/good).



Figure 21 – Conservation significance assessment (Source: Flora and Fauna Study, Ecological, 2010)

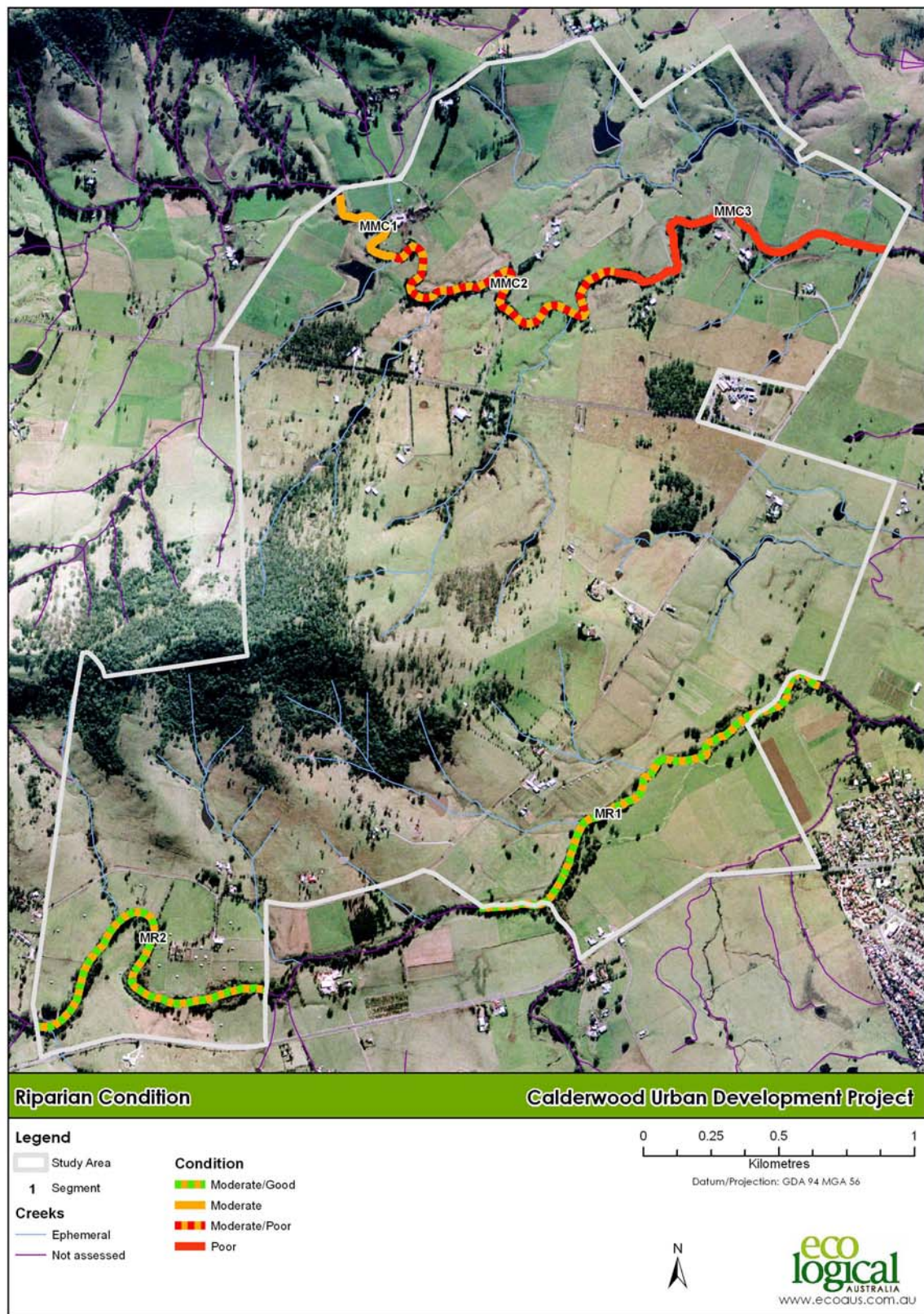


Figure 22 – Riparian condition (Source: Flora and Fauna Assessment, Ecological, 2010)

Figure 23 identifies conservation areas based on the conservation significance assessment and constraints analysis undertaken by Ecological. These areas have been incorporated as a fundamental element of the Concept Plan, forming a significant element of the proposed conservation lands, riparian corridor network and landscape and open space master plan for the development. They will be protected by an E2 Environmental Conservation or E3 Environmental Management land use zoning under the SEPP Amendment. **Figure 24** illustrates how the on site conservation areas would contribute to potential future regional linkages.

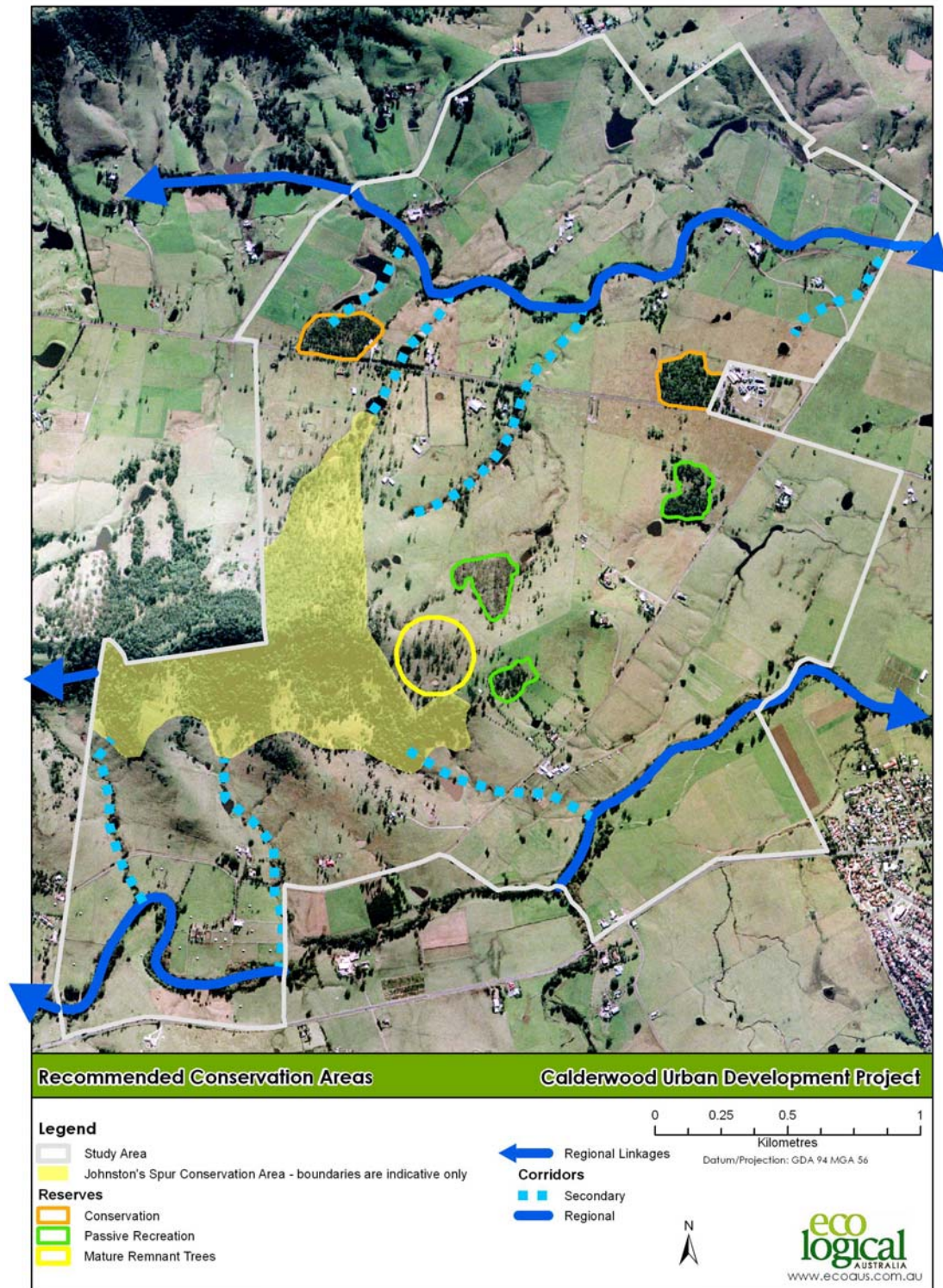


Figure 23 – Recommended conservation areas

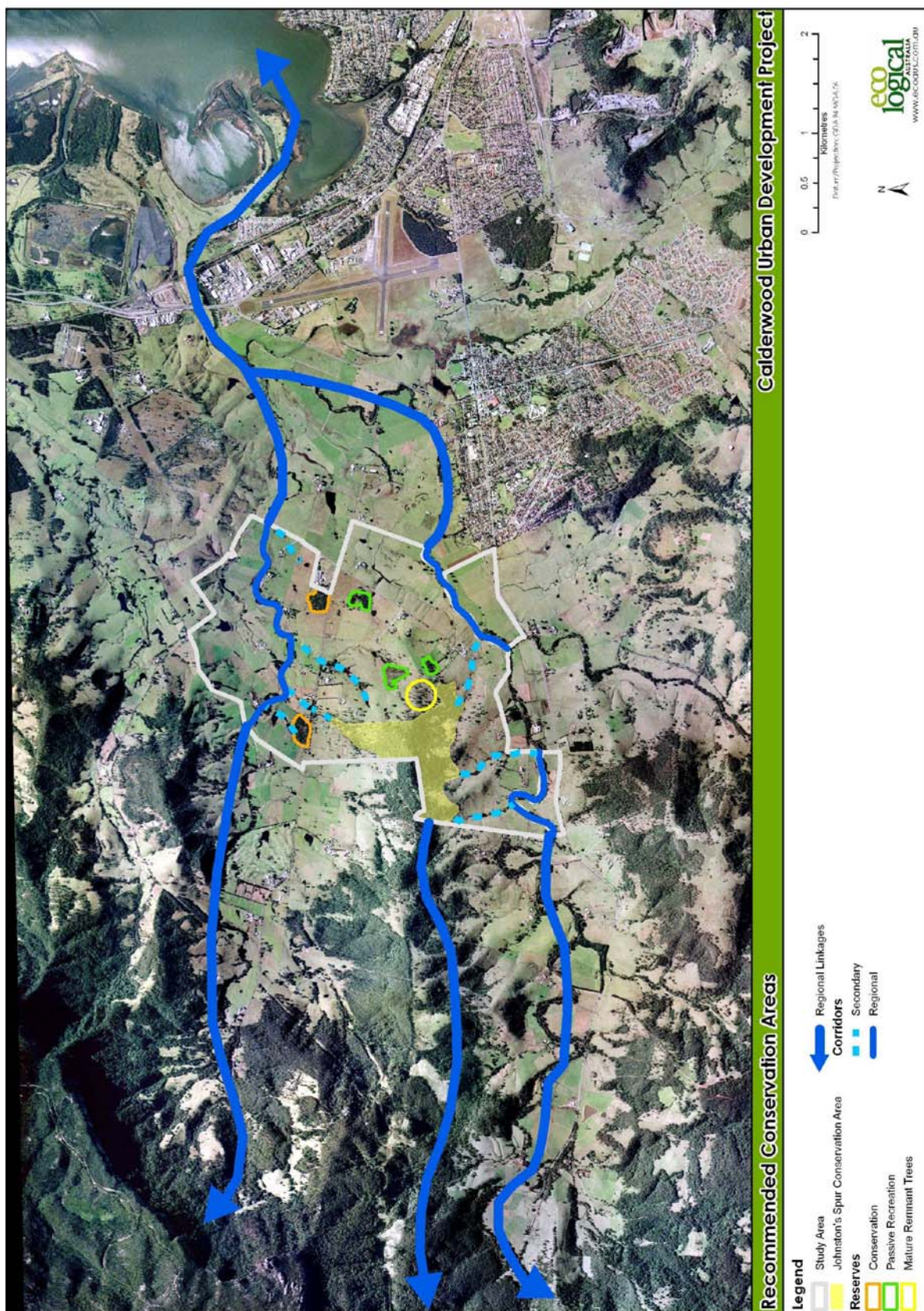


Figure 24 – Regional connectivity

3.12 Flooding and Stormwater

3.12.1 Climate change

It is widely accepted that climate change will lead to increased potential evapo-transpiration and decreased rainfall for the south-east of Australia. These conclusions are based on results from global climate model simulations undertaken with over 23 climate models from various institutions around the world. These model simulations also indicate that there will be less frequent but more intense storm events under future climate change scenarios.

The future climate will depend on human activities, such as energy generation, transport, agriculture, land-clearing, industrial processes and waste. To provide a basis for estimating future climate change, the Intergovernmental Panel on Climate Change (IPCC 2000) prepared 40 greenhouse gas and sulfate aerosol emission scenarios for the 21st century. The IPCC's scenarios combine a variety of assumptions about demographic, economic and technological factors likely to influence future emissions.

As part of the analysis of existing and future environmental conditions undertaken by Cardno, a medium rate of global change based on the *Special Report on Emission Scenarios* (SRES) **A1B** storyline and scenario family has been selected for the Project. This describes a future world where globalisation is dominant. Economic growth is rapid and population growth is low with the rapid development and deployment of more efficient technologies. There is a balance between fossil fuel use and other energy sources. Major underlying themes are economic and cultural convergence and capacity building, with a substantial reduction in regional differences in per capita income. A medium climate sensitivity has been assumed, i.e. a sensitivity corresponding to a global warming of 2.6 degrees for a doubling of CO₂ from 280 ppm to 560 ppm (CSIRO, 2007).

This scenario assumes a:

- 7.5% decrease in annual rainfall by 2070;
- 20% increase in rainfall intensity;
- 9% increase in annual evap-transpiration; and
- Fall in the average number of wet days per year from 73.7 to 33.

All stormwater and flood impact modelling for both analysis of existing conditions and assessment of the impacts has taken into account this climate change scenario.

3.12.2 Existing flood conditions

A detailed analysis of the existing site hydrology and flooding is contained within the Water Cycle Management Study (WCMS) and Floodplain Risk Management Study (FRMS) prepared by Cardno included at **Appendices N** and **R** respectively.

Parts of the site are flood prone.

A combination of limited bank capacity of streams and broad, flat, well defined floodplains results in the development of areas of flood plain inundation in most significant flood events.

Figure 25 shows the existing 1% AEP flood depths and levels across the site and its immediate surrounds.

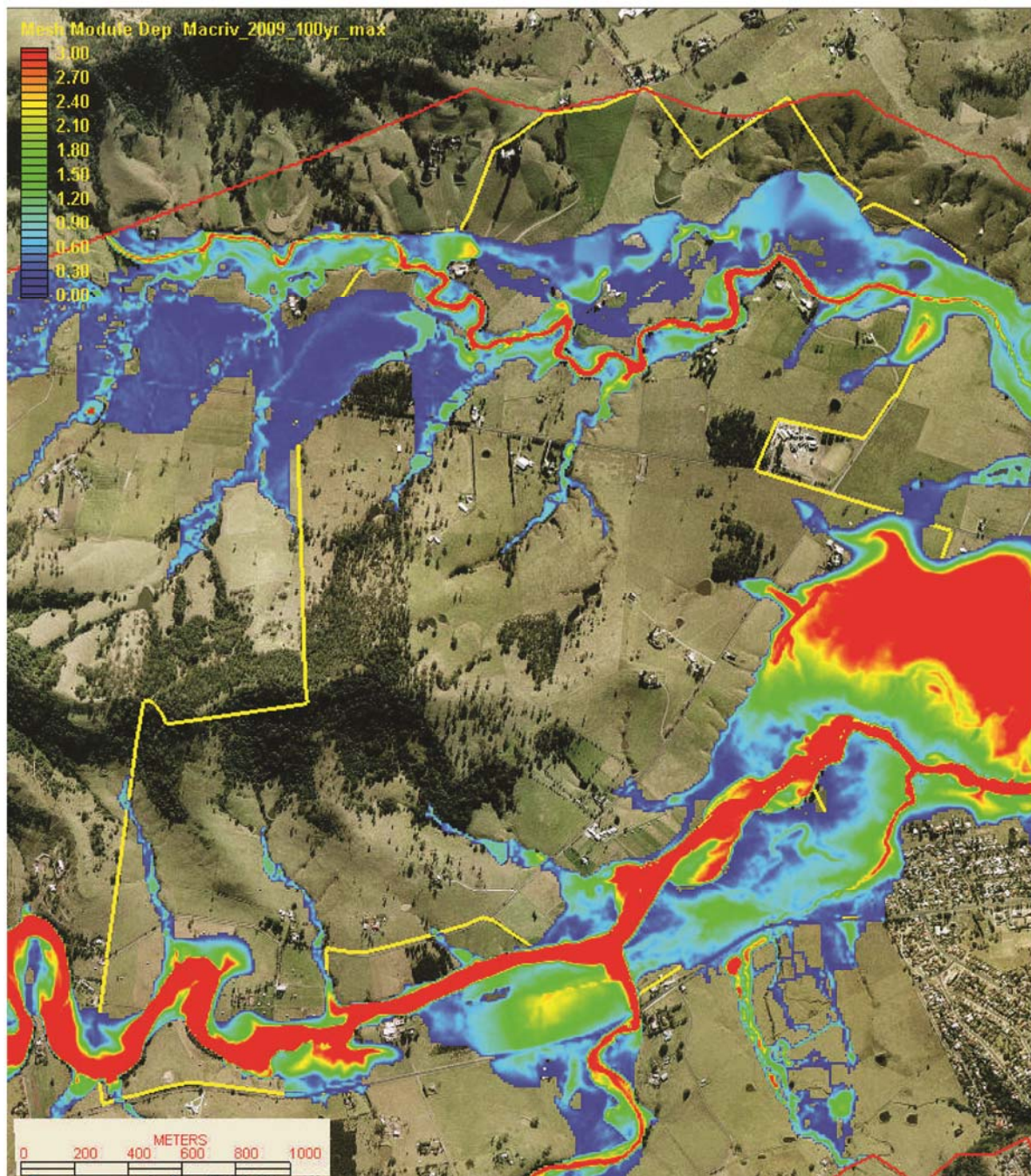


Figure 25 – Existing 1% AEP flood depths and levels (Source: Flood Study, Reinco, 2010)

As shown at **Figure 25** in a 1% AEP flood event, Macquarie Rivulet inundates most of the low lying land along the southern boundary of the site and Marshall Mount Creek inundates a substantial portion of the low lying land in the northern half of the site. In both zones of inundation, substantial secondary overland flow paths are evident, flowing at considerable depth and velocity at the peak of a 1% AEP flood.

Most of the portions of the site that are inundated during a significant flood event present a 'high' provisional hydraulic hazard in accordance with the Floodplain Development Manual 2005. Some areas of 'low' provisional hydraulic hazard are present in both valleys between the mainstream and secondary floodways and on steeper land on the side slopes of tributary streams, particularly on the southern face of Marshall Mount valley in the vicinity of the western boundary of the site. **Figure 26** shows the existing 1% AEP provisional hydraulic hazard.

Because the site is a large landholding under single control, key opportunities are presented to mitigate existing flood impacts via development of an integrated flood mitigation plan and riparian strategy that coordinates the management of hydraulic impacts, ecological outcomes and future ownership and maintenance issues.

Assessment of existing site flood conditions and determination of an appropriate floodplain management strategy for the Project has formed a fundamental component of the site constraints and opportunities analysis and the determination of the urban capable footprint of the site.

To determine the optimum flood mitigation measures for the Project, including opportunities for re-shaping of the flood plain to optimise the urban capable footprint, a number of design iterations were undertaken and modelled by Cardno.

The final design iteration and subsequent identification of opportunities to re-shape the floodplain within the boundaries of the site to reduce flood impacts has been incorporated into site constraints analysis (refer to **Figure 40**) and is part of the Concept Plan proposal.

Modelling of climate change scenarios shows that for the 1% AEP flood event, the average increase in flood levels across the existing site is approximately 200 mm.

No part of the site will be subject to sea level inundation under any climate change scenario modelling.

The Concept Plan incorporates a Flood Mitigation Plan that responds to the existing flood conditions on the site, and to the future increases in flood levels that have been determined as likely to occur under the identified climate change scenario. The Flood Mitigation Plan has been integrated with the water sensitive urban design strategy, biodiversity conservation outcomes and riparian management outcomes to ensure an holistic approach.

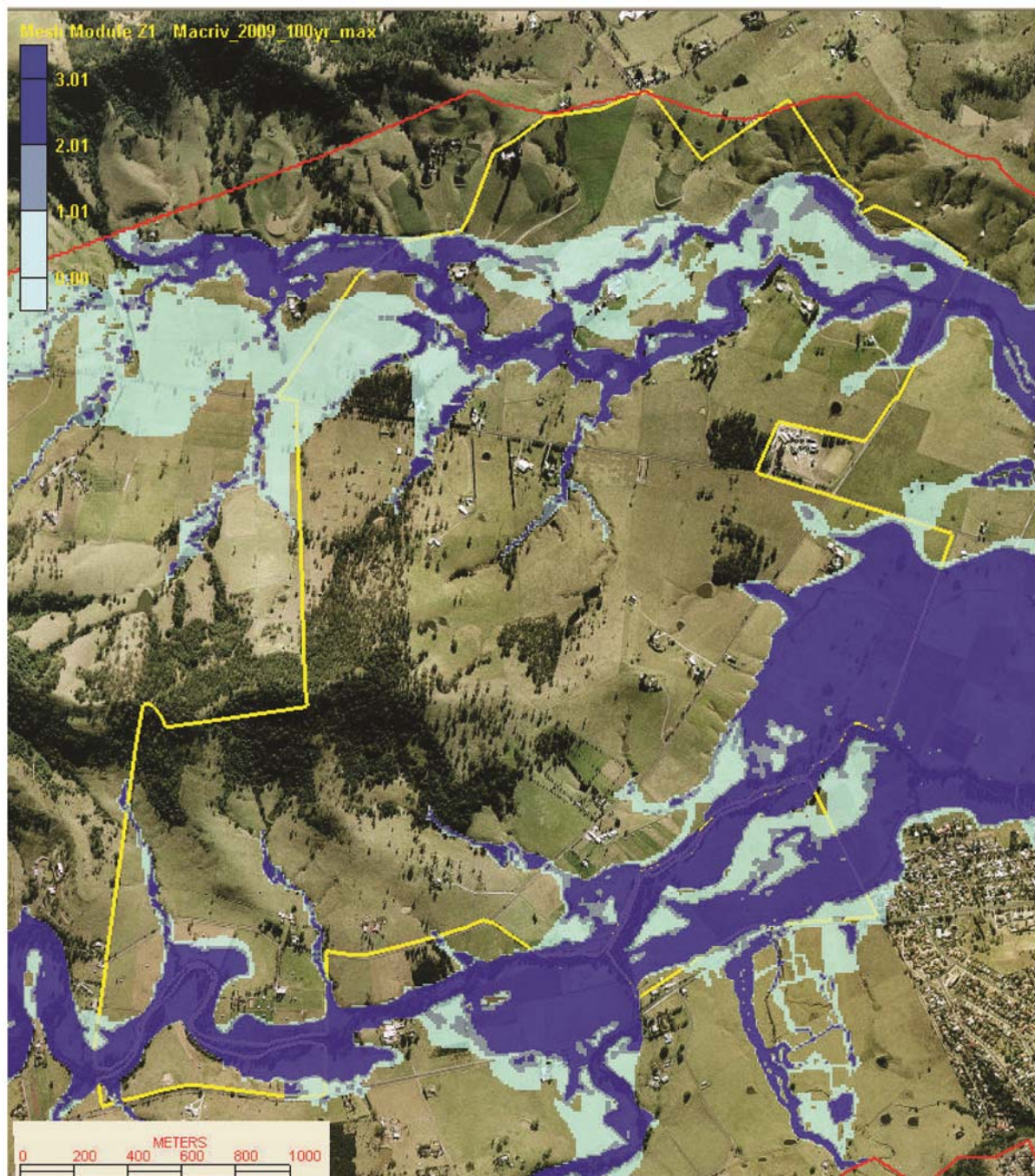


Figure 26 – Existing 1% Provisional Hydraulic Hazard (Source: Flood Study, Reinco, 2010)

3.13 Groundwater

A Groundwater Assessment prepared by Douglas Partners is included at **Appendix S**.

There are three existing groundwater regimes in and around the site:

- A series of discontinuous shallow groundwater aquifers located on slopes and ridgelines surrounding the site. This groundwater is perched above the underlying rock profile and sourced from direct rainfall onto surface soils. The high clay content of sub-soils at the site means that aquifer recharge and discharge rates are typically slow.
- A much more extensive groundwater aquifer system adjoining each of the main watercourses of Marshall Mount Creek and Macquarie Rivulet. These aquifers are perched above underlying rock profiles and are contained within a relatively loose and variable matrix of alluvial soils. They are maintained by a combination of direct rainfall, inflows from shallow slope based groundwater systems and recharge during high flows in the adjoining watercourse during flood. Long term groundwater surface profiles in these systems will vary according to seasonal changes in rainfall patterns however groundwater is likely to be encountered within a few metres of the surface.
- A more extensive groundwater aquifer is known to occur downstream of the site near the broad floodplain junction between Macquarie Rivulet and Marshall Mount Creek. This aquifer extends through to Lake Illawarra, and is generally contained within a thin sand layer deposited on the floodplain.

As a result of clearing and intensive dairy grazing, there are no extensive groundwater dependent natural ecosystems located on the flood plain. There are also no extensive agricultural demands for groundwater extraction (eg large scale irrigation schemes). However, it is possible there is some isolated demand for stock watering associated with the existing rural homesteads.

As with most Illawarra streams, groundwater storage provides an important natural source of baseflow to the perennial streams adjoining the site, particularly during drought.

Groundwater levels within the shallow unconfined aquifers present in the alluvial deposits surrounding Marshall Mount Creek and Macquarie Rivulet are in the range of 2.5 – 4.5 metres below ground surface.

Perched aquifers on the hill sides of Johnston's Spur associated with the ephemeral creek lines are not considered to contain a significant groundwater resource due to the expected low hydraulic conductivity of the residual soils.

Groundwater is not a significant constraint to development across the majority of the site above RL20. Below RL 20, groundwater may present itself as a moderate constraint due to its proximity to the ground surface.

3.14 Access and Transport

A Transport Accessibility Study and Transport Management and Accessibility Plan (TMAP) prepared by Cardno is included at **Appendix T**.

Calderwood is an extension to the existing urban footprint. Its location presents a number of issues to work through when considering transport accessibility. The key issues include:

- An existing internal road network developed for low-demand, rural traffic and unsuitable for urban traffic.
- A regional road network which presently experiences peak period congestion at key intersections and mid-block sections, e.g. Princes Highway/Illawarra Highway intersection.
- A region with an existing high level of car dependence due to poorly integrated public transport, low service levels, irregular low-density urban development and dispersed trip origins and destinations.
- Significant urban development planned at nearby Tullimbar, Tallawarra, Yallah/Marshall Mount and West Dapto.

Functional road classifications

The existing functional road classifications in the Calderwood area are illustrated by **Figure 27**.

Key elements of the existing road network are:

- The Southern (F6) Freeway is located to the north east of the development site, running north-south. The Freeway assumes the role of providing for through traffic between Sydney, Wollongong and points further south, bypassing the Princes Highway and Dapto Town Centre.
- The Princes Highway, formerly part of the main inter-regional route between Sydney, Wollongong and points further south, now functions as a sub arterial route serving Dapto Town Centre and linking directly to the southern end of the Southern Freeway at Illawarra.
- The Southern Freeway and Princes Highway form the dominant freight route through the region, linking Port Kembla and Sydney with the Shoalhaven and South Coast Regions.
- Illawarra Highway located to the south and east of the development site is a major highway linking the Illawarra to Macquarie Pass.
- Marshall Mount Road forms the north and north western boundary of the site linking Huntley Road at the rail overpass with Calderwood Road.
- Yallah Road is a two-lane undivided carriageway linking Princes Highway with Marshall Mount Road.
- The site includes part of Calderwood Road and North Macquarie Road, both two lane undivided carriageways. Calderwood Road is 6 metres wide. North Macquarie Road is generally 4-5 metres in width, linking Illawarra Highway with Calderwood Road along the northern side of Macquarie Rivulet. It narrows to one lane at the immediate southern approach to Macquarie Rivulet is only one-lane wide.

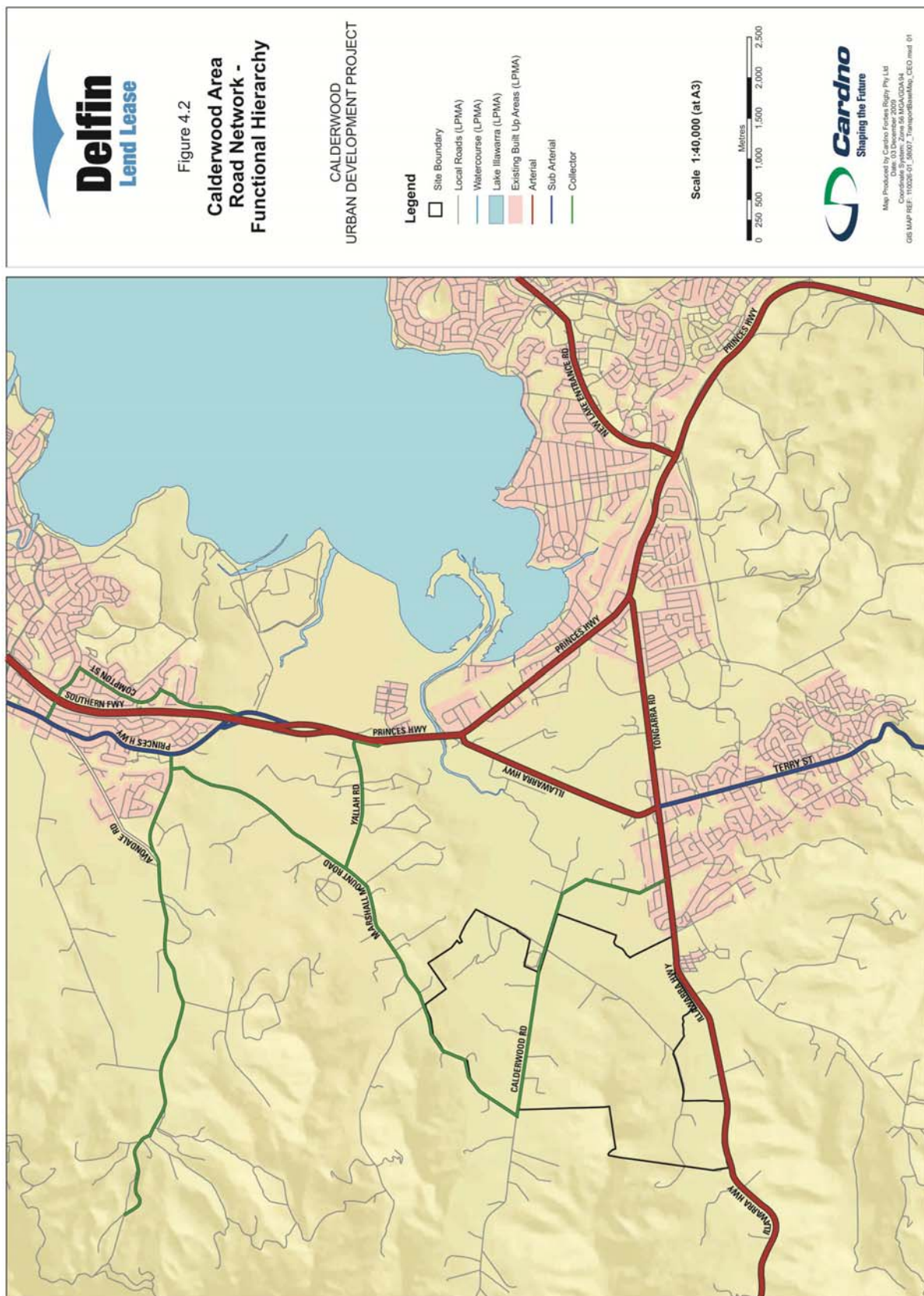


Figure 27 – Existing functional road classification (Source: Transport and Accessibility Study TMAP, Cardno, 2010)

Existing road network performance

The existing road network performance (midblock and intersection) in the AM and PM peak periods is illustrated at **Figures 28 and 29**.

The existing transport network contains a number of deficiencies which limit the level of service provided to existing peak period traffic. These include:

Mid-block performance

- Illawarra Highway northbound approaching Princes Highway operates at LoS C (stable flows, acceptable delays) during the AM Peak.
- Southern Freeway north of Princes Highway operates at LoS C in the peak direction during both peaks.
- Princes Highway southbound, southeast of Illawarra Highway operates at LoS C during the PM Peak.
- Princes Highway southbound, between Yallah Road and Illawarra Highway, operates at LoS F (forced flow, jammed) during the PM Peak.

Intersection performance

- The intersection of Illawarra Highway, Tongarra Road and Terry Street operates at LoS C during the AM Peak, with right turning movement from the northern approach, operating at the LoS D (approaching unstable flow, tolerable delays) and average delay of approximately 43 seconds.
- The intersection of Princes Highway and Illawarra Highway operates at LoS F during the AM Peak period.
- The intersection of Princes Highway and Tongarra Road generally operates well with an average LoS B however; the right turning movements at this intersection are operating close to capacity (LoS D) in the peak periods.
- The intersection of Princes Highway and Huntley Road operates at LoS C in the AM Peak and PM Peaks.

Rural Roads

The existing rural roads within the study area are generally adequate for present traffic volumes, with some exceptions:

- North Macquarie Road is not wide enough for two vehicles to pass in some sections, including the ford across Macquarie Rivulet, and the pavement is in poor condition in some sections.
- Marshall Mount Road has a section of very poor pavement between Calderwood Road and Marshall Mount Creek.
- Marshall Mount Road has a single-lane bridge and a narrow two-lane bridge across a branch of Duck Creek.
- The intersection of Illawarra Highway and North Macquarie Road has inadequate sight distance of vehicles approaching from the west due to a curve and dip in the road.
- The intersection of Illawarra Highway and Yellow Rock Road currently has inadequate sight distance of vehicles approaching from the west due to the vertical crest on approach to the bridge over Yellow Rock Creek.

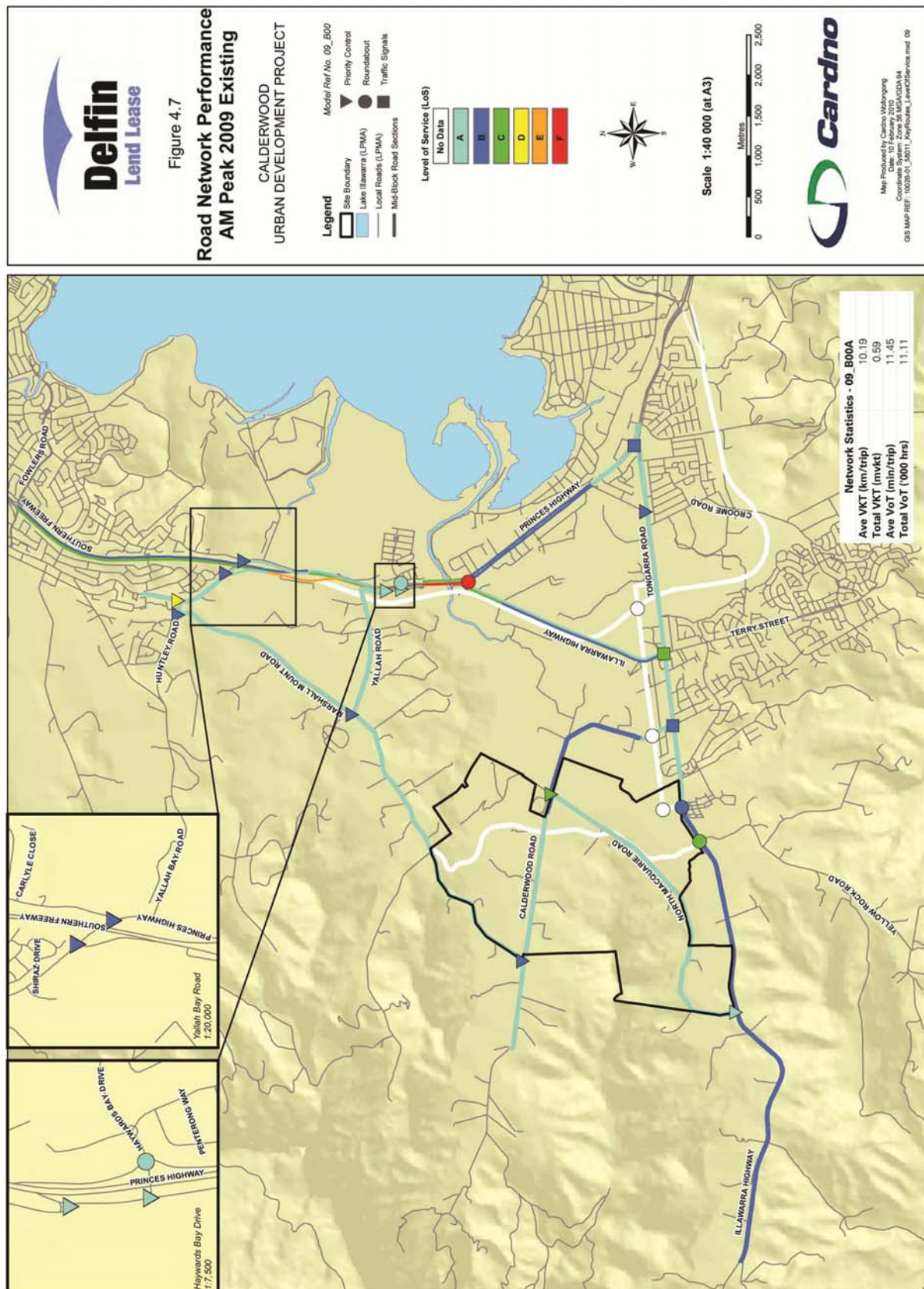


Figure 28 – Road network performance AM Peak 2009 existing (Source: Transport and Accessibility & TMAP, Cardno, 2010)

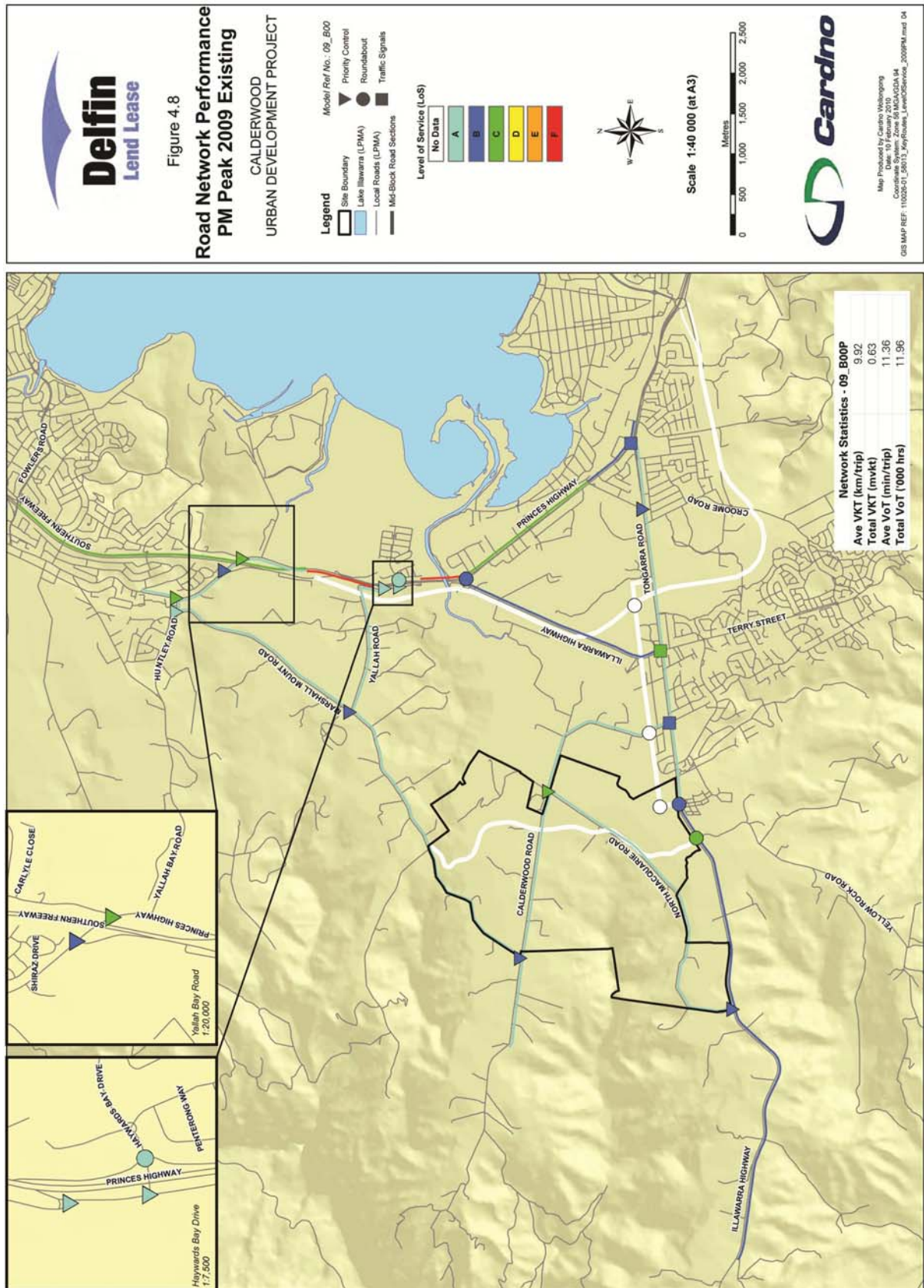


Figure 29 – Road network performance PM Peak 2009 existing (Source: Transport and Accessibility Study & TMAP, Cardno, 2010)

Existing public and active transport deficiencies

There is currently a high level of movement of workforce to jobs into, out of, within and between the Wollongong and Shellharbour LGAs. Car is the predominant mode of travel for work trips for both origin and destination trips within both LGAs, as well as within the local Calderwood area. The remaining modes contain very small percentages compared to the car mode.

The existing transport network contains a number of deficiencies which require management to increase the use of public transport:

- As the development site is presently rural land, no regular public bus services are provided.
- Bus routes serving nearby urban areas such as Dapto and Albion Park are generally poorly patronised. Routes are typically circuitous and indirect with generally only one bus per hour provided on each route.
- Bus and rail services operate mostly as segregated systems. The low and irregular service frequency of both bus and rail services is an impediment to encouraging transfers and their integration as part of a public transport network. The absence of an integrated fare structure is also a strong discouragement to integrating bus and rail services.
- Urban development is generally located distant from railway stations so the rail line is generally not used for local journeys. It functions mainly as a commuter service to Wollongong and Sydney.
- The large car dependency arises from the lack of public transport facilities available in the local area, and the nature and distance of the trips.

The existing bus network is shown on **Figure 30**.

There are presently no pedestrian or cyclist facilities provided within the development site as it is presently rural land.

Mansons Bridge on Calderwood Road makes no provision for pedestrians and there is limited sight distance at its southern end which makes it difficult for pedestrians to use the roadway.

Key transport opportunities include:

- An opportunity to create a master planned community with key sustainable transport principles included within its planning and design from the outset.
- The planning of a regional road network sufficient to resolve the currently experienced significant peak period congestion at key intersections and mid-block sections, e.g. Princes Highway/Illawarra Highway intersection.
- The progressive upgrading of the existing low-demand, rural local road network to provide road capable of providing an acceptable condition with safe and efficient operation to benefit all road users within the local and strategic context.
- The opportunity to remove the high car dependence due to the regions current poorly integrated public transport, low service levels, irregular low density urban development and dispersed trip origins and destinations.
- An ultimate transport network suitable to accommodate other significant urban development planned at nearby Tallawarra, Yallah/Marshall Mount and West Dapto.

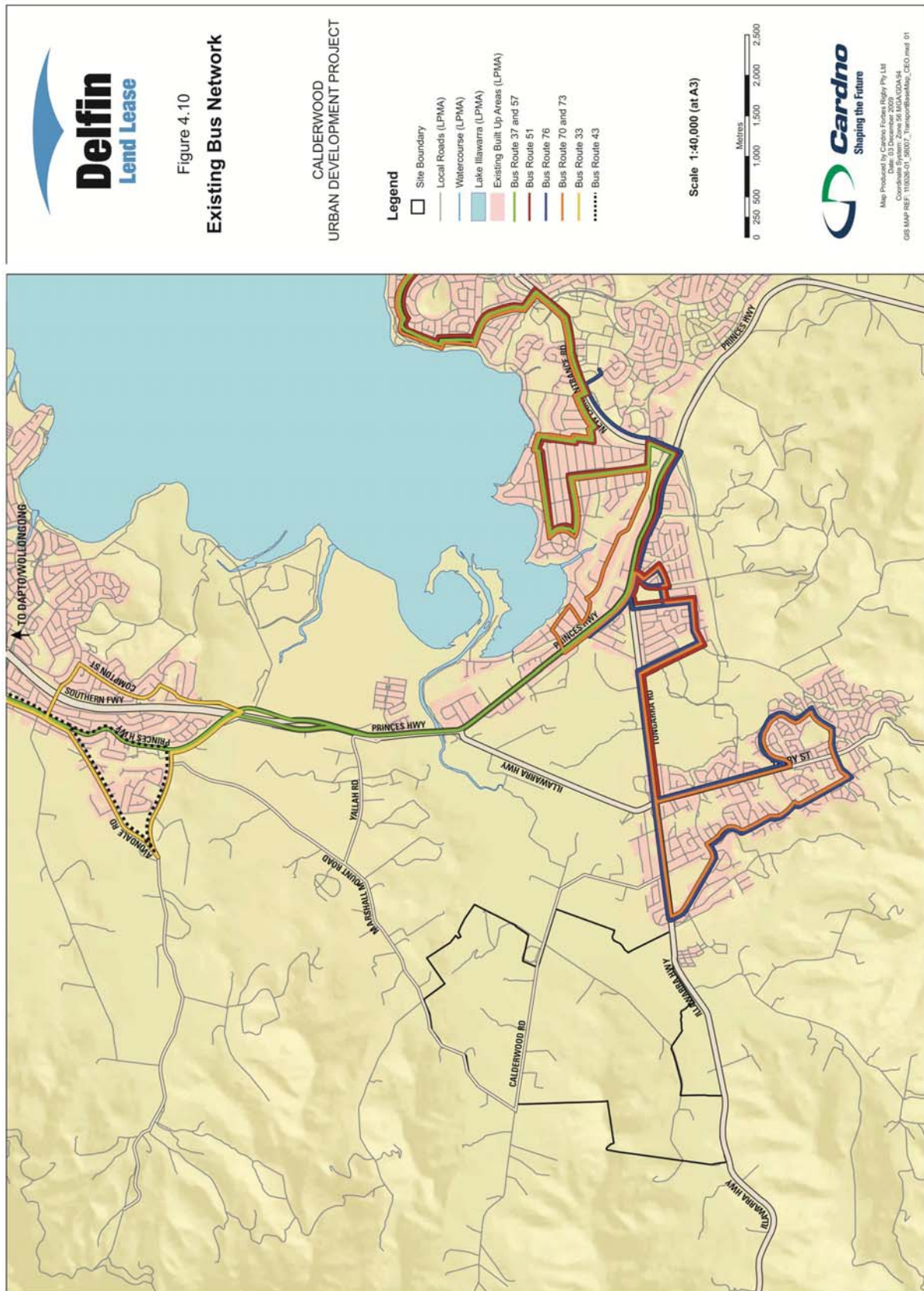


Figure 30 – Existing bus network (Source: Transport and Accessibility Study and TMAP, Cardno, 2010)

3.15 European Heritage

Built heritage

There are two heritage items within the site – Marshall Mount House and Barn c. late 1830s (Lot 2 DP 2543, Marshall Mount Road), and the Marshall Mount Methodist Cemetery (Lot 1 DP 195342, Calderwood Road).

Marshall Mount House and Marshall Mount Barn are included as a regional item under Schedule 1 of Wollongong LEP 1990 and Marshall Mount Methodist Cemetery as a local item under Shellharbour Rural LEP 2004.

Neither local heritage item is included on the National Heritage List under the EPBCA, nor on the NSW State Heritage Register.

Marshall Mount House and Barn is a registered place in the Register of the National Estate (RNE). The RNE is a non statutory listing.

Detailed physical descriptions of the items and copies of the inventory sheets for each of the heritage listings are included at Section 11 of the Heritage Impact Statement (HIS) prepared by Paul Davies Pty Ltd Architects Heritage Consultants included at **Appendix U**.

The location of existing European heritage items is shown on **Figure 31**.

Photographs of the items are included at **Figure 32** and **33**. A detailed physical description of Marshall Mount House and Barn (including its settings and views) and the Marshall Mount Methodist Cemetery, and assessment of their significance is provided in the HIS.

Marshall Mount House and Barn is identified as a mid nineteenth century estate house dating from the early opening up and development of the area, being one of the most important houses of its time in the Illawarra and significant for its close connection with Henry Osborne, an important early NSW pastoralist, landowner and NSW MLA. The current rural landscape around the house reflects over 160 years of European pastoral land management in the area and reflects the house's historic function as a farm residence.

The house itself is a very intact, unusually presented and interestingly designed early Colonial residence, consisting of two dramatically different sections reflecting the changing aspirations of the original owner. The place, including the house, garden and barn have high potential for significant archaeological remains with high research value.

The HIS identifies the Marshall Mount Methodist Cemetery to be significant as a 19th century cemetery that was established to cater for the Methodist community of the district and dating from the boom period of the locality. The remains of many well known district pioneers and their families are interred in the cemetery, which has a special association with former Mayor Thomas Armstrong, who donated land for the church and cemetery. The cemetery has aesthetic significance for the varied styles and craftsmanship of monumental masonry and social significance as evidence of Victorian and 20th century burial customs and genealogical data. It also has potential to yield archaeological data including additional burial sites.