

Chapter 1: Introduction

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1. Introduction

Energy Pacific (Vic) Pty Ltd, a wholly owned subsidiary of Pacific Hydro Pty Ltd (and hereafter referred to as “Pacific Hydro”) has submitted a Development Application to the Department of Planning, Transport and Infrastructure (DPTI) for lodgement to the Development Assessment Commission (DAC), for the construction and operation of a Wind Farm at Keyneton, South Australia. The wind farm will comprise up to 42 wind turbines with an estimated capacity of 105MW and is estimated to generate electricity for 25 – 30 years.

The application is being made in accordance with Section 49 of the *Development Act 1993* (the “Act”). Pursuant to Section 49, DPTI (formerly the Department for Transport, Energy and Infrastructure) will support and endorse the development of the Keyneton Wind Farm as a development of *public infrastructure*. Pacific Hydro has prepared this application for the proposed Keyneton Wind Farm for lodgement by DPTI with the DAC.

This document contains information supporting the Development Application and includes a full project description (Chapter 3) and an assessment of the potential environmental effects associated with the proposal (Chapters 6-11). Independent technical reports by specialist consultants on flora and fauna, landscape and visual effects, cultural heritage, noise and assessment against the Mid Murray Development Plan are provided as Appendix A to G.

1.1 The Applicant

Pacific Hydro undertakes its wind farm development projects in Australia through a wholly-owned subsidiary, Energy Pacific (Vic) Pty Ltd. The Development Application, supported by this Report, is thus made in the name of Energy Pacific (Vic) Pty Ltd.

1.2 Pacific Hydro

Pacific Hydro is a leading renewable energy company, producing clean power from natural resources. For nearly 20 years, we have lived our vision – powering a cleaner world – by identifying, delivering and operating clean energy projects and providing carbon abatement products and services to our customers across the globe.

With hydro, wind, solar and geothermal power projects at varying stages of development, construction and operation in Australia, Brazil and Chile, we continue to provide strong returns for the environment, local communities and investors.

Founded in Australia in 1992, Pacific Hydro has approximately 453 MW of operating assets, which includes 52 MW of Australia/Pacific hydro operations; 141 MW of international hydro operations; 200 MW of Australia/Pacific wind energy projects and 58 MW wind energy projects in Latin America.

Pacific Hydro is a wholly owned subsidiary of the Industry Funds Management (IFM) Australian Infrastructure Fund. Through its ownership structure, Pacific Hydro provides sustainable infrastructure investment opportunities for around 5 million Australian members of Industry Superannuation Funds.

Vision, Mission & Values

Our Vision

Powering a cleaner world.

Our Mission

To produce electricity profitably through the innovative commercialisation of clean energy resources.

Our Leading Values

Leadership: having the courage to lead and innovate.

Energy: helping to meet the world's energy needs while making a positive and lasting difference to the environment.

Action: achieving our goals by working together, with integrity and an entrepreneurial spirit.

Dedication: we are dedicated to ensuring a healthy and safe environment for our employees, the sustainability of our business and positive outcomes for our communities.

If approved, the Keyneton Wind Farm will form an integral part of Pacific Hydro's growing renewable energy portfolio.

1.3 Development Application Process

Section 49 of the Act provides a process for determining Crown Development and Public Infrastructure developments. The Act, and in particular Section 49 (1), defines the terms *public infrastructure* and *State agency*, as follows (only relevant provisions listed):

Public infrastructure means-

- (a) *the infrastructure, equipment, structures, works and other facilities used in or in connection with the supply of water or electricity, gas or other forms of energy, or the drainage or treatment of waste water or sewerage;*

State agency means-

- (b) *an agency or instrumentality of the Crown (including a Department or administrative unit of the State);*

DPTI (formerly DTEI) are considered to be a *State agency* for the purposes of Section 49 (1).
Section 49 (2)(c) of the Act provides:

Subject to this section, if-

- (c) *a person proposes to undertake development initiated or supported by a State agency for the purposes of the provision of public infrastructure and specifically endorsed by the State agency for the purposes of this section,*

the State agency must lodge an application for approval containing prescribed particulars with the Development Assessment Commission.

This Section of the Act enables any person, subject to the State agency endorsement of the public infrastructure project, to propose an application pursuant to the Section 49 planning process, provided that the State agency becomes the applicant.

1.4 Site Location

The proposed wind farm site is located entirely on private agricultural land along the ridgeline of the Eastern Mount Lofty Ranges, approximately 6km north-west of Cambrai, 8km west of Sedan, 4km east of Keyneton and 8km east of Eden Valley. The site is approximately 70km north-east of Adelaide. The linear site runs north to south along the Mount Lofty Ranges for approximately 16km. Figure 1.1 shows the general site location. The proposed turbine layout is shown in Figures 1.2 and 1.3.

1.4.1 Land Titles

This application is being made for allotments or land parcels within the following nine land titles as detailed in the following table (See also Figure 1.4):

Table 1.1: Land Title Details

Title Reference Volume/ Folio	Land plan and parcel details on title	Land parcels within wind farm site boundary
CT 5370/ 673	Allotments 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 118, 119, 120, 121, 122, 123, 124, 125, 126 and 130 Filed Plan 174436 In the area named Keyneton Hundreds of Jellicoe and Moorooroo Allotments comprising pieces 116, 117, 127, 128 & 129 Filed Plan 174436 In the areas named Keyneton and Moculta Hundreds of Jellicoe and Moorooroo Pieces 116 and 117 form one allotment Pieces 127, 128 and 129 form one allotment	Allotments 101, 102, 103, 106, 107, 108, 109 Filed Plan 174436 In the area named Keyneton Hundreds of Jellicoe and Moorooroo
CT 5910/ 35 CT 5910/ 35 (cont.)	Section 158 Hundred of Jellicoe In the area named Towitta Sections 346, 355, 645, 662, 663, 664, 669, 670, 677 and 824 Hundred of Jellicoe In the area named Keyneton	Sections 662, 663, 664, 669, 670 Hundred of Jellicoe In the area named Keyneton

	<p>Allotment 101 Deposited Plan 18000 In the area named Keyneton Hundred of Jellicoe</p> <p>Allotment 200 Deposited Plan 21149 In the area named Keyneton Hundred of Jellicoe</p> <p>Allotments 109, 112, 113, 114, 115, 116, 117, 118 & 119 Filed Plan 35437 In the area named Keyneton Hundred of Jellicoe</p> <p>Allotment comprising pieces 120, 121, 122 & 123 Filed Plan 35437 In the areas named Keyneton and Towitta Hundred of Jellicoe</p> <p>Allotment comprising pieces 31 and 32 Filed Plan 161156 In the area named Keyneton Hundred of Jellicoe</p> <p>Allotment 33 Filed Plan 161157 In the area named Keyneton Hundred of Jellicoe</p> <p>Allotment comprising pieces 34 and 35 Filed Plan 161157 In the area named Keyneton Hundred of Jellicoe</p>	<p>Allotment 200 Deposited Plan 21149 In the area named Keyneton Hundred of Jellicoe</p> <p>Allotments 114, 115, 116, 117 Filed Plan 35437 In the area named Keyneton Hundred of Jellicoe</p>
CT 5203/ 997	<p>Sections 552, 557, 564 Hundred of Jellicoe In the area named Keyneton</p> <p>Sections 657 and 658 Hundred of Jellicoe In the areas named Keyneton & Mount McKenzie</p> <p>Sections 788, 789, 790 and 799</p>	<p>Sections 552, 557, 564 In the area named Keyneton Hundred of Jellicoe</p> <p>Sections 657 & 658 Hundred of Jellicoe In the area named Keyneton & Mount McKenzie</p> <p>Sections 788, 789, 790 and 799</p>

	<p>Hundred of Jellicoe In the area named Keyneton</p> <p>Allotment 6 Deposited Plan 21151 In the area named Keyneton Hundred of Jellicoe</p> <p>Allotments 7 Deposited Plan 21151 In the area named Sedan Hundred of Jellicoe</p> <p>Allotments 2 and 3 Filed Plan 103977 In the area named Mount McKenzie Hundred of Jellicoe</p>	<p>In the area named Keyneton Hundred of Jellicoe</p> <p>Allotments 2 and 3 Filed Plan 103977 In the area named Mount McKenzie Hundred of Jellicoe</p>
CT 5620/ 53	<p>Allotments 117, 118 and 119 Filed Plan 216418 In the area named Mount McKenzie Hundred of Jellicoe</p> <p>Allotments 120, 121, 122 and 123 Filed Plan 216418 In the area named Keyneton Hundred of Jellicoe</p>	<p>Allotments 117, 118 and 119 Filed Plan 216418 In the area named Mount McKenzie Hundred of Jellicoe</p> <p>Allotments 120, 121, 122 and 123 Filed Plan 216418 In the area named Keyneton Hundred of Jellicoe</p>
CT 5547/ 432	<p>Allotment 254 Filed Plan 170003 In the area named Mount McKenzie Hundred of Jellicoe</p>	<p>Allotment 254 Filed Plan 170003 In the area named Mount McKenzie Hundred of Jellicoe</p>
CT 6093/ 980	<p>Allotment 1000 Deposited Plan 12383 In the area named Cambrai Hundreds of Angas and Jellicoe and Jutland</p>	<p>Allotment 1000 Deposited Plan 12383 In the area named Cambrai Hundreds of Angas and Jellicoe and Jutland</p>
CT 5535/ 664	<p>Allotment 2 Deposited Plan 27990 In the area named Eden Valley Hundred of Jutland</p>	<p>Allotment 2 Deposited Plan 27990 In the area named Eden Valley Hundred of Jutland</p>
CT 5478/ 641	<p>Blocks 8 and 467 Hundred of Jutland</p>	<p>Block 467 Hundred of Jutland</p>

	In the area named Eden Valley	In the area named Eden Valley
CT 5739/ 389	Allotment 9 Deposited Plan 3806 In the area named Cambrai Hundreds of Angas and Jellicoe and Jutland	Allotment 9 Deposited Plan 3806 In the area named Cambrai Hundreds of Angas and Jellicoe and Jutland

1.5 Development Details

This application is being made for the construction and operation of a wind farm including the following:

- 42 wind turbines comprising:
- Tapered cylindrical tubular towers
- Three blades
- Maximum tip height of 145.5m
- Turbine foundation (approximate 6m diameter at surface, 14m diameter sub-surface)
- Adjacent hardstand at each turbine (with an area of up to 1700m²)
- External electrical transformer (approximate 4m length x 2m width x 2m height) at the base of each turbine
- Approximately 45 km of on-site access tracks
- Approximately 42 km of underground cabling, predominantly adjacent to access tracks
- One on-site electrical substation (within an approximate 2.3 hectare compound with approximate dimensions of 285m x 80m)
- Three (3) permanent meteorological masts of up to hub height
- Five (5) temporary meteorological masts between 80m and hub height
- Three temporary construction compounds (approximately 50m x 50m)
- Approximately 6.1km overhead transmission line on 20-25 m high poles to connect the northern and southern clusters (wholly contained on-site).

The application is being made for a turbine with a maximum height to tip of 145.5m. This approach allows Pacific Hydro to consider a range of manufacturers during the tender process. For some assessments however it is necessary to state the actual turbine dimensions and in some cases (noise) a particular turbine model has to be used in order that specific data can be referenced. The landscape and visual, noise and shadow flicker assessments provide the turbine dimensions used within those assessments.

The proposed site infrastructure is shown on Figures 1.2 and 1.3. A detailed description of the proposed project infrastructure is provided in Chapter 3. Figures 3.1 to 3.6 provide indicative elevations and layouts for turbines, access tracks, substation/switching yard and meteorological masts. The estimated capacity of the wind farm will be 105 MW, and the total project costs are estimated to be approximately \$242 million.

The wind farm will connect to the National Electricity Grid by direct connection to the existing 275kV line which passes through the site. There is therefore no requirement for any offsite overhead transmission line or associated electrical infrastructure.

1.6 Site Details

The site covers a total area of 5,256 hectares, of which only 48 hectares (less than 1% of the land) will be used in the final project footprint. The site comprises cleared agricultural land primarily used for cropping and livestock grazing.

1.7 Development Application

1.7.1 Application Form

A copy of the completed Section 49 - Crown Development Application Form is provided at the front of this document along with copies of the site's land titles.

1.7.2 Timescales

Large infrastructure projects such as Keyneton Wind Farm necessarily require long development timescales. The applicant therefore requests that the Development Plan Consent is granted for a period of four years to substantially commence construction in order to allow time to complete all the technical, planning and commercial works required. The timetable below provides an approximate indication of the works and associated timescales estimated for the Keyneton Wind Farm if approved.

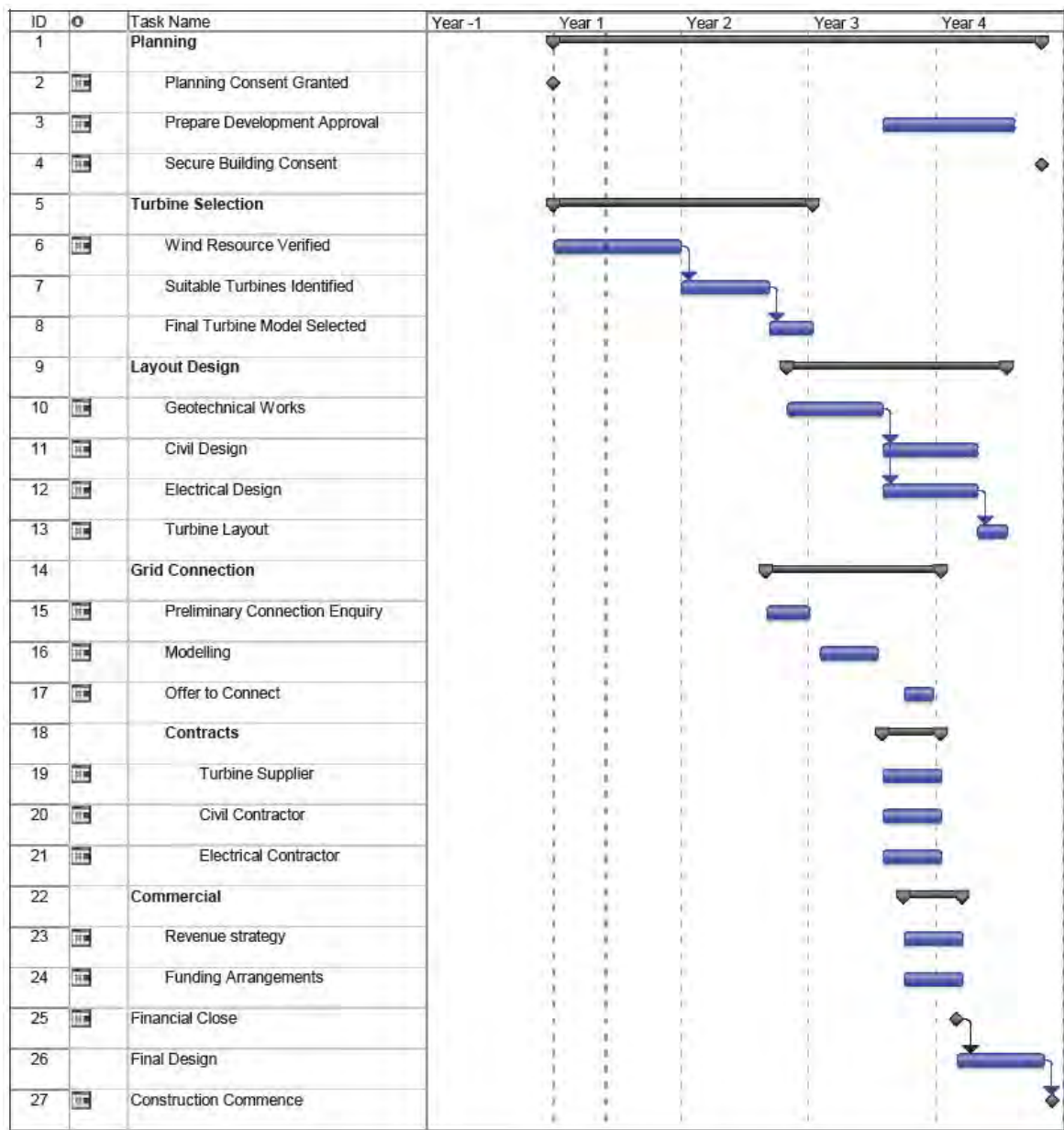


Chart 1.1: Estimated development timescale till construction

From the substantial commencement of construction, the timeframe then estimated for the completion of construction is 2 years. Further detail regarding the staging of construction is provided in Section 3.4.2.

1.7.3 Application Report

This report has been prepared to support a Development Application.

This report covers the site selection, the proposed layout, design investigations, environmental assessments, access and construction and proposed environmental management mitigations and monitoring protocols. This Development Application is consistent with the approach recommended by Planning SA in the *Guide for Applicants: Wind Farms 2002*, the requirements of the Act and the Mid Murray Development Plan. Relevant planning policy is provided in Chapter 13 and a detailed assessment against the provisions of the Mid Murray Development Plan completed by Nolan Rumsby Planners is included at Appendix A.

In addition the following information is provided within this report:

- **Chapter 2 Site Context and Design Response** – describes the site selection process, the surrounding land use practices, settlements and infrastructure and an overview of the wind farm design process.
- **Chapter 3 Project Description** - provides information relating to the proposed wind turbines, associated infrastructure, construction methods, traffic management and wind farm development phases.
- **Chapter 4 Policy and Project Benefits** – provides an overview of the project's environmental, social and economic benefits and a comprehensive assessment on the underpinning Federal and State policy rationale for the proposed Keyneton Wind Farm.
- **Chapter 5 Community Consultation and Project Evolution** – demonstrates Pacific Hydro's commitment to community consultation and engagement and provides an overview the consultation undertaken and project's evolution in response to community feedback.
- **Chapter 6 Flora and Fauna Assessment** – provides a summary of the potential impacts on all flora and fauna species present (or potentially present) on site. EBS Ecology's detailed assessments are provided as Appendix B, C and D.
- **Chapter 7 Landscape and Visual Impact Assessment** – provides an overview of the assessment of the character and visual quality of the site and the surroundings potentially affected by the proposal, visibility of the proposed wind farm and its landscape and visual impacts. Wax Design and Brett Grimm Landscape Architect's Landscape Character and Visual Assessment Report is provided as Appendix E.
- **Chapter 8 Cultural Heritage Assessment** – summarises the Aboriginal ethnographic and archaeological survey work undertaken to date on site as well as an assessment of European cultural heritage. Australian Cultural Heritage Management (ACHM)'s Cultural Heritage Assessment is provided as Appendix F.
- **Chapter 9 Noise Assessment** – summarises the results of the noise impact assessment. Vipac's Noise Impact Assessment is provided as Appendix G.
- **Chapter 10 Site Access and Traffic Management** – documents the proposed routes to the site, levels of traffic which will arise during project construction and operation and proposed road improvements and traffic mitigations.
- **Chapter 11 Other Matters** – assesses potential occurrence of electromagnetic interference (EMI), aircraft safety, shadow flicker and blade glint.
- **Chapter 12 Summary Mitigation Measures** – summarises the mitigation measures to be adopted within a series of Environmental Management and Monitoring Plans (EMMPs).

- **Chapter 13 Development Plan Assessment** – provides a summary of the assessment against the relevant provisions of the Mid Murray Development Plan. Nolan Rumsby Planners' assessment is provided as Appendix A.

1.7.4 Environmental and Planning Assessment

Development of the wind farm at Keyneton has the potential to give rise to a number of environmental effects. A number of environmental impact assessments have been carried out by the following independent technical specialists as reported within this document:

- Flora and Fauna Assessments – EBS Ecology
- Landscape and Visual Impact Assessment – Wax Design and Brett Grimm Landscape Architect (BGLA)
- Cultural Heritage Assessment – Australian Cultural Heritage Management (ACHM)
- Noise Impact Assessment – Vipac Engineers and Scientists Ltd
- Planning Report – Nolan Rumsby Planners

Each of the specialist technical assessments is provided in full as appendices within Volume 2 of this report. Chapters 6, 7, 8, 9 and 13 provide a brief summary of the assessments, however for specific and further details, the specialist reports should be referred to.

Each of the environmental assessment chapters (Chapters 6-9) follows a systematic approach to assessment, the principal steps of which are:

- **Methodology** - outlines the work undertaken during the assessment including all background research, consultation and field studies.
- **Baseline Description** – provides a description of the site pre development based on the findings of the desk based and field survey findings.
- **Assessment of Effects** - presentation of potential effects arising during each stage of development – construction, operation and decommissioning. Where appropriate the potential magnitude, likelihood of occurrence and overall significance of effects is assessed.
- **Mitigation and Environmental Management** – summary of embedded mitigation measures i.e. mitigation adopted during the design stage and mitigation measures to be adopted during construction, operation and decommissioning stages.

1.8 Principles of Development

Pacific Hydro applies the principles of sustainable development to all stages of the project development cycle as outlined within the Company's Health, Safety and Sustainability Policy¹. With respect to the principles of sustainable development, renewable energy is by its very nature a sustainable model for electricity production. With respect to future generations, world electricity consumption is projected to be 85% higher by 2030. Increasing the use of energy from renewable

¹ <http://pacifichydro.com/wp-content/uploads/2012/01/HSS-Policy-Jan-2012-English.pdf>

sources is therefore a vital component for reducing greenhouse emissions and associated climate change.

Pacific Hydro seeks to ensure that all its activities are carried out in accordance with the principles outlined in Section 1.2.

In addition to providing sustainable sources of electricity, Pacific Hydro also employs the following hierarchical, environmental principles during the design and construction phases of development. Firstly, local environment and amenity impacts will be avoided where possible; secondly, local environment and amenity impacts will be minimised (for example with use of appropriate management and mitigation techniques); and finally, these negative impacts will be mitigated wherever possible.

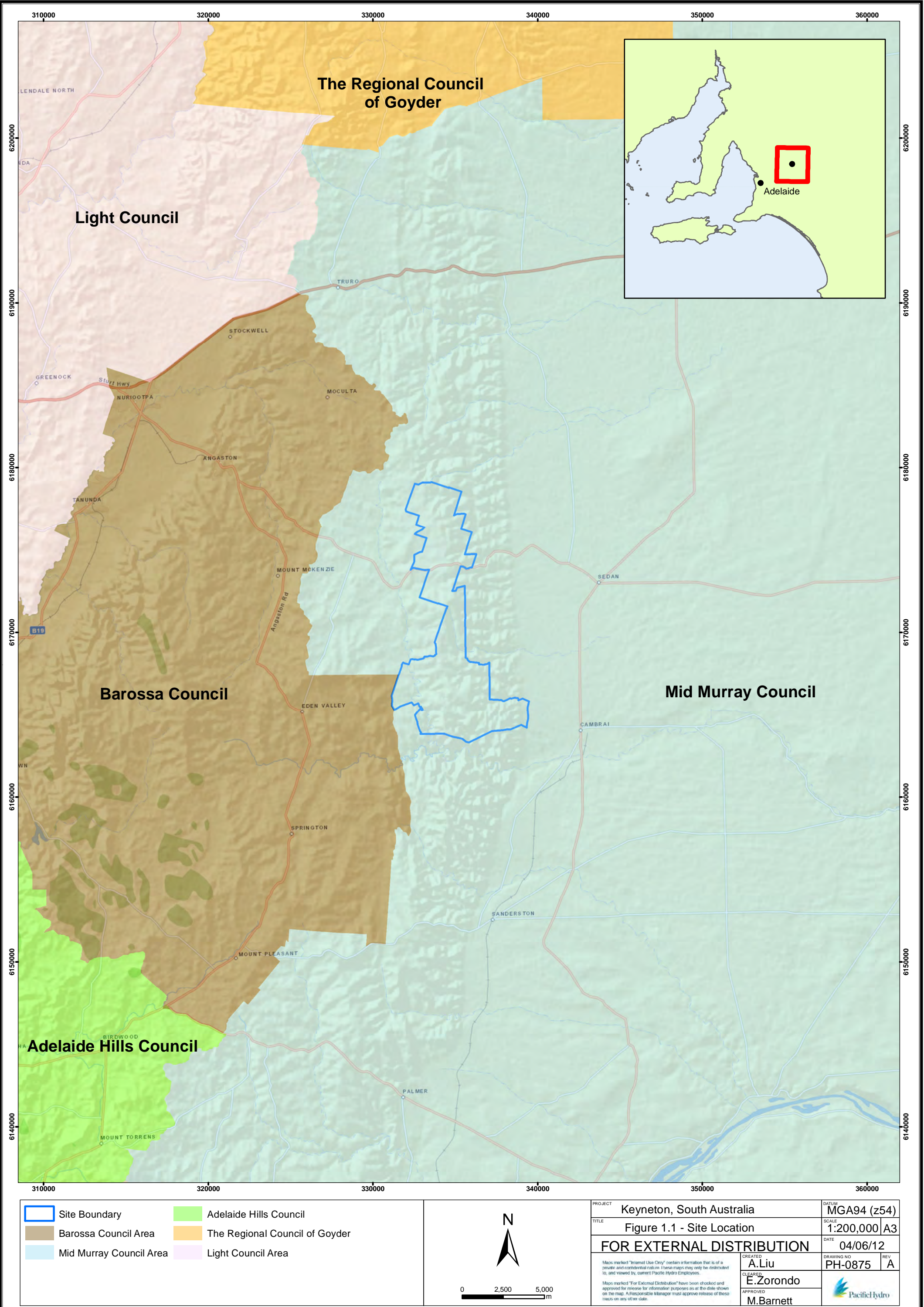
Chapter 1 Figures

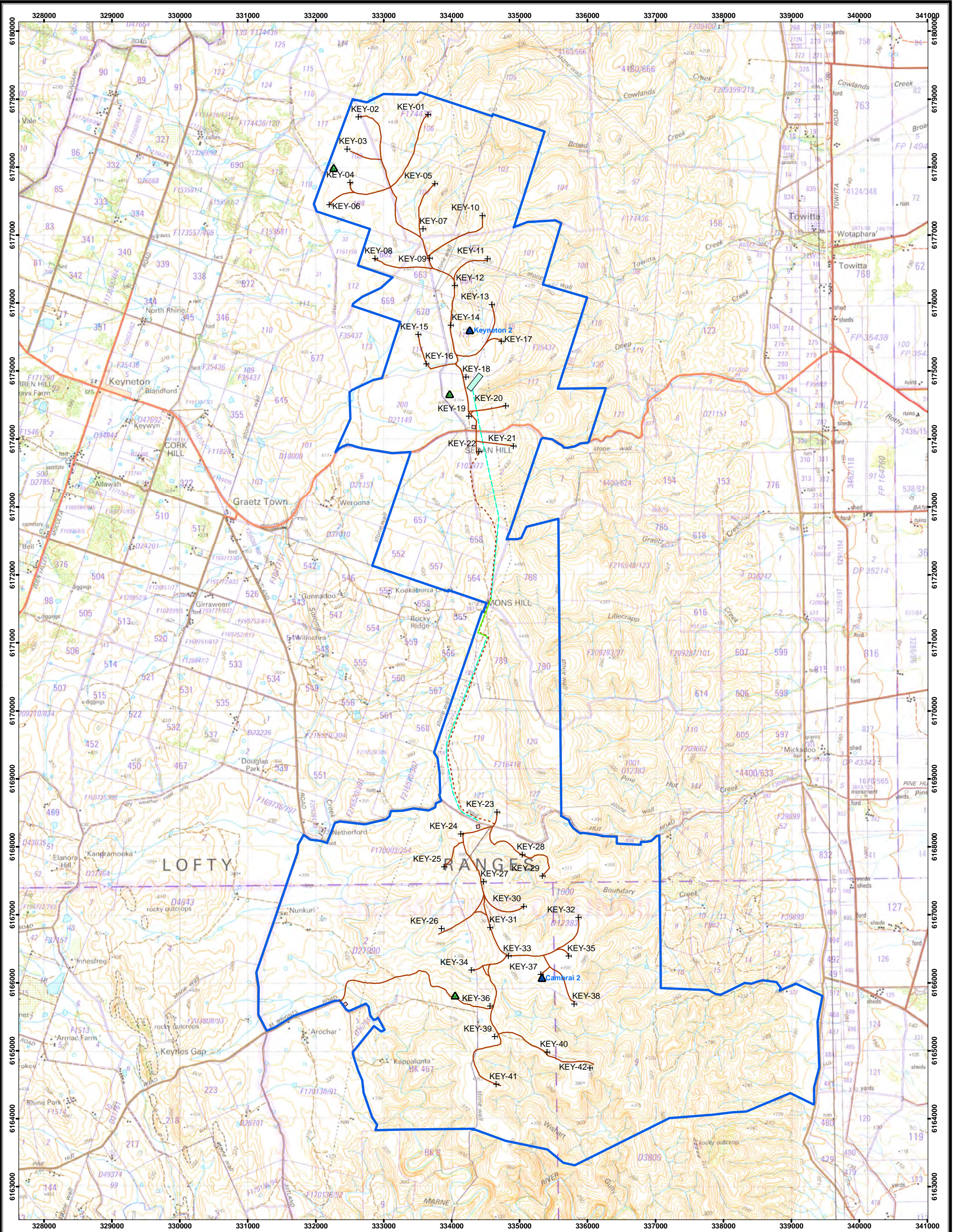
Figures 1.1: Site Location

Figures 1.2: Layout / Project Infrastructure (Topographical)

Figures 1.3: Layout / Project Infrastructure (Aerial)

Figures 1.4: Land Titles Details





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Proposed Turbine Layout (42 Turbines)*

Substation / Switching Yard

Site Boundary

Overhead Line

Underground Cable

Temporary Construction Compounds

Tracks

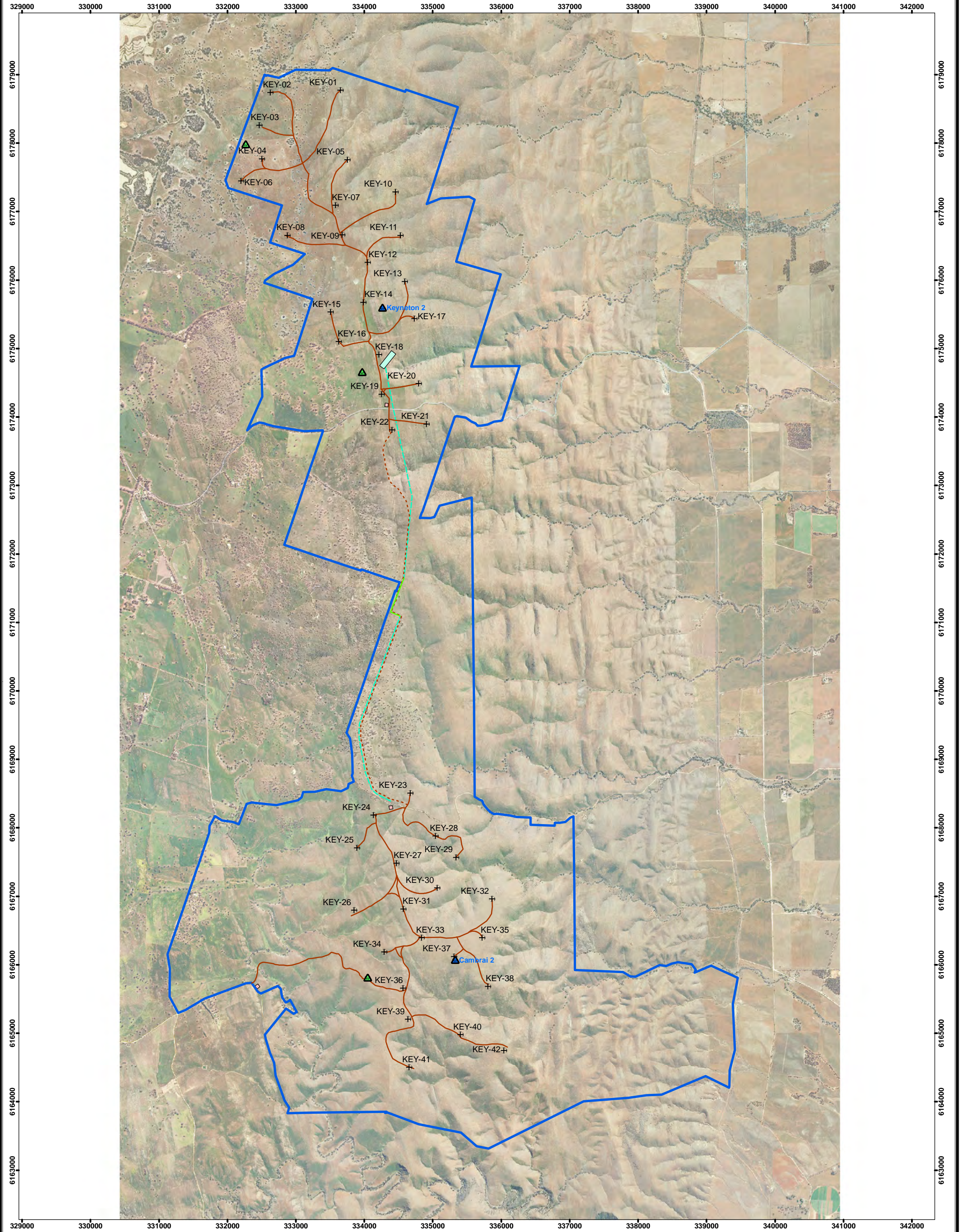
Main access

Secondary access

Masts

Existing 50m Monitoring Masts

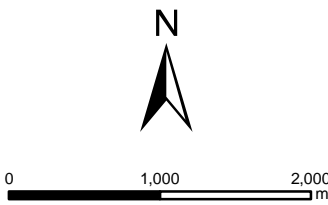
Proposed Permanent Masts
-
- | | | | | | |
|---------|--|---|--|------------|-------------|
| PROJECT | | Keyneton, South Australia | | DATUM | MGA94 (z54) |
| TITLE | | Figure 1.2 Site Layout - Topography | | SCALE | 1:50,000 A3 |
| | | FOR EXTERNAL DISTRIBUTION | | DATE | 04/06/12 |
| | | Map marked "Internal Use Only" contain information that is of a private and confidential nature. These maps may only be distributed to, and viewed by, current Pacific Hydro Employees. | | CREATED | A.Liu |
| | | Map marked "For External Distribution" have been checked and approved for release for information purposes as at the date shown on the map. A Responsible Manager must approve release of these maps on any other date. | | CHECKED | V.Vandale |
| | | | | APPROVED | M.Barnett |
| | | | | DRAWING NO | PH-0876 |
| | | | | REV | A |
- * Maximum tip height 145.5m




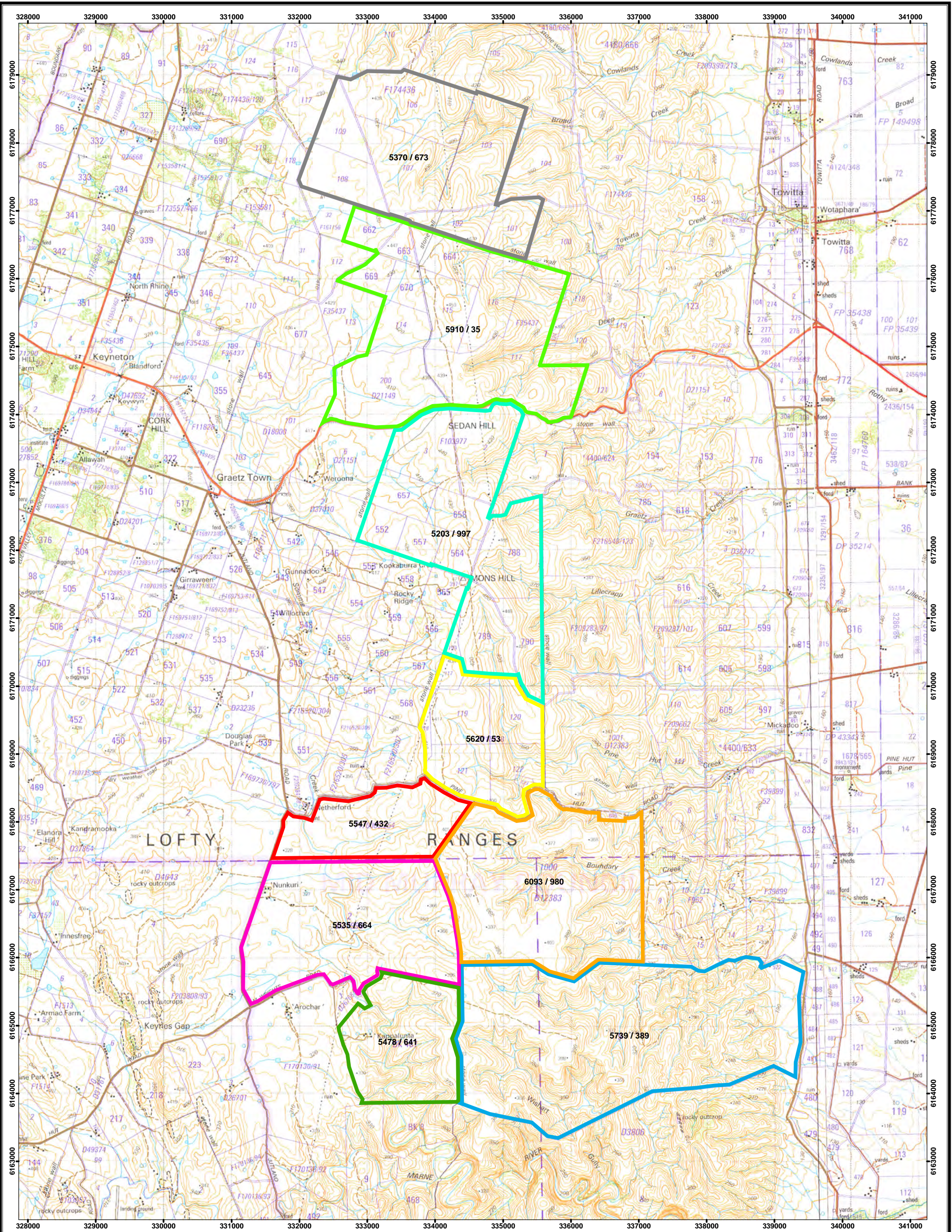
- Proposed Turbine Layout (42 Turbines)*
- Substation / Switching Yard
- Site Boundary
- Overhead Line
- Underground Cable
- Temporary Construction Compounds

- Tracks**
 - Main access
 - Secondary access
- Masts**
 - Existing 50m Monitoring Masts
 - Proposed Permanent Masts

* Maximum tip height 145.5m



PROJECT		Keyneton, South Australia		DATUM		MGA94 (z54)			
TITLE		Figure 1.3 Site Layout - Aerial		SCALE		1:50,000 A3			
FOR EXTERNAL DISTRIBUTION				DATE		04/06/12			
<p>Maps marked "Internal Use Only" contain information that is of a private and confidential nature. These maps may only be distributed to, and viewed by, current Pacific Hydro Employees.</p> <p>Maps marked "For External Distribution" have been checked and approved for release for information purposes as at the date shown on the map. A Responsible Manager must approve release of these maps on any other date.</p>				CREATED		DRAWING NO		REV	
				A.Liu		PH-0877		A	
				CLEARED					
V.Vandale									
				APPROVED					
				M.Barnett					



Land Titles (Volume/Folio Numbers)

- (5203/997)
- (5547/432)
- (5910/35)
- (5620/53)
- (6093/980)
- (5535/664)
- (5370/673)
- (5478/641)
- (5739/389)



0 1,000 2,000 m

PROJECT		Keyneton, South Australia		DATUM		MGA94 (z54)	
TITLE		Figure 1.4 Land Title Details		SCALE		1:50,000 A3	
		FOR EXTERNAL DISTRIBUTION		DATE		04/06/12	
		CREATED		A.Liu		DRAWING NO	
		CLEARED		E.Zorondo		PH-0878	
		APPROVED		M.Barnett		REV	
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Attachment 1.1

Health, Safety and Sustainability Policy



Health, Safety and Sustainability Policy

Pacific Hydro's mission is to produce electricity through the innovative commercialisation of clean energy resources. Achieving this mission requires us to develop, deliver and operate world-class clean energy assets in a sustainable way.

In delivering this mission we must comply with all applicable occupational health, safety and environmental laws and other Company commitments and aspire to cause "Zero Harm" to people, the environment and our host communities.

Our aims

To:

- Have zero illnesses, injuries and fatalities, harm to the environment and host communities occur as a result of or in connection with our business interests;
- Be an industry leader in the management of occupational health and safety, the environment and sustainable development, improving our credentials as an employer of choice; and
- Continue to generate electricity with zero greenhouse gas emissions to complement our pollution-prevention ethic.

How we will achieve this

Pacific Hydro will establish a culture and management system to ensure that:

- Objective and measurable health, safety, environmental and sustainability (HSS) performance indicators are set and met;
- Systematic processes of continuous improvement in HSS management and performance are followed;
- All directors, managers, employees, contractors and visitors are aware of the Company's aims for continuously improving HSS management and performance;
- Consistently safe, environmentally sound and sustainable practices are applied across our global operations;
- All practicable steps are taken to eliminate or control hazards and harmful aspects within operations under our control through the process of identification, risk assessment, implementation of controls and periodic continuous monitoring;
- Regular audits are conducted to measure, and where appropriate, improve the application of safe, environmentally sound and sustainable work practices;
- Educational, training, learning and communication systems around HSS are continually refined and developed;
- All incidents, non compliances and near misses are thoroughly investigated, with action taken to prevent recurrence;
- Consultation, communication and engagement are the cornerstones of our global HSS efforts;
- Land and resources under our care are managed with sensitivity, having due regard for cultural heritage, local conditions and concerns; and
- This policy is communicated to all persons working for or on behalf of the organisation and is readily available to the public.

Responsibility and Accountability under this Policy

- Pacific Hydro's Board or its delegate, the Health, Safety, People and Sustainability Committee, is accountable for ensuring sound systems of HSS management.
- The CEO is responsible for implementing appropriate management systems to ensure commitments made herein are met.
- All directors, managers, employees and contractors must adhere to the Policy and act in a way which continuously promotes positive HSS performance, including the education and encouragement of visitors' commitment to this policy.

Rob Grant
Chief Executive Officer

Version 1.1 Approved
Date: 17 January 2012