perisher

Statement of Environmental Effects

UPGRADE OF ELECTRICAL INFRASTRUCTURE, SMIGGIN HOLES

AUGUST 2011

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Document Verification

Project Title: Upgrade of Electrical Infrastructure, Smiggin Holes

Project Number: 1689

Project File Name: PSR – electrical upgrade final V2.0

Revision	Date	Prepared by (name)	Reviewed by (name)	Approved by (name)
Final V2.0	4/03/11	Jane McIntosh Paul McPherson Glenn Shaw	Nick Graham-Higgs	Nick Graham-Higgs
Draft 2.0	4/04/11	Jane McIntosh	Nick Graham-Higgs	Nick Graham-Higgs
Final 1.0	15/08/11	Jane McIntosh		Nick Graham-Higgs

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1 INTRODUCTION

This Statement of Environmental Effects (SEE) has been prepared for Perisher Ski Resort to assess the environmental impacts of a proposal to upgrade the electrical infrastructure at the base of the Smiggin Holes ski area and to identify mitigation measures and environmental best practices to be implemented to reduce any potential adverse impacts.

The proposal primarily involves trenching works to install 415 volt power cables from the main Smiggin Holes switchboard, located in the Smiggin Holes mountain office, to Wattle Lodge, Kaaten Triple Chairlift and the Smiggin Holes lift maintenance workshop. In association with these works, Perisher Ski Resort would take the opportunity to install fibre optic cable as part of the ongoing upgrade of the resort's communications system. The location of the proposed works within Perisher Ski Resort is shown in Figure 1-1.

The proposed works would be undertaken using a two staged approach. Stage 1 includes the upgrade of power to Wattle Lodge and Kaaten Triple Chairlift and the associated electrical works inside the switch room. Stage 2 involves the upgrade to the Smiggin Holes lift maintenance workshop which also supplies power to Zoe's Carpet. All works are planned to take place during the 2011-2012 summer.

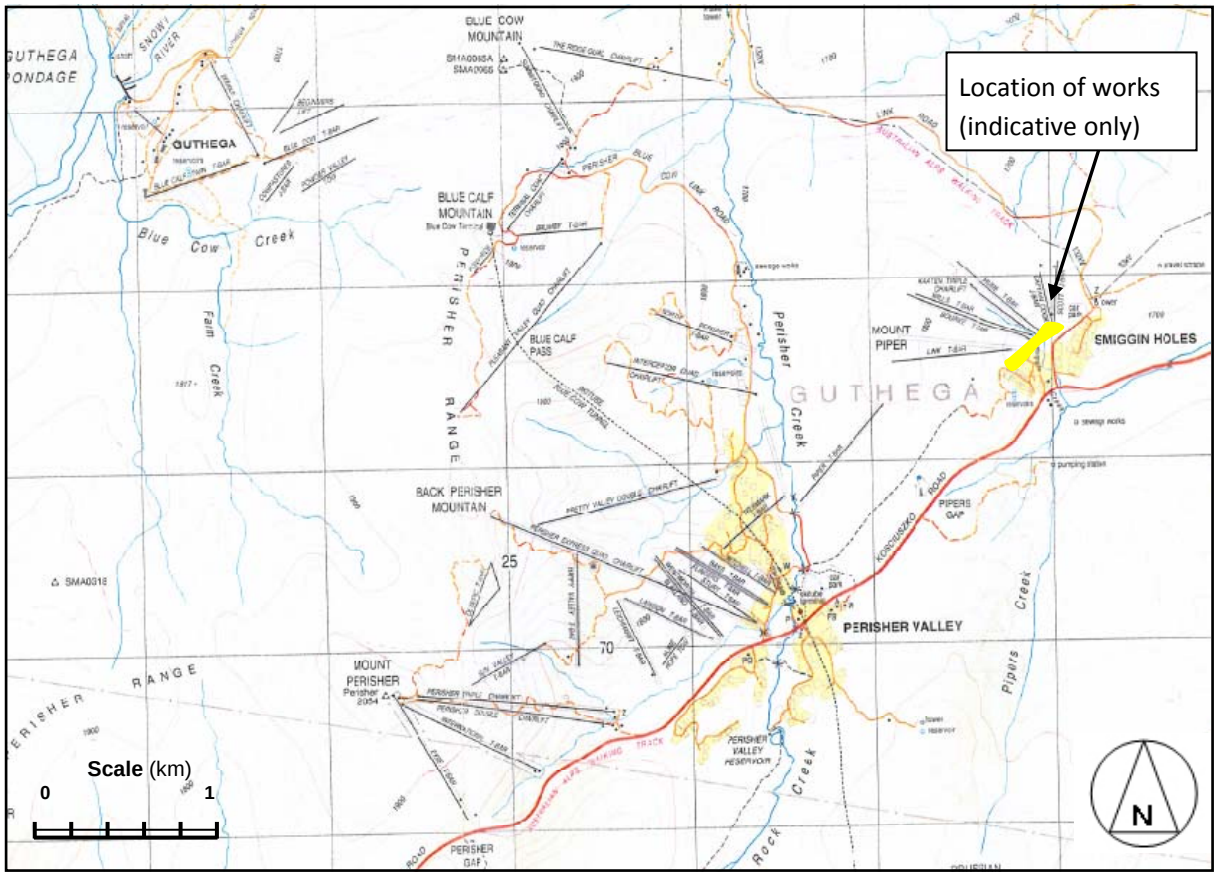

Figure 1-1 Location of proposed works within Perisher Ski Resort.

2 PLANNING REQUIREMENTS

2.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The *Environmental Planning and Assessment Act* (EP&A Act) provides the framework for environmental planning and development within New South Wales. This SEE has been prepared under Part 4 of the Act which relates to development requiring consent under a planning instrument. Section 79C of the Act lists the matters which must be taken into consideration by the consent authority when determining a development application. Table A-1 in Appendix A lists these matters and provides a summary assessment of each of these matters including, where appropriate, a cross reference to the relevant sections in this report.

2.2 ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION 2000

Schedule 1, Part 1 of the *Environmental Planning and Assessment Regulation 2000* states that all development applications must be accompanied by a Statement of Environmental Effects, except in the case of those that are classified as designated development. Clause 2 (4) states that a Statement of Environmental Effects must indicate the following matters:

(a) the environmental impacts of the development

(b) how the environmental impacts of the development have been identified

(c) the steps to be taken to protect the environment or to lessen the expected harm to the environment

(d) any matters required to be indicated by any guidelines issued by the Director-General for the purposes of this clause.

In preparing this SEE, a scoping assessment of all potential environmental impacts has been undertaken to ensure all relevant environmental matters are considered to an appropriate level of detail. A summary of this scoping assessment is provided in Chapter 4.

2.3 STATE ENVIRONMENTAL PLANNING POLICY (KOSCIUSZKO NATIONAL PARK – ALPINE RESORTS) 2007

State Environmental Planning Policy (Kosciusko National Park – Alpine Resorts) 2007 provides the framework for planning and development within the alpine resort areas in Kosciuszko National Park and is the relevant instrument of consent. This main aim of the SEPP is to protect the natural and cultural heritage of land within the alpine resorts and to encourage environmentally sustainable development. Key requirements of the policy include:

- to protect the unique alpine environment all development is to be subject to the assessment of environmental impacts
- geotechnical and land stability associated with construction in steep alpine environments are to be rigorously assessed
- all major development proposals are to be advertised
- development proposals are to be referred to the NSW Department of Environment and Climate Change (now known as NSW Department of Environment, Climate Change and

Water, DECCW) for comment and to be authorised under the *National Parks and Wildlife Act 1974.*

The upgrade of electrical infrastructure at the base of Smiggin Holes is consistent with the aims and objectives of the SEPP. Clauses 14 and 15 of the Policy list the factors which need to be considered by the consent authority when determining a development application. The factors that are listed in Clause 14 are included in Table A-2, Appendix A, together with a summary assessment of each of these factors. Clause 15 relates to the erection of a building and is therefore not included in this assessment.

2.4 OTHER RELEVANT LEGISLATION, PLANS AND POLICIES

2.4.1 Integrated development

Section 91 of the EP&A Act identifies integrated development as being development that requires development consent and one or more additional approvals or permits in order for it to be carried out. Part of the proposed works would involve crossing a piped tributary of Smiggins Creek and would be undertaken on land that is identified as being riparian corridor land in the map titled 'State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007 – Perisher Range Alpine Resort'. The proposed works would therefore require a controlled activity approval from the NSW Office of Water under Section 91 of the *Water Management Act 2000.*

2.4.2 Advertised development

Clause 27 of State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007 outlines the criteria for when a development becomes advertised development and must therefore be made available for inspection at the Department of Planning and Infrastructure's head office for at least 28 days.

Development is advertised if it involves any of the following:

- The erection of a building with a footprint of more than 1,000 square metres
- The erection of a new ski-lift line or the extension of an existing ski-lift line
- Damage to any plant that is part of:
  - (i) an endangered ecological community or a vulnerable ecological community, or
  - (ii) feldmark, short alpine herbfield or snowpatch on land identified as containing such a plant community in any Figure (other than Figures 1 and 11) in the Kosciuszko Resorts Vegetation Assessment.
- The disturbance of any wetland forming part of an endangered ecological community or a vulnerable ecological community

The proposed works would not involve any of the above matters and the development is therefore not considered to be advertised development.

2.4.3 National Parks and Wildlife Act 1974

This Act provides for the protection, regulation and management of native plants and wildlife (excluding fish) and for the legal protection and management of Aboriginal sites. Implementation is the responsibility of the National Parks and Wildlife Service. Impacts to native flora and fauna as a result of the proposed development have been assessed in Section 5.1 of this SEE.

Section 90 of the Act prohibits a person from knowingly destroying or damaging an Aboriginal place or relic. Archaeological heritage within Perisher Ski Resort has been the subject of detailed assessment and this information is available, on request, from the National Parks and Wildlife Service Jindabyne office. Based on this information (received 2 March 2011), an assessment of the potential impact of the proposed works on Aboriginal heritage has been undertaken and is included in Section 6.1.

2.4.4 Threatened Species Conservation Act 1995

The Threatened Species Conservation Act (TSC Act) is the key piece of legislation relating to the protection and management of biodiversity and threatened species. The purpose of the TSC Act is to:

- conserve biological diversity and promote ecologically sustainable development
- prevent the extinction and promote the recovery of threatened species, populations and ecological communities
- protect the critical habitat of those species, populations and ecological communities that are endangered
- eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities
- ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed, and
- encourage the conservation of threatened species, populations and ecological communities through co-operative management.

An assessment of the potential impact on threatened species, populations and endangered ecological communities as a result of the proposed works is included in Section 5.1 of this report and in Appendix D (flora) and Appendix E (fauna). Clause 14 of the State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007 requires the consent authority to take into account recovery plans and threat abatement plans under Sections 69 and 86 of this Act.

2.4.5 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's key piece of environmental legislation. The EPBC Act focuses on the protection of matters of national environmental significance. These include:

- World heritage properties
- National heritage places
- Wetlands of international importance
- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mines)

Any action that is likely to have a significant impact on a matter of national environmental significance requires approval from the Environment Minister. Perisher Ski Resort is located within the Australian Alps National Parks and Reserves which is listed on the National Heritage List for its outstanding natural and cultural heritage significance to the nation. An assessment of impact against the National Heritage

Criterion is included in Appendix G. A referral to the Environment Minister under the EPBC Act is not warranted for this proposal.

2.4.6 Kosciuszko National Park Plan of Management 2006

The Kosciuszko National Park Plan of Management 2006 (KPoM) has been prepared under the NSW *National Parks and Wildlife Act 1974* to provide a framework of objectives, principles and policies to guide the long-term management of the broad range of values contained in the park (DECCW 2006). The KPoM, in conjunction with the State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007, provides an integrated planning system for the alpine resorts based on a vision that seeks to:

- Develop viable, high quality resorts
- Provide opportunities and benefits for the regional community
- Ensure that all visitors have the opportunity to enjoy a range of recreational activities in the unique alpine environment, while acquiring a memorable experience and understanding the significance of the park.

The overarching principle emphasises the need for an environmentally sensitive and sustainable approach for the management of ski slopes and ongoing development. This works proposed in this SEE are in accordance with the KPoM.

2.4.7 Perisher Ski Resort Master Plan

The Perisher Ski Slope Master Plan (SSMP, Perisher Blue Pty Limited 2002) of the Perisher Range resorts outlines the intended future development within the Perisher Ski Resort. The development of the SSMP has been driven by the five main goals which reflect both operational goals and environmental considerations. One of these goals is 'modernisation' which relates to the replacement of outdated lifts and equipment and the upgrading of other facilities to meet current expectations of safety and convenience. The proposed upgrade of electrical infrastructure is therefore consistent with this goal.

In addition, the installation of an optic fibre cable into the trench is in accordance with the commitment to install all services to a particular part of the ski slopes in a single, integrated operation. This is advantageous to avoid repeated disturbance to the ground, facilitating effective rehabilitation and reducing the risk of damage to existing services through subsequent excavation.

As part of the village development, it is proposed to upgrade the Wattle Lodge building and, amongst other things, to relocate the Smiggin Holes Ski School operations into this building. The proposed works would complete the first stages of this upgrade through the installation of suitable power and communications infrastructure.

2.4.8 Principles of Ecologically Sustainable Development

One of the overarching objectives of the KPoM, the Perisher Ski Slope Master Plan and the State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007 is that all development is completed in a manner that is ecologically sustainable. The principles of ecologically sustainable development include:

(a) The precautionary principle. In regard to threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

(b) Intergenerational equity. The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations

(c) Conservation of biological diversity and ecological integrity. The conservation of biological diversity and ecological integrity should be a fundamental consideration

(d) Environmental factors should be included in the valuation of assets and services.

This SEE has been guided by the principles of ecologically sustainable development.

3 THE PROPOSAL

3.1 BACKGROUND AND REASONS FOR THE PROPOSAL

The operation of the Smiggin Holes ski area during the winter ski season depends on a reliable electricity supply to power nine ski lifts and three main buildings that house facilities which include the lift maintenance workshop, the Smiggins ski patrol base, staff offices and the generator room. Power is supplied to the resort through a ring main that is fed from either the substation above the Smiggins Hotel or the substation adjacent to Snowy Gums Lodge which is located on the eastern side of Smiggins car park. The existing network for electricity supply to ski resort infrastructure is summarised as follows:

- The primary source of power for all lifting infrastructure at Smiggin Holes is electricity with no remaining diesel powered lifts. Burke and Wills T-Bars, Link T-bar and Harry and Hermans Rope Tow are supplied power from the main Smiggin Holes switchboard which is centrally located in the switch room within the mountain office building.
- Hume T-bar, Scott J-bar and Captain Cook J-bar are powered from the Essential Energy pillar box located adjacent to the Hume T-Bar lift hut.
- The power source to the Kaaten Triple Chairlift is via an Essential Energy cable that connects to the chairlift from a pillar box located adjacent to the north-east corner of the Smiggins Hotel. The cable is buried and crosses underneath the ski school meeting area and the Harry and Hermans Rope Tow.
- The Smiggin Holes lift maintenance workshop is supplied power from an Essential Energy cable that connects to a pillar box on the north-west corner of the Smiggins Hotel building. The lift maintenance workshop then supplies power to Zoe's Carpet.
- Wattle Lodge, which houses a ticket office, the ski patrol base station, a kiosk and staff accommodation, is connected directly to the main Smiggin Holes ring main.

Perisher Ski Resort propose to upgrade and simplify the existing electricity network by consolidating the supply of power to all resort owned infrastructure at the base of Smiggin Holes from a central source. The primary driver for the upgrade is the age of the existing infrastructure and the potential problems that may result from the ongoing deterioration of the cables in the future. Replacement of this infrastructure will be required at some point in time and Perisher Ski Resort wish to avoid any risk of emergency works having to be undertaken during the winter season.

During the replacement program, Perisher Ski Resort would take the opportunity to simplify the existing network so that all lifts and buildings are connected to the main Smiggin Holes switchboard. This would allow the switch to backup supply, in the case of a power failure, to occur in one coordinated action. This is in contrast to the present situation where the generator can supply power to only those lifts that operate from the main Smiggin Hole's switchboard plus Hume T-Bar, Scott J-bar and Captain Cook J-bar. The operation of Kaaten Triple Chairlift relies on a diesel powered auxillary motor and the switch to the backup system must be carried out independently of all other lifts. Wattle Lodge, the lift maintenance workshop and therefore Zoe's Carpet, must also be switched to backup supply independently. Connection of these lifts and buildings to the main Smiggin Holes switchboard would improve operational efficiency and minimise any disruption to Perisher Ski Resort guests that may occur as a result of power interruptions.

In addition to these operational benefits, the proposed upgrade of the energy network system would consolidate the supply of energy to the Smiggin Holes ski area simplifying issues relating to energy

management. The works would also allow for the removal of the meter box that is attached to the back of the Kaaten Triple Chairlift hut which can hinder snow grooming operations and also become a hazard, particularly in snowy weather conditions.

While undertaking these works, Perisher Ski Resort would take the opportunity to install fibre optic cable into each trench as part of the resorts ongoing upgrade of the communications system.

3.2 OBJECTIVES

The objective of the proposed works is to simplify and update the existing electricity network at the base of Smiggin Holes so that all Perisher Ski Resort owned infrastructure can be operated from a single electricity supply. This would reduce operational issues that arise when the power supply to the resort is interrupted, remove potential hazards for snowgrooming operations and would also improve energy management within the Smiggin Holes ski area.

3.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The installation of electrical infrastructure would primarily involve trenching works and would be undertaken in two stages. Each stage is described below and is shown in Figure 3-1.

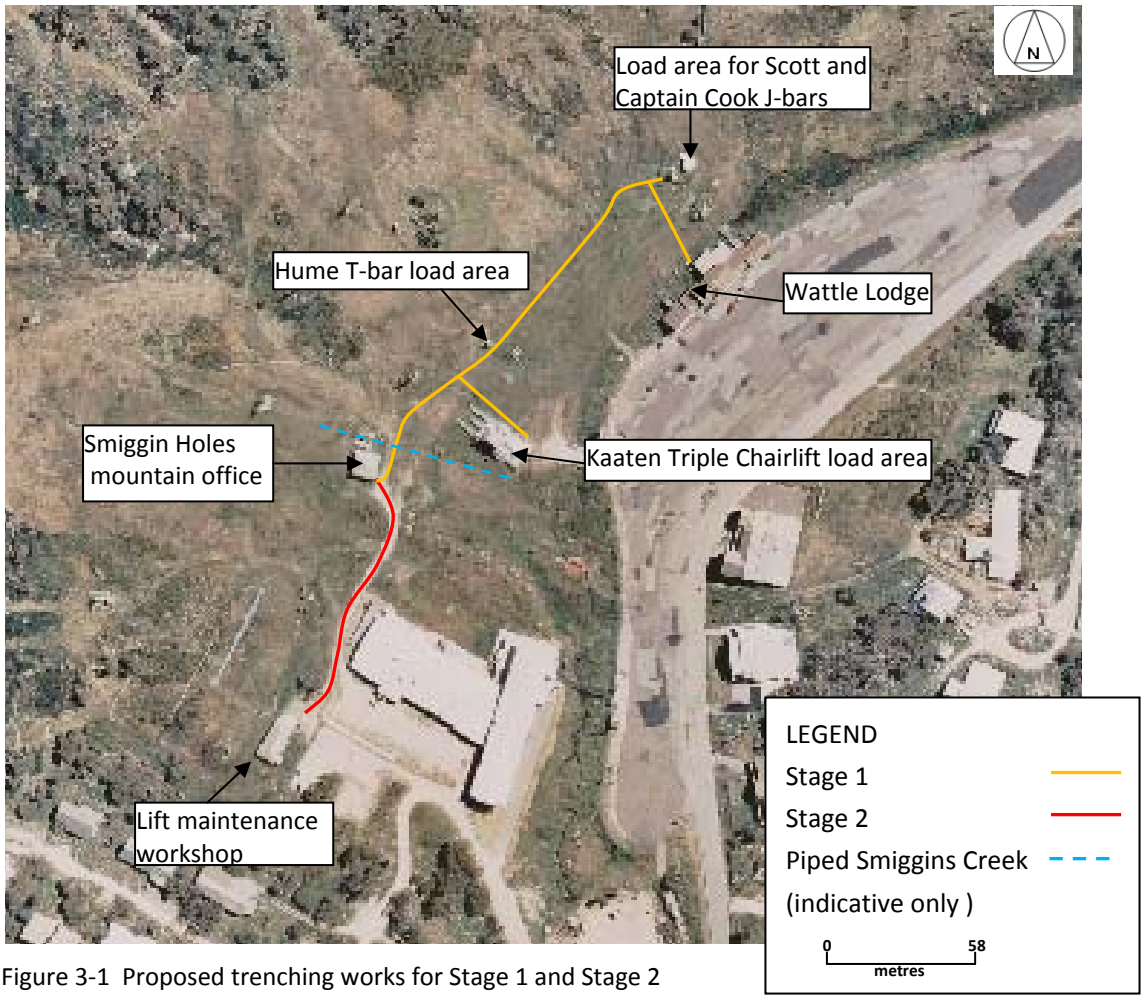

Figure 3-1 Proposed trenching works for Stage 1 and Stage 2

3.3.1 Stage One

Stage 1 includes the upgrade of the power supply to Wattle Lodge and Kaaten Triple Chairlift. The works would involve the excavation of a trench, approximately 160 metres in length, between the Smiggin Holes mountain office and the base of Scott and Captain Cook J-bars plus two 35 metre spur lines from this trench to Wattle Lodge and Kaaten Triple Chairlift (see Figures 3-2 to 3-4, indicative only).

Figure 3-2 Location of trench between mountain office and the J-Bars

Figure 3-3 Spur line to Kaaten Triple Chairlift

Figure 3-4 Spur line to Wattle Lodge

The trenching would take place within an area that is highly modified and is dominated by exotic grasses that are generally representative of the 'alpine mix' that was once used for revegetation projects throughout the resort. The first fifteen metres of the trench (beginning at the mountain office) would be excavated in an existing access track that has a combined gravel and grassy surface. Towards the J-bars, the trench would pass through a seepage area that contains a mixture of exotic grasses and native rushes and sedges that have recolonised the site post disturbance.

Each trench would be 300 mm wide and 600 mm deep and would result in a disturbance corridor of approximately three metres, just greater than the width of the seven tonne excavator that would be undertaking the works. During the excavation works, the topsoil and sods would be separated from the remainder of the spoil and, where the trench traverses across the slope, would be placed on the downhill side of the trench. The remainder of the spoil would be stockpiled along the length of the trench on the uphill side, where appropriate. Two 125 mm conduits, one to house the new power cable and the second to provide a spare for future use, would be placed at the base of the trench and would be covered with at least 100 mm of fine material sourced from the excavated spoil. Three 50 mm conduits (one for fibre optic and two spares) would then be placed in the trench which would be backfilled by the remaining spoil ensuring danger tape is installed at least 300 mm below the surface. The works would be completed in sections to minimise the time that the trench remains open. Where practicable, each section would be opened and closed within a day and revegetated if possible. If excess spoil is generated as a result of the works, it would be loaded into the back of a HD carrier and taken to the nearby Smiggin Holes stockpile site.

Groundwater seepage into the trench may occur in the north-eastern part of the site between Hume T-bar and Scott and Captain Cook J-bars. If necessary, this water would be pumped from the trench to the downhill side using a portable water pump and hose. Any rock encountered in the trench would be removed by blasting if unable to be avoided. Rocks would be drilled by an airdriven rock drill mounted to a tracked vehicle or by hand rock drills powered by a compressor that is positioned in the back of a HD carrier. Blasting mats would be placed over the rocks prior to blasting to contain any flyrock that may be generated by the blast. On completion of the blast, the excavator would load the resultant rock fragments into the back of a HD carrier which would transport them to the Smiggin Holes stockpile site.

Between the Smiggin Holes mountain office and the Kaaten Triple Chairlift, the trenching works would be undertaken in an area which is identified as a riparian land corridor in the State Environmental

Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007. The trench must cross a tributary of Smiggins Creek which is confined to a concrete pipe culvert that is buried approximately one metre underground. The trenching is not expected to expose this culvert and would therefore not have any impact on the creek or its water flow. Excavation in this area would, however, be undertaken in a careful manner and if the culvert is found to be located closer to the surface, the trench would be excavated by hand and the conduits installed below the culvert.

On completion of the works, any disturbed ground would be stabilised with a mix of native *Poa* seed and Chewings fescue. The corridor would be mulched with hay that is sourced from an approved NPWS supplier, and then sprayed with an anionic bitumen emulsion which speeds the rate of growth and provides protection to the hay in times of high winds.

The remaining Stage 1 works require connecting the new power cables to the electrical switchboards in the Kaaten Triple Chairlift, Wattle Lodge and the Smiggin Holes mountain office. For Kaaten Triple Chairlift this would involve the installation of a pillar box at the end of the spur line. From this box the power cable would pass through the floor of the lift hut and into the electrical switchboard.

At the Smiggin Holes mountain office, the works would mostly be internal and would involve removal of a small part of the rock wall to gain building access into the electrical room and the cutting of a channel, approximately 100mm deep, in the concrete slab inside the building to house the cables from this entry point to the switchboard. A jackhammer and concrete cutter would be required for these works.

At Wattle Lodge, a small part of a rock wall on the northern side of the building would be removed to allow the power cable to be attached to a concrete beam that spans the width of a drainage line which passes underneath the lodge (see Figures 3-5 to 3-6).

Figure 3-5 Area that rock wall would be removed from Wattle Lodge

Figure 3-6 Power (indicated by red line) would be attached to concrete beam above drainage line

This would avoid the need for any works to take place within this drainage line and would provide the most direct route to the switchboard inside Wattle Lodge. A jackhammer and general work tools would be required for these works.

This stage of the works is expected to take five days and is planned to be undertaken during the 2011 – 2012 summer. Construction hours would be Monday to Friday 7:30am to 5:30pm with the potential for work on Saturday if required.

3.3.2 Stage Two

The second stage of the works would connect the Smiggin Holes lift maintenance workshop to the main Smiggin Holes switchboard and would require excavation of a trench with the same dimensions and components that are required for Stage 1. The trench would be approximately 100 metres in length and would be confined to the existing gravel road (Figure 3-7).

The proposed works would not require disturbance to any vegetation and there would likely be no requirement for blasting works. The existing road surface would be excavated first and placed on the downhill side of the trench. The remaining subsoil would then be placed on the uphill side of the trench and would be immediately backfilled after the conduits have been installed. On completion of the works, the road surface would be reinstated, with additional gravel brought to the site by truck if necessary.

The works are expected to take three days and are proposed to take place during summer 2011 – 2012.

Figure 3-7 Route of proposed trenching for Stage 2

4 SCOPING ASSESSMENT

The following scoping assessment has been undertaken to ensure all environmental issues are considered in relation to the proposal. The purpose is to identify those environmental issues that will be impacted as a result of the proposed works and to determine their relative importance. Those issues with the highest level of risk are considered key environmental issues and are analysed in further detail in Chapter 5. Those environmental issues with a lower level of risk are addressed in Chapter 6. Some environmental issues would not be impacted by the proposed works and are considered irrelevant to this proposed development. These are issues of Negligible Environmental Risks, and are indicated by a dash ('-') and are not considered further in this SEE.

Table 4-1 Summary of scoping assessment

ENVIRONMENTAL ISSUE	COMMENTS	RELEVANT CHAPTER, SECTION
Key Environmental Issues		
Biodiversity	The online Commonwealth Matters of National Environmental Significance and the NSW threatened species search tools identified threatened species and ecological communities that have the potential to be present at the subject site. The potential for the proposed works to impact on these threatened entities is assessed in this SEE.	5.1
Impacts on any water body, watercourse, wetland or natural drainage system	One creek and one drainage line is located within the vicinity of the subject site and part of the proposed works would take place on land that is within the riparian land corridor identified in the map titled 'State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007 – Perisher Range Alpine Resort.	5.2
Soil	The proposed works would result in disturbance to soils at the subject site to a depth of 600mm through excavation and backfilling. Ongoing erosion and sedimentation may result if environmental safeguards and mitigation measures are not implemented.	5.3
Construction Impacts	<u>Noise and vibration</u> The works would require the use of machinery that generate noise. Minimal blasting works may also be required. <u>Air quality</u> Atmospheric pollutants such as emissions generated from the construction machinery would occur throughout the course of construction. <u>Soil erosion</u> Excavated spoil would be stockpiled adjacent to the trench and is vulnerable to erosion until reinstated into the trench. <u>Hydrology</u> The lower slopes of the Smiggin Holes ski area holds groundwater and can remain relatively wet regardless	5.4

ENVIRONMENTAL ISSUE	COMMENT	RELEVANT CHAPTER, SECTION
	of seasonal conditions. In the north-eastern part of the subject site, groundwater seepage into the trench is likely and would need to be managed. <u>General physical disturbance</u> The works would require rehabilitation after completion. <u>Traffic access</u> During construction of Stage 2, there would be no vehicle access into the base of the ski area while the access road is being excavated.	
Effects on ski resort operation e.g health and safety	Upgrading the electrical infrastructure would improve operational efficiency, particularly in terms of restarting lifts when interruptions to the power supply are experienced.	5.5
Low Level Environmental Risk		
Aboriginal Cultural heritage	The site is not located in an area that has been assessed as having archaeological sensitivity for Aboriginal artefacts.	6.1
Natural and European Cultural heritage	The Australian Alps National Parks is listed on the National Heritage List which is protected by the EPBC Act. There are no areas of European cultural heritage significance that would be affected by the proposal.	6.2
Energy use and energy conservation	The proposed works would improve energy management within the Smiggin Holes ski area through the installation of a consolidated network.	6.3
Negligible Environmental Risk		
Social and economic impact	No social impacts, other than those associated with ski resort operation (see section 5.5) would occur as a result of the upgrade works. Better management of energy within the area could translate into financial savings for Perisher Ski Resort.	-
Hydrology impacts – ongoing	The proposed works do not involve drainage works or any activities that would impact on the hydrology of the site in the long term.	-
Topography	The subject site is located in the base of the Smiggin Holes ski area on flat ground. The topography will remain unaffected by the proposal.	-
Impacts on water quality – ongoing	The proposed works is not expected to alter the volume and pattern of stormwater runoff that enters water bodies downstream and once stabilised is not likely to be an ongoing soil erosion risk that could result in sedimentation issues.	-
Microclimate and snow behaviour effects	The proposed works would not result in the installation of structures or buildings that could modify wind strengths, alter shading or effect snow deposition or snow melt.	-

ENVIRONMENTAL ISSUE	COMMENT	RELEVANT CHAPTER, SECTION
Fire and bushfire issues	There would be no additional risk of fire or bushfire from the proposed works as the area would be rehabilitated to a condition that is similar to the existing environment at completion of the works. During construction, there would be no need for hot works to occur.	-
Ongoing visual amenity	The proposed works would result in the installation of infrastructure underground. There would be no ongoing visual impacts as a result of this proposal.	-
Ongoing noise and vibration	There would be no ongoing noise or vibration impacts resulting from the proposed works.	-
Natural resources impacts	Diesel to operate the excavator (and any other vehicles) would be consumed during the construction phase of the project. In the long term, the proposal would not require any additional input of resources above the current electricity requirement.	-
Traffic and access	Vehicle access within the subject site is restricted to the access track that runs between the lift maintenance work shop and the mountain office and is not accessible to vehicles other than those belonging to Perisher Ski Resort. The remainder of the subject site is accessible on foot or by 4WD quad bike and access would not be affected by the proposal. Access to the Kaaten Triple Chairlift and Wattle Lodge is via the Smiggin Holes car park.	-
Air quality and climate - ongoing	The proposed works would not result in the ongoing generation of airborne emissions or odours that may adversely influence local air quality or climate and hence the amenity of the area and the health of people, wildlife and vegetation.	-
Geotechnical considerations	The proposed works are located outside the area mapped as 'G' on the Smiggin Holes Geotechnical Policy map and would not require excavation to a depth of one metre of more. No geotechnical investigation is required as part of these works.	-
Geological heritage	The upper east facing slopes of the Smiggin Holes ski area have been identified as an area that resembles a glacial cirque and is mapped as a feature of geological and geomorphological significance within the Perisher Ski Resort. (Figure 10.3, Perisher Blue Pty Limited 2002). This area is remote from the subject site and would not be impacted by the proposed development. The proposed works would not result in the removal of any boulders and would not alter the landscape value of the area.	-
Waste management	The proposal would not generate any domestic, commercial or hazardous waste in the short or long term.	-

ENVIRONMENTAL ISSUE	COMMENTS	RELEVANT CHAPTER, SECTION
Water use and wastewater management	The proposal would not require an ongoing supply of water and no wastewater would be generated as a result of the proposal.	-
Land use impacts	The proposal would not change the current land use of the subject site.	-
Legal and administrative matters	The proposal is consistent with all relevant legislation and planning instruments and does not require the issue of a new lease or licence.	-
Cumulative impacts	The proposed works are to be undertaken in an area that is heavily modified by ski resort development. The upgrade of the electrical infrastructure at the base of Smiggin Holes would not add to the physical, ecological and visual impacts that already exist.	-

5 ENVIRONMENTAL ASSESSMENT – KEY ISSUES

The scoping assessment identified the following key issues that warrant further investigation in this SEE. These include:

- Biodiversity impacts
- Impacts on any water body or watercourse
- Impacts to soils
- Construction impacts
- Impacts on ski resort operation

5.1 BIODIVERSITY

5.1.1 Flora and ecological communities

Regional context

The Kosciuszko subalpine zone supports bog complex and sod tussock grassland in drainage lines and poorly drained areas, tall alpine herbfield on well drained flats, tall heath on slopes and ridgetops and snow gum woodland with dry heath and grassy understorey on ridges and upper slopes. The position of each vegetation type is governed by the distribution of snow and groundwater, which are determined by physiography (ISC 2002).

Alpine and high subalpine communities are rare and restricted on a state and national level. Eleven plant species and one vegetation community (bog complex) occurring in alpine/subalpine areas in Kosciuszko National Park have been listed as threatened under NSW and/or Commonwealth legislation. The park also supports a range of ROTAP and endemic species (including 21 alpine endemics). Approximately 20 significant plant species have been recorded in the Perisher Range resorts area. The park has been recognised by the International Union for Conservation of Nature (IUCN) as one of six Australian sites of outstanding plant diversity (Good 1992).

Methods

DESKTOP ASSESSMENT

Information was compiled on threatened species, populations, and communities having potential to be present at the subject site and in the wider study area. Current reference books, research papers, planning reports, environmental surveys and assessments, online search tools, databases and publications were sourced. The online Commonwealth Matters of National Environmental Significance and NSW threatened species search tools were used to assess the potential presence of threatened species and communities at the subject site.

FIELD SURVEY

A flora survey was undertaken at the subject site on 12 February 2011, using an adaptation of the 'random meander' method documented by Cropper (1993). 0.5 person hours was spent on the flora component of the field survey. Species occurrences were recorded progressively and cover/abundances were then generalised over the extent of each vegetation type. The location of any species and communities of conservation significance, and noxious or invasive weeds present at the site were recorded using a 12 channel hand-held GPS unit. Map references are given in GDA datum. The relative

cover/abundance of species is based on visual estimates of foliage cover (after Carnahan 1997), and is scored using a six level Braun-Blanquet scale.

The survey area incorporated the proposed works site (refer Figure 3-1) with a 2 metre buffer to account for potential indirect and peripheral impacts. A species list compiled for the survey area, with cover/abundance values is included as Appendix B.

LIMITATIONS

The survey timing was good for the identification of most species. Some geophytic species or spring flowering annuals may not have been recorded. Survey conditions were adequate to enable the identification of vegetation type and condition, and the likelihood of significant species and communities being present. On this basis, it is considered unlikely that any significant flora species will have been overlooked due to seasonal factors.

The site had been recently slashed, which made it difficult to determine the relative abundances of dominant grasses. However, the site is dominated by exotic grasses and this limitation is not a significant impediment to the assessment of impacts.

Vegetation communities at the site

The subject site is located at the edge of a subalpine frost hollow valley. Natural vegetation communities have been replaced by exotic species ('alpine mix') sown during the development of the ski resort. The dominant species include Red/Chewings Fescue, Brown-top Bent, Timothy grass, Cocksfoot and White Clover. Wet areas beside the Kaaten Triple Chairlift and at the north-eastern end of the site have been recolonised by native sedges and rushes, particularly *Carex gaudichaudiana, Carex echinata* and *Juncus falcatus*. *Sphagnum* moss patches have also developed in seepage areas at the north-eastern end of the site.

Plant species of conservation significance

No species listed under the TSC Act, the Commonwealth EPBC Act or in the Plan of Management Schedule 1 Significant Natural and Cultural Features were recorded at the subject site. The potential for threatened and otherwise significant species to occur at the site, and the potential for impact by the proposed works are evaluated in Appendix D. In view of the level of disturbance and the dominance of exotics, no threatened species would be expected to occur at the site.

The EPBC Act Protected Matters Search Report identified four threatened plant species within the 10 kilometre radius search area; *Argyrotegium nitidulum, Calotis glandulosa, Ranunculus anemoneus* and *Thesium austral* (refer Appendix C). *Calotis glandulosa* and *Thesium australe* occur in woodland and grassland at elevations lower than the study area. On the basis of available habitat and known distribution, these species are considered highly unlikely to be present (refer Appendix D).

Weeds

There are 330 weed species recorded in the park, and two-thirds of these occur in the alpine and subalpine areas (DEC 2006). More than half of the high elevation weeds occur in the resorts (DEC 2006).

Disturbed sites have been sown with a range of pasture and soil conservation species including grasses and legumes. Opportunistic weeds have also colonised disturbed areas in the subalpine zone. Critical priority weeds identified in the Perisher Range Environmental Management System include Brown-top Bent (**Agrostis capillaris*), Yorkshire Fog (**Holcus lanatus*), Soft Rush (**Juncus effusus*), St John's Wort

(**Hypericum perforatum*), Sweet Vernal Grass (**Anthoxanthum odoratum*), Wintercress (**Barbarea verna*) and Yarrow (**Achillea millefolium*) (DECC 2008).

Yarrow, Brown-top Bent, Sweet Vernal Grass, Soft Rush and St John's Wort, together with Willows (**Salix* spp), Vipers Bugloss (**Echium vulgare*), Lupins (**Lupinus* spp), Broom (**Cytisus scoparius*), Orange Hawkweed (**Hieracium aurantiacum*) have been identified as the ten worst weeds in the resorts (NPWS 2006). Wetland sites are also vulnerable to invasion by Jointed Rush (**Juncus articulatus*), Musk Monkey-flower (**Mimulus moschatus*), Trefoil (**Lotus* spp) and Glandular Willow-herb (**Epilobium ciliatum*).

Brown-top Bent is a prominent component of the exotic grass sward on the proposed cable trench routes. Soft Rush is scattered in wet areas in the north-east of the site. No declared noxious weeds or Weeds of National Significance were recorded at the subject site.

Impact assessment

POTENTIAL IMPACTS

The proposed works would require the clearing and excavation of approximately 69m^2 of a heavily disturbed area dominated by exotic grasses (Stage 1) and 30m^2 of the gravel road (Stage 2). During Stage 1, a further 591m^2 would be subject to peripheral disturbance over a 3 metre wide corridor due to vehicle and machinery access, spoil deposition and retrieval and materials stockpiling. In Stage 2, these works would be confined to the existing gravel road.

No threatened flora species or species listed as significant in the Plan of Management were recorded in the proposed works area, and none would be expected to occur there.

However, the site is located in a sensitive lower slope position, upstream of significant wet heath and bog vegetation. There is potential for the works to affect this vegetation indirectly through sedimentation, pollution and the spread of weeds such as Soft Rush. The deposition of sediment can fill fen pools and allow dryland species and weeds to colonise. Specific mitigation measures have been identified to manage these risks and avoid significant impacts to vegetation located downstream of the site.

IMPACT SIGNIFICANCE

Subject to the implementation of these measures, the works would not significantly affect flora values and ecological communities at the site.

IMPACT MITIGATION

- Sedimentation and erosion controls would be implemented as outlined in the Construction Environment Management Plan (CEMP, Appendix F) to manage soil erosion and sedimentation at the site.
- The area of regenerating *Sphagnum* moss in the north-east of the site should be avoided during the works if possible. The total area of vegetation disturbance should be minimised.
- The works should apply a high level of weed hygiene to prevent the introduction and spread of environmental weeds at the site. If possible, haybales and imported fill or gravel should come from certified weed-free sources.
- Where possible, works would be avoided during, and immediately following heavy rainfall events to protect soils and vegetation at the site.

- The rehabilitation guidelines for the KNP resort areas (NPWS 2006) would be applied as appropriate, particularly in relation to weed control, rehabilitation and revegetation.

5.1.2 Fauna

Regional context

A diversity of fauna utilise habitats within the Perisher Range area which ranges from snow gum woodland communities, open grassland, dense diverse heath, bog areas and watercourses. Mammals, birds, reptiles, amphibians and invertebrates have all been recorded throughout the area, and some are endemic to the subalpine and alpine areas.

The most common mammals that occur within the resort area are the bush rat, dusky antechinus and the broad-toothed rat which is listed as vulnerable under the NSW TSC Act. The bird species of the area are mostly seasonal or transient visitors. Reptiles include various species of skinks and snakes and 12 frog species have been recorded throughout the area (Good 1992). Invertebrates play an important role in the alpine ecosystem and include grasshoppers, spiders and the migratory bogong moth that is an important food source for the mountain pygmy possum, a species that is listed as endangered under the Commonwealth threatened species legislation.

Methods

DESKTOP ASSESSMENT

Information was compiled on threatened species and populations having potential to be present at the subject site and in the wider study area. Current reference books, environmental surveys and assessments, online search tools and databases were sourced. The online Commonwealth Matters of National Environmental Significance and NSW threatened species search tools were used to assess the potential presence of threatened species at the subject site.

FIELD SURVEY

The habitat value of the site was assessed on 10 February 2011 to determine the potential presence of any fauna species. Notable habitat features or faunal signs were recorded. Due to the lack of heath vegetation or other habitat refuge (this site is subject to intensive slashing regime), no scat surveys were undertaken. No fauna species, including pest species, were recorded during the inspection.

Habitat characteristics

Habitat at the base of the Smiggin Holes ski area is restricted to exotic grassland that has very limited value for supporting animal species in terms of providing shelter, breeding habitat or food. Clearing has removed all trees and heath species within the vicinity of the proposed works and ecological connectivity has been fragmented by past ski slope development. Wildlife corridors exist on the upper and lower slopes of the ski area where stands of snow gums and heath vegetation remain, but the base area is heavily modified and is lacking any features of habitat significance.

A drainage line that passes beneath Wattle Lodge is ephemeral and highly disturbed. It may provide habitat to reptile and amphibian species and may also provide a water source for any birds.

Threatened species of conservation significance

The broad-toothed rat, listed as vulnerable under the TSC Act, occurs throughout most of the resort in areas of dense diverse heath and wet heath along watercourses. The species is known to be present

within the Smiggin Holes ski area where suitable habitat exists on the mid to upper slopes. The potential for threatened species listed under the TSC Act, the Commonwealth EPBC Act or in the Plan of Management Schedule 1 Significant Natural and Cultural Features is evaluated in Appendix E. Six species (including the broad-toothed rat) have been recorded within the Perisher Range Resorts area. Additional species include the alpine tree frog, spotted tailed quoll, eastern false pipistrelle, gang gang cockatoo and the olive whistler. In view of the level of disturbance and the lack of suitable habitat within the subject site, these species are not expected to occur in this area.

Impact assessment

POTENTIAL IMPACTS

The proposed works are to take place in an area that is heavily disturbed and contains exotic grasses or totally modified surfaces such as existing gravel access roads. There are very few habitat features within the subject site that would support any fauna species, particularly those that are threatened. It is possible that the broad-toothed rat may move within the subject site on an occasional basis when foraging for food, but the area is not considered suitable habitat for the species due to the lack of heath cover. The proposed works would not impact this species in the short or long term.

IMPACT SIGNIFICANCE

There would be no impact on fauna species or significant habitat as a result of the proposed works.

IMPACT MITIGATION

While there are no areas of sufficient habitat value within the subject site that warrant protection through the implementation of mitigation measures, there is a low risk of the trench creating a temporary movement barrier and entrapment hazard for ground fauna such as frogs, reptiles and small mammals. In the unlikely case that sections of the trench would be left open overnight, inclined timbers would be placed in the trench to allow animals to escape if required, and the trench would be inspected each morning for trapped fauna. If animals are found they would be removed from the trench and released into suitable habitat.

5.2 IMPACT ON ANY WATER BODY OR WATERCOURSE

5.2.1 Existing environment

One creek and one drainage line is located within the vicinity of the proposed works. Smiggins Creek runs in a south-easterly direction from the mid slopes of Smiggin Holes, through the base of the ski area and then into Pipers Creek with the confluence being just south of the Kosciuszko Road. The catchment encompasses the upper slopes of the ski area, particularly those in the vicinity of Hume T-bar, Kaaten Triple Chairlift and Wills T-bars. The creek, which was once free flowing, was diverted into an underground concrete piped culvert in the early stage of the Smiggin Holes ski slope development to improve drainage of the lower slopes and hence the capacity for these slopes to hold snow. The watercourse, and the land 40 metres to the east and west, is mapped as a riparian land corridor in the SEPP (Kosciuszko National Park – Alpine Resorts) 2007.

Wattle Lodge is built over a drainage line which feeds into Smiggins Creek approximately 100 metres downstream. At the time of the site inspection, water was present and flowing slowly. This drainage line

is not identified in the State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

5.2.2 Impact assessment

The proposed trenching works would not result in any disturbance to Smiggins Creek or the drainage line. The culvert, in which the creek is confined, is known to pass through the base of the ski area between the mountain office building and the Kaaten Triple Chairlift and is expected to be buried at a depth of at least one metre. It is unlikely that the proposed works would expose the culvert during construction. Regardless, a precautionary approach would be undertaken while excavating the trench in this area. If the culvert is uncovered, excavation would continue by hand. The conduits would be installed below the culvert and the trench would be reinstated without any disturbance to the creek or its flow. The impact on Smiggins Creek as a result of these works would be negligible.

To avoid excavation or any disturbance to the unidentified drainage line under Wattle Lodge, the conduits would be attached to a concrete beam that spans the width of the drainage line. Undertaking these works may require personnel to enter the creek on foot, but would not require any machinery to access the creek or the creek banks. The greatest potential risk of the proposed works to this drainage line relates to sedimentation issues that may occur as a result of stockpiling spoil adjacent to the trench in the vicinity of the drainage line. The low grade of the slope, however, makes the potential for any soil movement in this area unlikely. If stockpiles were to remain overnight, a sedimentation barrier would be installed below the stockpile to minimise risk. With these mitigation measures in place, the proposed works would not impact on this drainage line.

5.2.3 Impact mitigation

- If the Smiggins Creek culvert is uncovered, excavation of the trench would continue by hand to minimise the risk of disturbance.
- Conduits and cables would be attached to a concrete beam to avoid any disturbance to the drainage line beneath Wattle Lodge.
- Sedimentation and erosion controls would be implemented as outlined in the CEMP (Appendix F) to manage soil erosion and sedimentation at the site.

5.3 SOILS

5.3.1 Existing environment

Soils in the Kosciuszko alpine and subalpine region are mostly alpine humus soils that comprise a 10-20cm rich surface organic horizon that typically covers a poorly weathered mineral horizon (Cousins, Johnston and Field n.d) The soils are derived from granite and are generally course textured soils with a high susceptibility to erosion by water or wind once exposed.

An ongoing risk to soils within Perisher Ski Resort is the removal of groundcover vegetation and disturbance to natural soil profiles as a result of ski slope development projects. Much of the topsoil within the subject site has been previously disturbed, and there is potential for this disturbance to extend deeper into the subsoil. The soils at the site are stable, however, with a complete cover of vegetation, albeit introduced, protecting the soils from any erosion.

5.3.2 Impact Assessment

The proposed works would involve the excavation, stockpiling and reinstatement of the soil, and the subsequent rehabilitation of disturbed areas using a mixture of introduced and native grasses. The primary impact is the potential for soil to be stripped from the stockpiles through the process of erosion while the works are being undertaken. The potential for wind erosion to result in any significant impacts is unlikely due to the short construction period, the sheltered location of the site and the moisture content of the soils in parts of the site which reduces the risk of soil particles being picked up and carried away by wind. The risk of erosion would also be minimised by opening the trench in sections thereby reducing the time the spoil is stockpiled.

Erosion by heavy rain is unlikely as the works would be undertaken in dry conditions only and each section of trench would be closed each day if practicable. If an unexpected rain event did occur, however, the movement of soil any distance from the trench would be limited by the flat nature of the site, the presence of earth berms to provide a barrier to runoff and the presence of a good cover of vegetation to filter the sediment and slow the rate of runoff. The stockpiling of most of the spoil on the uphill side of the trench is a best practice technique that is more relevant to areas of moderate to steep slopes but would provide a further mechanism for preventing soil loss if required.

Another potential impact, the ongoing loss of soil post disturbance, would be reduced through the immediate revegetation of the site on completion of the works. The reinstatement of topsoil and sods on the surface of the trench would assist the immediate stabilisation of the site and would be beneficial to the rehabilitation process even though the seed bank would be dominated by introduced species. A mixture of Chewings fescue and native *Poa* seed would then be hand sown across the disturbed areas and covered with a layer of straw that is anchored by a light spray of bitumen emulsion. If *Poa costiniana* seed is on hand, it would be suitable to include this species in the wetter areas in the north-eastern part of the site. If suitable weather conditions prevail, the Chewings fescue would germinate and begin to sprout within a period of two weeks providing a reasonable cover of vegetation quite rapidly. The potential for ongoing soil loss as a result of the works is not considered to be significant.

5.3.3 Mitigation measures

The following mitigation measures would reduce the impact of the proposed development on soils.

- Works would not be undertaken in times of heavy rain or forecasted rain events
- Works would be undertaken in sections to minimise the length of time that the trench remains open and hence the time the spoil must be stockpiled
- Topsoil and sods would be separated from the remaining spoil during excavation
- Revegetation works would take place immediately following completion of works to ensure rapid stabilisation
- Sedimentation and erosion controls, such as earth berms, would be installed in accordance with the CEMP

5.4 CONSTRUCTION IMPACTS

5.4.1 Impact Assessment

Construction of Stage 1 and Stage 2 is expected to take a total of approximately eight days. During this time, the primary construction impacts include the generation of noise and air emissions, disturbance to vegetation requiring rehabilitation and potential sedimentation issues associated with erosion.

All construction impacts are considered to be minor given the location of the proposed works and the small scale of the development. The village of Smiggin Holes has few full time residents during the summer months and receives a very limited number of visitors that are mostly associated with private lodges. The generation of noise and air emissions for the duration of the works would be inconsequential when considered in the context of the trucks, vehicles and machinery that regularly pass through the village area during summer to access the Smiggin Holes stockpile site that is located to the north-east of the subject site.

All areas at the base of the ski area are accessible on foot or 4WD quad bike. There is an existing gravel track that provides vehicle access for Perisher Ski Resort staff to the Smiggin Holes mountain office from the lift maintenance workshop. This is used on an occasional basis and is not accessible to public vehicles. The excavation of this road during Stage 2 of the works would not cause any access problems.

Part of the trench passes through an area that can remain reasonably wet during the summer months and undertaking excavation works in saturated conditions should be avoided to limit the disturbance footprint. Use of the small seven tonne excavator instead of the 22 tonne machine would reduce the ground pressure on the slope and minimise soil impact. It is recommended, however, that an assessment of the condition and saturation levels of the subject site is undertaken prior to works commencing to determine the site suitability. If Perisher Ski Resort has any concerns regarding the appropriateness of undertaking the works at the site, the Department of Planning and Infrastructure would be contacted to advise.

Erosion and sedimentation controls to protect soil movement from stockpiles and any potential sedimentation issues that may impact the water quality of the drainage line underneath Wattle Lodge would be installed if stockpiles are to be left overnight. The risk of this occurring is unlikely due to the site's topography and short construction period but the establishment of controls to protect the drainage line would provide an additional level of protection.

5.4.2 Mitigation measures

A Construction Environment Management Plan (CEMP) and map is included in Appendix F. This plan has been prepared to minimise any impacts of the proposal during construction.

5.5 IMPACTS TO SKI RESORT OPERATIONS

One of the primary reasons for upgrading the electricity network at the base of the Smiggin Holes ski area is to connect all ski lifts and buildings to the main Smiggin Holes switchboard. By undertaking these works, all lifts could be operated from a single backup generator if power failure occurs, enabling a prompt return to resort operations until mains supply is reinstated. This is particularly valuable for the operation of the Kaaten Triple Chairlift which currently relies on a diesel auxiliary motor that must be started independently of all other lifts. Being the only non-surface lift in Smiggin Holes, it is desirable for Kaaten Triple Chairlift to be operational as quickly as possible so that beginner skiers, who may not

necessarily be comfortable riding chairlifts, are not stranded in the air for any length of time. Installation of new electrical infrastructure would result in beneficial impacts for ski resort operations.

6 ENVIRONMENTAL ASSESSMENT – ADDITIONAL ISSUES

6.1 ABORIGINAL CULTURAL HERITAGE

6.1.1 Existing environment

Within the Smiggin Holes ski area, areas assessed as being of high archaeological sensitivity extend along the summit ridge of Mount Piper and along the flatter sections of secondary ridges leading to the summit (Perisher Blue Pty Limited 2002). At the base of Smiggin Holes ski area and within the vicinity of the subject site, there are no areas of archaeological sensitivity. This is confirmed in Figure 6-1 (provided by Shane Trengove, NPWS, 2 March 2011).

Figure 6-1 Archaeological Sensitivity Zones in vicinity of proposed works.

6.1.2 Impact assessment

The proposal is not located in an area that has been assessed as having archaeological sensitivity for Aboriginal artefacts and would be undertaken in land that has been heavily modified through past ski slope developments. The proposed works would not have a significant impact on Aboriginal Cultural Heritage.

6.2 NATURAL AND HISTORIC CULTURAL HERITAGE

6.2.1 Existing environment

Kosciuszko National Park covers an area of 698,000 hectares and includes tableland, montane, sub-alpine and alpine lands (Costin et al. 1979). The park is part of the Australian Alps National Parks which are listed on the National Heritage List (NHL) for their outstanding natural and cultural heritage significance to the nation. Perisher Ski Resort is one of four ski resorts located within the park. Development of Perisher began in the early 1960's and is continuing today.

Throughout the resort areas, a number of lodges that are relics of the earlier years remain in situ. Many of these lodges have been listed on heritage registers for their historical significance. The cultural landscape of the Perisher resort has been determined by the location of lodges and huts established by 1959 during the period of Permissive Occupancy under the Kosciusko State Park Trust (KSPT). The development plan for the area prepared in association with the KSPT embodied the principle that any new development should take place within the boundaries of existing development (Freeman 1998).

6.2.2 Heritage Impacts

Approach

To determine whether there are any additional heritage items within the site, a search for items of Commonwealth or National, State and local significance was conducted. This involved searching the NSW State Heritage Register, the Australian Heritage Database (includes the National and Commonwealth Heritage Lists), the DECCW Historic Heritage Information Management System (HHIMS), and the heritage schedule of the State Environmental Planning Policy (Kosciuszko National Park—Alpine Resorts) 2007.

The cultural heritage values of the ski resorts in NSW have also been covered extensively by the Ski Resorts Heritage Study (SRHS) (Freeman 1998). The main purpose of that report was to develop a thematic heritage study and inventory for those ski resorts and associated structures, and cultural landscapes located within the ski resorts of Kosciuszko National Park. This report has also been searched for the presence of built heritage values in the proposal area.

Impact Assessment

The above searches indicated that no heritage items would be impacted directly by the proposal.

The only building within proximity to the proposal is Wattle Lodge. Although this lodge is not listed on any of the above statutory heritage registers, it is listed as a Schedule 3 item on the SRHS. However, only places listed as Schedule 1 and 2 were considered above the threshold for local, regional or State significance within the resorts area (Freeman 1998).

Wattle Lodge is described by Freeman (1998) as being of a vernacular design and although it is not one of the more significant buildings in the area, it is considered to have some conservation significance and makes at least some contribution to the overall landscape of the Smiggin Holes ski area. However, alterations have occurred to the building where part of the original fabric has been replaced (i.e. new windows, doors and other fittings).

As part of the proposed works, a new power cable would be connected to Wattle Lodge, located on the edge of the carpark at Smiggin Holes. The lodge is adjacent to the ski slopes and has a lift ticket office, kiosk, and has two units upstairs. A small part of a rock wall on the northern side of the building that

would be removed to allow the power cable to be attached to a concrete beam would not impact on the integrity of the building. There would be no other major works to the lodge building.

As the Australian Alps National Parks are listed on the NHL, it is classed as a matter of National Environmental Significance (NES) and is protected under the Commonwealth EPBC Act. Any development that is likely to have a significant impact on an entity listed under this Act is required to receive approval from the Environment Minister before the works can be undertaken. An assessment of impact against the NHL Criteria has considered that the proposal is not likely to have a significant impact on the heritage of the Australian Alps (refer Appendix G). Therefore, referral to the Minister is not required.

Due to the highly modified and disturbed nature of the proposal site, the construction works could not be said to be creating any further impact on items of National, State, or local heritage values. Therefore, it is considered that the current proposal is not considered a significant impact in accordance with the NSW *Heritage Act 1977* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, at least in terms of heritage. No further heritage assessment or approvals are required.

6.3 ENERGY IMPACTS

The ability to operate all ski resort infrastructure from a single switchboard would assist the ongoing management of energy usage in the Smiggin Holes ski area by consolidating usage into a single electricity meter. This would assist financial reporting and all reporting associated with the Environmental Management System.

The Perisher Ski Resort Energy Policy describes the four steps that must be undertaken to manage energy usage throughout the resort. These are to measure, to minimise, to transfer to renewables and to offset (if Steps 2 and 3 are not feasible). The upgrade of electrical infrastructure will simplify the process of measuring the energy usage of the Smiggin Holes ski area and the works are therefore in accordance with this policy.

7 CONCLUSION

The upgrade of electrical infrastructure within the Smiggin Holes ski area is desirable to reduce any potential future problems with the existing old and deteriorating power cables and to improve operational efficiency when power interruptions occur during the winter ski season. The works would require trenching through a heavily modified area that has limited ecological value with no potential to support any threatened species or endangered ecological communities, or to provide suitable habitat for any threatened fauna species. Watercourses would not be disturbed throughout the course of the works and potential erosion risks associated with the disturbance of soil would be adequately managed through the implementation of the relevant mitigation measures. Construction impacts would be minimal given the nature of the works and the scale of the development. There are no cultural heritage issues relating to the proposal.

The proposed works would result in a minor impact to the localised environment that is short term only. The operational benefits derived from undertaking these works is considered to greatly outweigh these impacts.

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APPENDIX A STATUTORY ASSESSMENT CHECKLIST

This section summarises how the relevant statutory requirements for Perisher Ski Resort have been addressed.

A.1 ENVIRONMENT PLANNING AND ASSESSMENT ACT 1979

Table A-1 Matters to be considered under the Environmental Planning and Assessment Act 1979

MATTER	IMPACT/ CROSS REFERENCE
(a) the provisions of any environmental planning instrument (including drafts), development control plans, planning agreements and the regulations	The State Environment Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007 is the instrument of consent and the summary of the proposed works in relation to this planning instrument is included in Table A-2
(b) the likely impacts of the development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	Chapter 4 presents a scoping summary and identifies all potential impacts of the proposed development. Chapter 5 addresses the key environmental issues and Chapter 6 focuses on additional matters
(c) the suitability of the site for the development	Chapter 5 addresses the suitability of the site in terms of vegetation, habitat potential, topography and past history
(d) any submissions made in accordance with this Act or the regulations	N/A. The site is not advertised development
(e) the public interest	The proposal does not raise any issues that would be of public interest

A.2 STATE ENVIRONMENTAL PLANNING POLICY (KOSCIUSZKO NATIONAL PARK – ALPINE RESORTS) 2007

Table A-2 Factors to be considered under the SEPP (Kosciuszko National Park – Alpine Resorts) 2007

FACTOR	IMPACT
(1) In determining a development application that relates to land to which this Policy applies, the consent authority must take into consideration any of the following matters that are of relevance to the proposed development:	
(a) the aim and objectives of this Policy, as set out in clause 2,	The proposed works are in accordance with the aims and the objectives of this Policy, particularly section (1) and section (2)(a). No significant impact on the environment would occur as a result of these works.
(b) the extent to which the development will achieve an appropriate balance between the conservation of the natural environment and any measures to mitigate environmental hazards (including geotechnical	The proposal would take place in an area of that has been totally modified by ski slope development. It has limited conservation values and is not likely to be subjected to

hazards, bushfires and flooding),	environmental hazards. A balance between these two is therefore not necessary
(c) having regard to the nature and scale of the development proposed, the impacts of the development (including the cumulative impacts of development) on the following:	
(i) the capacity of existing transport to cater for peak days and the suitability of access to the alpine resorts to accommodate the development,	The works would not result in any impact on transport around the resort or access to and from the resort
(ii) the capacity of the reticulated effluent management system of the land to which this Policy applies to cater for peak loads generated by the development,	The proposed works would not affect the total visitation levels to the resort at peak times and would therefore have no impact on the operation of this system
(iii) the capacity of existing waste disposal facilities or transfer facilities to cater for peak loads generated by the development,	The development would not generate any additional waste
(iv) the capacity of any existing water supply to cater for peak loads generated by the development	The proposed works would not involve use of the existing water supply.
(d) any statement of environmental effects required to accompany the development application for the development,	This document outlines any environmental impacts associated with the proposal and any mitigation measures if they are required.
(e) if the consent authority is of the opinion that the development would significantly alter the character of the alpine resort - an analysis of the existing character of the site and immediate surroundings to assist in understanding how the development will relate to the alpine resort,	The proposed development would not alter the character of the alpine resort.
(f) the *Geotechnical Policy – Kosciuszko Alpine Resorts (*2003, Department of Infrastructure, Planning and Natural Resources) and any measures proposed to address any geotechnical issues arising in relation to the development,	No geotechnical investigation is required as part of these works.
(g) if earth works or excavation works are proposed – any sedimentation and erosion control measures proposed to mitigate any adverse impacts associated with those works,	A Construction Environment Management Plan is included in Appendix F. Mitigation measures to reduce the impact on soils are included in Chapter 5.
(h) if stormwater drainage works are proposed – any measures proposed to mitigate any adverse impacts associated with those works,	No stormwater drainage works are proposed as part of these works.
(i) any visual impact of the proposed development,	There would be no visible changes to the

particularly when viewed from the Main Range,	surroundings once the works are complete.
(j) the extent to which the development may be connected with a significant increase in activities, outside of the ski season, in the alpine resort in which the development is proposed to be carried out,	The works would not increase summer activities within the resort.
(k) if the development involves the installation of ski lifting facilities and a development control plan does not apply to the alpine resort: (i) the capacity of existing infrastructure facilities, and (ii) any adverse impact of the development on access to, from, or in the alpine resort,	The works do not involve the installation of ski lifting facilities
(l) if the development is proposed to be carried out in the Perisher Range Alpine Resort: (i) the document entitled *Perisher Range Resorts Master Plan*, as current at the commencement of this Policy, that is deposited in the head office of the Department, and (ii) the document entitled *Perisher Blue Ski Resort Ski Slope Master Plan,* as current at the commencement of this Policy, that is deposited in the head office of the Department,	This document relates predominantly to village development and these works are outside the scope of this plan. The development is in accordance to the Perisher Ski Slope Master Plan. This is addressed in Chapter 2.4.7
(m) if the development is proposed to be carried out on land in a riparian corridor: (i) the long term management goals for riparian land (see below), and (ii) whether measures should be adopted in the carrying out of the development to assist with meeting those goals.	The development is to be carried out on land within a riparian corridor. The impacts on this land and associated mitigation measures are addressed in Chapter 5.2
(2) The long term management goals for riparian land are as follows: (a) to maximise the protection of terrestrial and aquatic habitats of native flora and fauna to ensure the provision of linkages, where possible, between such habitats on that land,	
(b) to ensure that the integrity of areas of conservation value and terrestrial and aquatic habitats of native flora and native fauna is maintained,	

(c) to minimise soil erosion and enhance the stability of the banks of watercourses where the banks have been degraded, the watercourses have been channelised, pipes have been laid and the like has occurred.	

A.3 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Table A-3 Matters of National Environmental Significance

MATTER	IMPACT
Matters of National Environmental Significance	
(a) Any environmental impact on a World Heritage Property?	No
(b) Any environmental impact on a National Heritage Place?	Kosciuszko National Park is one of the eleven National Parks within the Australian Alps National Parks and Reserves but the impact on this listed place as a result of the proposed works would be negligible in the context of the existing development.
(c) Any environmental impact on wetlands of international importance?	No
(d) Any environmental impact on Commonwealth listed species or ecological communities?	No
(e) Any environmental impact on Commonwealth listed migratory species	No
(f) Does any part of the proposal involve a nuclear action?	No
(g) Any environmental impact on a Commonwealth Marine Area?	No
(h) Any environmental impact on Commonwealth land	No

APPENDIX B FLORA SURVEY RESULTS

The survey area comprises a 3 metre wide corridor centred on the proposed cable trench routes between the Kaaten Triple Chairlift, the Smiggin Holes mountain office, workshop and Wattle Lodge.

Cover/abundance assessments are based on visual estimates of foliage cover (after Carnahan 1997), and are scored using a modified Braun-Blanquet 6-point scale:

1 1 to a few individuals present, less than 5% cover

2 many individuals present, but still less than 5% cover

3 5 - <20% cover

4 20 - <50% cover

5 50 - <75% cover

6 75 - 100% cover

Cover/abundance scores relate to general abundance over the site, not to representative quadrats. Where the abundance of a particular species varies markedly over the site or stratification unit, a range of cover values is provided.

The unvegetated, gravel parts of the route section passing along the existing access track between the generator room and the workshop have been excluded from the cover estimates.

Where uncertainty exists due to the unavailability of reproductive material, the taxon is preceded by a question mark, or plants are identified to genus level only. Introduced species are denoted by an asterisk. Species of conservation significance are bolded. Scientific nomenclature follows Harden (1990-2002) and the Sydney Royal Botanic Gardens PlantNet website.

Table B-1 Flora species list

Scientific name	Common name	Family	Abundance
Forbs			
**Taraxacum officinale*	Dandelion	Asteraceae	1
**Trifolium repens*	White Clover	Fabaceae	3
**Trifolium* sp	Clover	Fabaceae	1
Grasses			
**Agrostis capillaris*	Brown-top Bent	Poaceae	4
**Dactylis glomerata*	Cocksfoot	Poaceae	2-3
**Festuca rubra* ssp *rubra* **Festuca nigrescens*	Red Fescue Chewings Fescue	Poaceae	4
**Phleum pratense*	Timothy Grass	Poaceae	2-4
Graminoids			
Carex echinata	Star Sedge	Cyperaceae	0-3
Carex gaudichaudiana	Tufted Sedge	Cyperaceae	2-4
**Juncus articulatus*	Jointed Rush	Juncaceae	1
**Juncus effusus*	Soft Rush	Juncaceae	1
Juncus falcatus	Sickle-leaf Rush	Juncaceae	0-3
Luzula modesta	Bog Woodrush	Juncaceae	1
Non-vascular plants			
Sphagnum cristatum	Sphagnum Moss	Sphagnaceae	1

APPENDIX C EPBC PROTECTED MATTERS SEARCH

Australian Government
Department of Sustainability, Environment, Water, Population and Communities

Protected Matters Search Tool

EPBC Act Protected Matters Report: Coordinates

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

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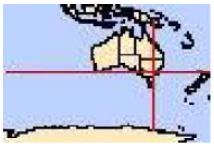
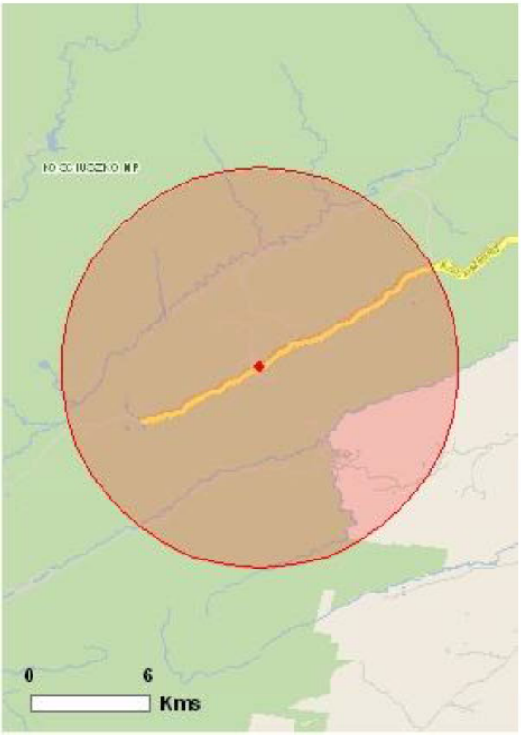




This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Summary

Details

Matters of NES

Other matters protected by the EPBC Act

Extra Information

Caveat

Acknowledgements

Coordinates
Buffer: 10Km

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html.

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Significance (Ramsar Wetlands):	7
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communitites:	3
Threatened Species:	17
Migratory Species:	12

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage/index.html

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.au/epbc/permits/index.html.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	11

Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Report Summary for Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	6
State and Territory Reserves:	1
Regional Forest Agreements:	1
Invasive Species:	12
Nationally Important Wetlands:	1

Details

Matters of National Environmental Significance

National Heritage Places [Resource Information]

Name	Status
Natural	
Australian Alps National Parks and Reserves	Listed place
Historic	
Snowy Mountains Scheme NSW	Nominated place

Wetlands of International Significance (RAMSAR Sites) [Resource Information]

Name	Proximity
Coorong and lakes alexandrina and albert	Upstream from Ramsar site
Banrock station wetland complex	Upstream from Ramsar site
Riverland	Upstream from Ramsar site
Nsw central murray state forests	Upstream from Ramsar site
Gunbower forest	Upstream from Ramsar site
Blue lake	Within 10km of Ramsar site
Barmah forest	Upstream from Ramsar site

Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area
Alpine Sphagnum Bogs and	Endangered	Community likely to occur within area

Associated Fens		
Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory	Endangered	Community may occur within area

Threatened Species		**[Resource Information]**
Name	Status	Type of Presence
BIRDS		
Lathamus discolor		
Swift Parrot [744]	Endangered	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
FISH		
Maccullochella peelii peelii		
Murray Cod, Cod, Goodoo [68443]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica		
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
FROGS		
Litoria raniformis		
Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat may occur within area
Litoria verreauxii alpina		
Alpine Tree Frog, Verreaux's Alpine Tree Frog [66669]	Vulnerable	Species or species habitat likely to occur within area
Pseudophryne corroboree		
Southern Corroboree Frog [1915]	Endangered	Species or species habitat likely to occur within area
MAMMALS		
Burramys parvus		
Mountain Pygmy-possum [267]	Endangered	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Potorous tridactylus tridactylus		
Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys fumeus		
Konoom, Smoky Mouse [88]	Endangered	Species or species habitat may occur within area
PLANTS		
Argyrotegium nitidulus		
Shining Cudweed [82043]	Vulnerable	Species or species habitat likely to occur within area
Calotis glandulosa		
Mauve Burr-daisy [7842]	Vulnerable	Species or species habitat likely to occur within area

Ranunculus anemoneus Anemone Buttercup [14889]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
REPTILES		
Cyclodomorphus praealtus Alpine She-oak Skink [64721]	Endangered	Species or species habitat likely to occur within area

Migratory Species		**[Resource Information]**
Name	Status	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Breeding may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		**[Resource Information]**
Name	Status	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area

Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Breeding may occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]		Species or species habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	Status
Natural	
Jagungal Wilderness Area NSW	Registered
Kosciuszko Alpine Area NSW	Registered
Kosciuszko National Park (1981 boundary) NSW	Registered
Mount Kosciuszko Glaciated Area NSW	Registered
Historic	
Illawong Lodge NSW	Registered
Snowy Mountains Scheme NSW	Registered

State and Territory Reserves [Resource Information]

Kosciuszko, NSW

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Southern RFA, New South Wales

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Mammals		
Capra hircus		

Goat [2]	Species or species habitat may occur within area
Felis catus	
Cat, House Cat, Domestic Cat [19]	Species or species habitat likely to occur within area
Oryctolagus cuniculus	
Rabbit, European Rabbit [128]	Species or species habitat likely to occur within area
Sus scrofa	
Pig [6]	Species or species habitat likely to occur within area
Vulpes vulpes	
Red Fox, Fox [18]	Species or species habitat likely to occur within area
Plants	
Asparagus asparagoides	
Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]	Species or species habitat may occur within area
Genista sp. X Genista monspessulana	
Broom [67538]	Species or species habitat may occur within area
Lycium ferocissimum	
African Boxthorn, Boxthorn [19235]	Species or species habitat may occur within area
Pinus radiata	
Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]	Species or species habitat may occur within area
Rubus fruticosus aggregate	
Blackberry, European Blackberry [68406]	Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtiji	
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]	Species or species habitat may occur within area
Ulex europaeus	
Gorse, Furze [7693]	Species or species habitat may occur within area
Nationally Important Wetlands	**[Resource Information]**
Blue Lake (Kosciuszko), NSW	

APPENDIX D SIGNIFICANT FLORA EVALUATION

The following table lists the significant flora species recorded within the Kosciuszko 1:100,000 map sheet area and nearby high subalpine habitats, and evaluates the potential for the species to occur within the vicinity of the subject site and the potential to be impacted by the works.

Table D-1 Significant flora species

Species	Habitat required	Potential to occur in area	Potential to be impacted by works
Threatened species			
Argyrotegium nitidulum Shining Cudweed Asteraceae TSC Act – Vulnerable EPBC Act – Vulnerable	Mat-forming perennial forb with small silver leaves, restricted to the alpine zone. The elevation and habitats at the subject site are not likely to be suitable for this species.	Nil	Nil
Carex archeri Archer's Sedge Cyperaceae TSC Act – Endangered EPBC Act – not listed	Rare perennial rhizomatous sedge with two old records in the park, one at Club Lake. The elevation and habitats at the subject site are not likely to be suitable for this species.	Nil	Nil
Carex raleighii Raleigh's Sedge Cyperaceae TSC Act – Endangered EPBC Act – not listed	Perennial rhizomatous sedge recorded in valley bog near Charlotte Pass, and elsewhere in wet grassland alongside streams in the sub-alpine zone and in frost-hollow grasslands below an inverted treeline.	Nil	Nil
Discaria nitida Leafy Anchor Plant Rhamnaceae TSC Act – Vulnerable EPBC Act – not listed	Shrub 2-5m high inhabiting rocky situations, usually along streams in sand or gravel, in the Snowy Mountains above 1000m (Harden 1990). Also occupies non-rocky areas of stream bank in sub-alpine areas and in frost-hollow grasslands along streams, where there is long-term protection from fires (such as on islands in the stream bed) (J. Miles, pers. obs.). High elevation and exposure to fire make the site unsuitable for this species.	Nil	Nil
Diuris pedunculata Small Snake Orchid Orchidaceae TSC Act – Endangered EPBC Act – Endangered	A terrestrial 'donkey' orchid growing on grassy slopes or flats, chiefly from Port Jackson to Tenterfield. Flowers August-October. There is a January 1975 Atlas record (RBG) near Smiggin Holes, although the high elevation and flowering period of this record are not typical.	Nil	Nil
Euphrasia scabra Rough Eyebright Scrophulariaceae TSC Act – Endangered EPBC Act – not listed	Small erect annual herb 8-50cm high with yellow flowers with old records from Yarrangobilly, Tumbarumba and Jindabyne and recent records from the coastal escarpment. Inhabits wet grassy areas around bogs. May be extinct in the park. High elevation makes the site unsuitable for this species.	Nil	Nil
Irenepharsus magicus Elusive Cress Brassicaceae TSC Act – Endangered EPBC Act –not listed	An erect annual or biennial herb, with deciduous basal leaves and small, white flowers in Autumn. Confined to montane elevations in the Geehi Valley.	Nil	Nil

Species	Habitat required	Potential to occur in area	Potential to be impacted by works
Leucochrysum albicans ssp *albicans* var *tricolor* Hoary Sunray Asteraceae TSC Act – not listed EPBC Act –Vulnerable	Tufted perennial forb with narrow silver leaves found in drier grasslands and grassy woodlands of the Southern Tablelands. The site is too high for this subspecies. Subspecies *alpinum* occurs in the alpine zone.	Nil	Nil
Pilularia novae-hollandiae Austral Pillwort Marsileaceae TSC Act – Endangered EPBC Act –not listed	A semi-aquatic fern, with grass-like fronds to 8cm, and small, spherical fruiting capsules at the base of fronds. Recorded in the Main Range alpine zone.	Nil	Nil
Prasophyllum morganii Cobungra Leek Orchid Orchidaceae TSC Act – Vulnerable EPBC Act – Vulnerable	A leek orchid with green flowers in December, recorded in the Kiandra area. It prefers gently undulating ground, often near creeks, in alpine herbfield (Bishop 1996). In Victoria it grows in sub-alpine meadows or open snow gum woodland. Habitat at the site is unsuitable.	Nil	Nil
Prasophyllum retroflexum Orchidaceae TSC Act – Vulnerable EPBC Act – not listed	A recently described leek orchid apparently restricted to the Tantangara-Kiandra-Yarrangobilly area. It grows on gentle slopes in sub-alpine herbfield and flowers in November-December. Habitat at the site is unsuitable.	Nil	Nil
Pterostylis oreophila Blue-tongued Greenhood Orchidaceae TSC Act – Critically Endangered EPBC Act – not listed	A terrestrial orchid with a solitary, erect flower from November to January. In NSW, recorded from Kiandra and a small (possibly now extinct) population at Bago State Forest south of Tumut. Grows along watercourses under *Leptospermum grandifolium* in muddy ground very close to water, and less commonly in peaty soils and sphagnum mounds. There is a 1972 Atlas record near Dainer's Gap, although this record is not referenced in the TSC listing and DECCW species profile.	Nil	Nil
Ranunculus anemoneus Anemone Buttercup Ranunculaceae TSC Act – Vulnerable EPBC Act – Vulnerable	Perennial forb with large leathery leaves, restricted to the alpine and upper sub-alpine zones, usually at sites with prolonged snow cover. Recorded on slopes above Perisher village. The site is not likely to be suitable for this species. It is perennial, large and very distinctive and would have been recorded during the site survey if present.	Nil	Nil
Rutidosis leiolepis Monaro Golden Daisy Asteraceae TSC Act – Vulnerable EPBC Act – Vulnerable	Perennial tufted forb 10-30cm high growing in higher altitude grassland of the Cooma and Kiandra districts (Harden 1992). Suitable habitat (natural temperate grassland) is not present.	Nil	Nil
Rytidosperma pumilum Feldmark Grass Poaceae TSC Act – Vulnerable EPBC Act – Vulnerable	Inconspicuous tufted grass to 7cm inhabiting exposed feldmark in the alpine zone. The site is too low and herbfield community inappropriate for this species.	Nil	Nil

Species	Habitat required	Potential to occur in area	Potential to be impacted by works
Rytidosperma vickeryae Perisher Wallaby Grass Poaceae TSC Act – Endangered EPBC Act – not listed	A small perennial grass to 0.3 m high, with tufts of leaves on rhizomes. Leaves are about 2 mm wide, open at base. Widely-spreading inflorescence to 4 cm long. Grows in Sphagnum bogs, stream edges or on gravelly or rocky ground at 1500-1900 metres ASL. Recorded around Perisher, especially beside creeks. Also known from Happy Jacks Plain.	Nil	Nil
Thesium australe Austral Toadflax Santalaceae TSC Act – Vulnerable EPBC Act – Vulnerable	Perennial herb to about 40cm high growing in grassland and woodland, where it is parasitic on grasses, particularly kangaroo grass. It shows a preference for moist areas. Suitable habitat (natural temperate grassland and woodland with Kangaroo Grass) is not present.	Nil	Nil
Endangered Ecological Communities			
Montane Peatlands and Swamps TSC Act – Endangered community	Variable community which may be dominated by herbaceous species (sedges, grasses, forbs) or shrubs, occurring in drainage depressions and seepage areas of the NSW tablelands to alps.	Nil	Nil
Alpine Sphagnum Bogs and Associated Fens EPBC Act – Endangered community	Ecological community of restricted distribution in alpine, subalpine and montane environments. Often associated with the climatic treeline. The community can usually be defined by the presence or absence of sphagnum moss, but this is not normally the dominant species	Nil	Nil
Species listed in the Kosciuszko National Park Plan of Management (DEC 2006)			
Derwentia nivea Mountain Speedwell Scrophulariaceae Poorly known, possibly threatened	Small shrub inhabiting alpine and sub-alpine grassland, heath, bogs and woodland in Kosciuszko area, mostly 1500-2000m ASL (Harden 1992). Occurs at SW Perisher and Smiggin Holes (P McPherson pers. obs.).	Nil	Nil
Euphrasia sp 3 Scrophulariaceae Less than 6 populations recorded	Recorded on Ramshead Range in the Kosciuszko alpine zone.	Nil	Nil
Hierochloe submutica Spreading Holy Grass Poaceae Poorly known, possibly threatened	Favours moist sites in tall alpine herbfield and near bog margins (Costin et al. 1979). Recorded in grassy snow gum woodland near Pipers Creek and Pipers Saddle in earlier surveys. Not recorded at site.	Nil	Nil
Pelargonium helmsii Stork's-bill Geraniaceae Poorly known, possibly threatened	Perennial herb inhabiting heath in alpine and sub-alpine tracts. Recorded in post-fire woodland at Guthega. Nomination for listing under the TSC Act prepared. Not recorded at site.	Nil	Nil
Ranunculus clivicola Hill Buttercup Ranunculaceae Poorly known, possibly threatened	Mainly associated with bogs, but also found near streams in tall alpine herbfield and sod tussock grassland (Costin et al. 1979).	Nil	Nil

Species	Habitat required	Potential to occur in area	Potential to be impacted by works
Ranunculus productus Rare Buttercup Ranunculaceae Poorly known, possibly threatened	Perennial herb inhabiting wet montane and subalpine grassland (Harden 1990). Flowers summer. Recorded at Dainer's Gap and near Smiggin Holes.	Nil	Nil

APPENDIX E SIGNIFICANT FAUNA EVALUATION

The following table lists the significant fauna species recorded within the Kosciuszko 1:100,000 map sheet area and nearby high subalpine habitats, and evaluates the potential for the species to occur within the vicinity of the subject site and to be impacted by the works.

Table E - 1 Significant fauna species

Species	Habitat required	Potential to occur in area	Potential to be impacted by works
Amphibia			
Litoria verreauxii alpine Alpine Tree Frog *Hylidae* TSC Act - Endangered EPBC Act - Vulnerable	This species is found in a wide variety of habitats including woodland, heath, grassland and herb fields at high elevation (DECCW 2010). It breeds in natural and artificial wetlands including ponds, bogs, fens, streamside pools, stock dams and drainage channels that are still or slow flowing. Non-breeding habitat and overwintering refuges are poorly known but are likely to include flat rocks, fallen logs, leaf litter and other ground debris.	Low Possible, but unlikely	Nil
Pseudophryne corroboree Southern Corroboree Frog *Myobatrachidae* TSC Act – Critically Endangered EPBC Act - Endangered	The summer breeding habitat for this species is pools and seepages in sphagnum bogs, wet tussock grasslands and wet heath (DECCW 2010) Males move into the breeding sites in summer and call during January and February from covered depressions or mossy chambers at the edges of pools. Outside the breeding season adults move away from the bogs into the surrounding heath and snow gum woodland to overwinter under litter, logs and dense groundcover (DECCW 2010)	Nil	Nil
Litoria spenceri Spotted Tree Frog *Hylidae* TSC Act – Critically Endangered	Occur among boulders or debris along naturally vegetated, rocky fast flowing upland streams and rivers.	Nil	Nil
Aves			
Hieraaetus morphnoides Little eagle Accipitridae TSC Act - Vulnerable	Found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used. It nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter (DECCW 2011)	Nil	Nil
Callocephalon fimbriatum Gang-gang Cockatoo *Cacatuidae* TSC Act - Vulnerable	In summer, this species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, it may occur at lower altitudes in drier, more open eucalypt forests and woodlands, and is often found in urban areas (DECCW 2011)	Low	Nil

Species	Habitat required	Potential to occur in area	Potential to be impacted by works
Climacteris picumnus Brown Treecreeper *Climacteridae* TSC Act - Vulnerable	Endemic to eastern Australia, the species is found in Eucalypt woodlands and dry open forest of the inland slopes and plains inland of the Great Dividing Range. The eastern sub species is found in drier open woodlands including the Snowy River Valley Fallen timber is an important habitat component for foraging, hollows are essential for nesting (DECCW 2011)	Nil	Nil
Stagonopleura guttata Diamond Firetail *Estrildidae* TSC Act - Vulnerable	This species is found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Woodlands, concentrated on the tablelands and western slopes of NSW. It also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. It is often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Birds roost in dense shrubs or in smaller nests built especially for roosting (DECCW 2010).	Nil	Nil
Pachycephala olivacea Olive Whistler *Pachycephalidae* TSC Act - Vulnerable	This species inhabits the wet forests on the ranges of the east coast. It has a disjunct distribution in NSW chiefly occupying the beech forests around Barrington Tops and the MacPherson Ranges in the north and wet forests from Illawarra south to Victoria. In the south it is found inland to the Snowy Mountains and the Brindabella Range. Mostly inhabit wet forests above about 500m. During the winter months they may move to lower altitudes (DECCW 2010).	Low	Nil
Melanodryas cucullata Hooded Robin *Petroicidae* TSC Act - Vulnerable	This species usually occupies open eucalypt woodlands, Acacia scrublands and mallee. It is widespread, occurring in pairs or solitary in lightly wooded country (DECCW 2011)	Nil	Nil
Petroica boodang Scarlet Robin *Petroicidae* TSC Act - Vulnerable	This species occurs from south-east Queensland to south-east Australia and Tasmania from the coast to the inland slopes. Prefers dry eucalypt forests and woodlands with an open grassy understorey and few shrubs. Breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions. Occasionally found up to 1000m altitude.	Nil	Nil
Petroica phoenicea Flame Robin *Petroicidae* TSC Act - Vulnerable	This species is endemic to SE Australia ranging from near the Queensland border to Tasmania. It breeds in upland tall moist eucalypt forests and woodlands often on ridges and slopes. Occasionally occurs in temperate rainforest and also in herbfields, heathlands, shrublands and sedgelands at high altitudes (DECCW 2010)	Nil	Nil
Petroica rodinogaster Pink Robin *Petroicidae* TSC Act - Vulnerable	This species is found in Tasmania and the uplands of eastern Victoria and far south-eastern NSW, almost as far north as Bombala. On the mainland, the species disperses north and west and into more open habitats in winter, regularly as far north as the ACT area, and sometimes being found as far north as the central coast of NSW. Inhabits rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies	Nil	Nil

Species	Habitat required	Potential to occur in area	Potential to be impacted by works
Ninox strenua Powerful Owl *Strigidae* TSC Act - Vulnerable	This species is endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria. In NSW, it is widely distributed throughout the eastern forests from the coast inland to the tablelands, with scattered, mostly historical records on the western slopes and plains. The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well (DECCW 2010).	Nil	Nil
Gallinago hardwickii Latham's Snipe EPBC Act - Migratory	Occurs in a wide variety of permanent and ephemeral wetlands and usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby (DSEWPC 2011)	Nil	NIl
Tyto tenebricosa Sooty Owl *Tytonidae* TSC Act - Vulnerable	This species occurs on the coast, coastal escarpment and eastern tablelands. It occurs in dry, subtropical and warm temperate rainforests as well as moist eucalypt forests. It nests in very large tree- hollows (DECCW 2011)	Nil	Nil
Mammalia			
Burramys parvus Mountain Pygmy-possum *Burramyidae* TSC Act – Vulnerable EPBC Act - Endangered	Lives on the ground in rocky areas where boulders have accumulated below mountain peaks; frequently associated with alpine heath land shrubs dominated by the Mountain Plum-pine. The only Australian mammal to be entirely restricted to the alpine zone in areas above the winter snowline; it is dependent on the insulation provided by snow for its survival.	Nil	Nil
Cercartetus nanus Eastern Pygmy-possum *Burramyidae* TSC Act - Vulnerable	This species is found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest (DECCW 2010). This species uses a variety of shelters, such as tree hollows, rotten stumps, and holes in the ground, abandoned bird-nests, Ringtail Possum drays or thickets of vegetation, (e.g. grass-tree skirts).	Nil	Nil
Dasyurus maculates Spotted-tailed Quoll *Dasyuridae* TSC Act - Vulnerable EPBC - Endangered	This species is found in a variety of habitat types including rainforest, open forest, woodland, coastal heath and inland riparian forest from the subalpine zone to the coastline. Species requires hollow bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites (DECCW 2011)	Low	Nil
Dasyurus viverrinus Eastern Quoll *Dasyuridae* TSC Act - Endangered	This species occurs in dry sclerophyll forest, scrub, heathland and cultivated land. There are two recorded species within the Kosciuszko 1:100 000 mapsheet area but there have been no recent sightings of this species within NSW (DECCW 2011)	Nil	Nil

Species	Habitat required	Potential to occur in area	Potential to be impacted by works
Phascogale tapoatafa Brush-tailed Phascogale *Dasyuridae* TSC Act - Vulnerable	This species prefers dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. It also inhabits heath, swamps, rainforest and wet sclerophyll forest. Nest and shelter is found in tree hollows with entrances 2.5 - 4 cm wide and uses many different hollows over a short time span (DECCW 2010).	Nil	Nil
Mastacomys fuscus Broad-toothed Rat *Muridae* TSC Act - Vulnerable	This species lives in a complex of runways through the dense vegetation of wet grass, sedge or heath environment, and under the snow in winter. Nests of grass are built in the understorey or under logs. The diet consists almost solely of grass and sedge stems, supplemented by seeds and moss spore cases (DECCW 2010).	Low Possible, but unlikely	Nil
Isoodon obeslus obesulus Southern Brown Bandicoot (eastern) *Peramelidae* TSC Act - Vulnerable	This species has a patchy distribution. It is found in south-eastern NSW, east of the Great Dividing Range and south from the Hawkesbury River. It prefers heath or open forest with a heathy understorey on sandy or friable soils.	Nil	Nil
Petaurus australis Yellow-bellied Glider *Petauridae* TSC Act - Vulnerable	This species is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. It occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. (DECCW 2010).	Nil	Nil
Phascolarctos cinereus Koala *Phascolarctidae* TSC Act - Vulnerable	This species inhabits eucalypt woodlands and forests over a broad but fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In NSW it mainly occurs on the central and north coasts, they are also know from several sites on the southern tablelands (DECCW 2008).	Nil	Nil
Falsistrellus tasmaniensis Eastern False Pipistrelle *Vespertilionidae* TSC Act - Vulnerable	This species prefers moist habitats, with trees taller than 20 m (DECCW 2008). Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	Low	Nil
Miniopterus schreibersii oceanensis Eastern Bentwing-bat *Vespertilionidae* TSC Act - Vulnerable	This species primarily roosts in caves, but also uses derelict mines, storm-water tunnels, buildings and other man-made structures (DECCW 2010). It forms discrete populations centred on a maternity cave that is used annually in spring and summer. At other times of the year, populations disperse within about 300 km range of maternity caves.	Low	Nil

Species	Habitat required	Potential to occur in area	Potential to be impacted by works
Reptiles			
Varanus rosenbergi Rosenberg's Goanna *Varanidae* TSC Act - Vulnerable	Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component.	Nil	Nil
Species listed in the Kosciuszko National Park Plan of Management (DECC 2006)			
Cyclodomorphus praeltus Alpine She-oak Skink *Scincidae* EPBC Act - Endangered	Species is restricted to the tussock grassland within the Kosciuszko region (DSEWPC 2011)	Nil	Nil
Eulamprus kosciuskoi Alpine Water Skink *Scincidae* *Restricted distribution*	This species is common throughout Kosciuszko National Park above 1700m. It is restricted to wet heath and Sphagnum bog or alpine wetlands.	Nil	Nil

APPENDIX F CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

This Construction Environmental Management Plan (CEMP) outlines the site specific measures that would be implemented to manage any potential environmental impacts that may result from the proposed electrical upgrade works. It aims to provide construction personnel with a clear, concise and practical environmental management plan and has been prepared with consideration of Appendix A, Environmental Best Practice Manual, in the Perisher Ski Slope Master Plan (Perisher Blue Pty Limited 2002).

F.1 SITE SPECIFIC MEASURES

Figure F-1 illustrates the site specific measures that are relevant to the proposed works. These are described in the following section.

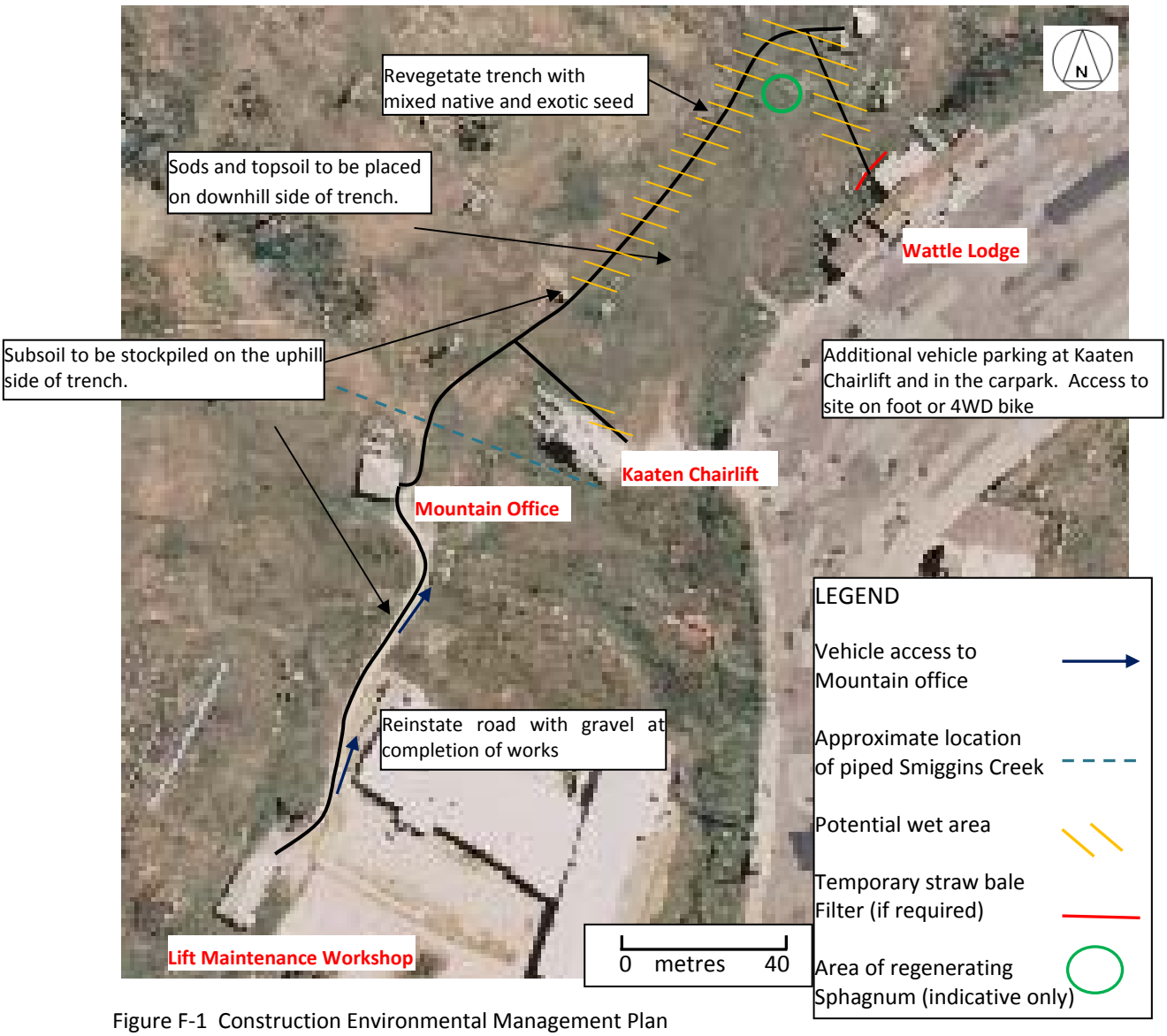


Figure F-1 Construction Environmental Management Plan

F.1.1 Machinery

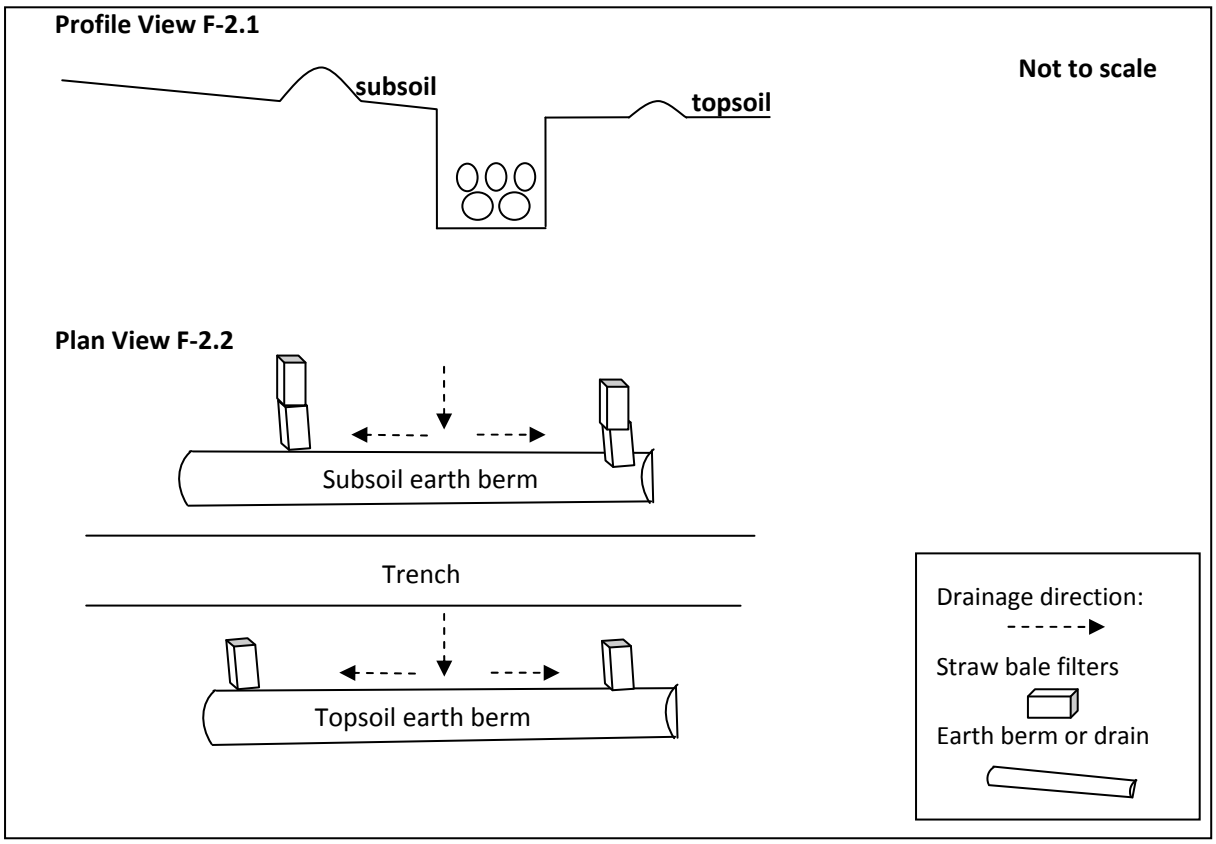
- The works would be undertaken by a seven tonne excavator. The only other machinery required on site may be a backhoe to spread gravel when reinstating the access road to the Smiggin Holes mountain office and a HD carrier to remove any excess spoil or rock fragments that may be generated by the works.

F.1.2 Access and parking

- Excavator and vehicle access would be along the gravel road that exists between the lift maintenance workshop and the Smiggin Holes mountain office.
- Access to all other parts of the site is by foot or 4WD bike.
- Vehicle parking would be available near Kaaten Triple Chairlift and in the Smiggin Holes carpark.

F.1.3 Trenching works

- If possible, the trenching works would be completed in sections that can be opened and closed within a day to minimise the time that spoil from the trench must be stockpiled. Ideally, the trench would be rehabilitated at the end of each day to reduce the potential for erosion to occur. If this is not practical, the rehabilitation would take place immediately after completion of the works.
- Topsoil and sods would be placed on the downhill side of the trench and would be separated from the subsoil which would be stored on the uphill side of the trench, as per diagram F-2.1 below.



F-2 Profile and plan view of trenching works.

- If immediate rehabilitation is not practicable, a small proportion of the topsoil would be retained on the downhill side of the trench to maintain an earth berm. Turbid runoff from this would be treated with straw bales, as per Figure F-2.2.
- Where the trench is left open for extended periods of time (more than 24 hours) or when there is a risk of rainfall, weed free straw bales should be installed to treat sediment laden runoff (see Figure F-3). Given the flat nature of the site, any runoff is expected to be minimal.
- The works would not be undertaken during periods of heavy rain or if rain or storms are forecast.
- The trench would move slightly upslope towards the Scott and Captain Cook J-Bars to avoid an area of regenerating sphagnum moss.
- Excavation of the trench in the vicinity of the Smiggins Creek piped culvert would be undertaken in a careful manner to avoid potential damage. If the culvert is exposed, the trench would be excavated by hand and the conduits installed below the culvert.
- Any trenches that must be left open overnight would have an inclined piece of timber placed in the trench for animals to use as an escape ramp and would be inspected each morning for trapped fauna. If found, animals would be removed from the trench and released into suitable habitat

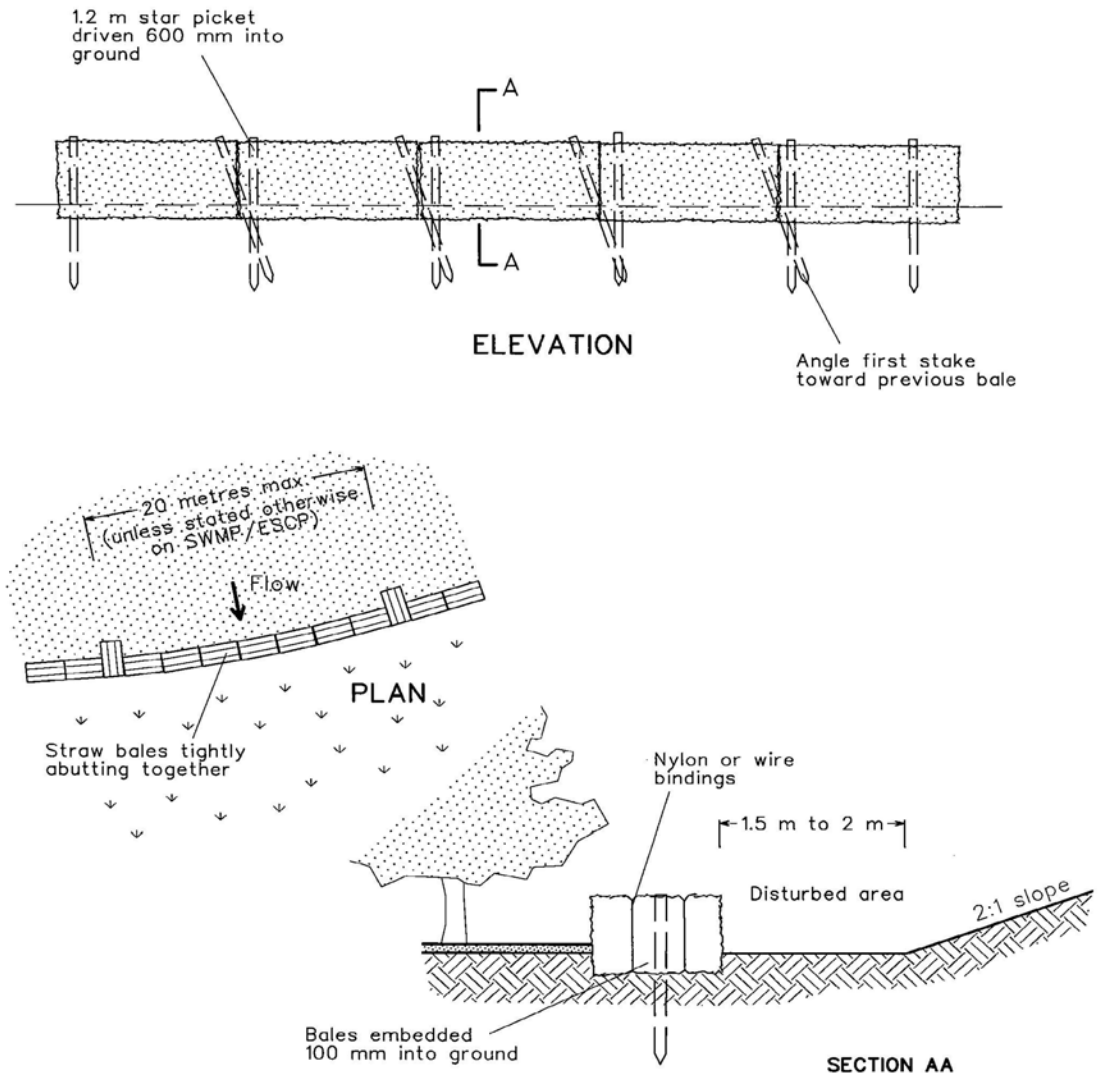
F.1.4 Revegetation works

- On completion of the stage 1 works, the disturbed area would be revegetated with a mixture of *Poa fawcettiae* and Chewings fescue seed. If *Poa costiniana* seed is available, this would be used in the wetter areas in the north-eastern part of the site
- On completion of the stage 2 works, the disturbed road would be reinstated with gravel.

F.1.5 General

- If there are any concerns regarding the condition and suitability of the subject site, particularly in relation to the dampness of the ground in the north-eastern part of the site, the Department of Planning and Infrastructure would be consulted prior to the works commencing.
- The works should apply a high level of weed hygiene to prevent the introduction and spread of environmental weeds at the site.

Straw bale filter construction notes (Source: "The Blue Book" 2004)



Construction Notes

1. Construct the straw bale filter as close as possible to being parallel to the contours of the site.
2. Place bales lengthwise in a row with ends tightly abutting. Use straw to fill any gaps between bales. Straws are to be placed parallel to ground.
3. Ensure that the maximum height of the filter is one bale.
4. Embed each bale in the ground 75 mm to 100 mm and anchor with two 1.2 metre star pickets or stakes. Angle the first star picket or stake in each bale towards the previously laid bale. Drive them 600 mm into the ground and, if possible, flush with the top of the bales. Where star pickets are used and they protrude above the bales, ensure they are fitted with safety caps.
5. Where a straw bale filter is constructed downslope from a disturbed batter, ensure the bales are placed 1 to 2 metres downslope from the toe.
6. Establish a maintenance program that ensures the integrity of the bales is retained - they could require replacement each two to four months.

STRAW BALE FILTER **SD 6-7**

Figure F-3 Design of temporary straw bale filters (if required).

F.2 ENVIRONMENTAL 'BEST PRACTICES'

Relevant 'best practices' as listed in Appendix A of the SSMP (Ref. 2) are as follows:

Activity	Guideline	Description
Movement on tracks		
Types of vehicles used	2.1 A.1, A.2, A.4	**A.1 Sealed roads** This applies mainly to movement on sealed roads and carparks en route to works, as roads within the ski slopes are generally unsealed. Any type of vehicle may be used with the exception of tracked vehicles which are transported by low loader over sealed roads to protect the pavement from damage by tracks. Alternatively, pavement protection against tracked vehicles can be achieved by placing rubber mats, old tyres or timber under the tracks progressively as the vehicles are moved slowly. **A.2 Unsealed roads other than Blue Cow Road** Any type of vehicle may be used, subject to length and width constraints in the case of heavy vehicles. **A.4 Stable access tracks** Four-wheel-drive motorbikes are used for routine activities, with more limited use of medium-weight four-wheel-drive vehicles. Tracked vehicles may be used for specific projects, with the number of passages kept to a minimum. Tracked vehicle operators should perform multiple point turns on sharp bends to reduce damage to the track surface. Suitable heavy vehicles are used only in exceptional situations, e.g. when essential for delivery of materials or for undertaking earthworks.
Monitoring of use	2.1/B.2	**B.2 Other tracks and roads** The condition of all tracks and roads should be observed on a regular basis with any problems reported to the Mountain Manager for appropriate action (or referral to NPWS if it is responsible for the road).
Travel speeds	2.1/D.1, D.2	**D.1 Public roads** Maximum travel speeds must be in accordance with legal limits or lower as conditions dictate. **D.2 Access tracks** Travel speeds must be limited to the point that: • the driver is in total control of the vehicle at all times; • a safe stopping distance is maintained, particularly in sections of restricted visibility: • the safety and comfort of pedestrians or cyclists using the track is maintained; and • excessive wear on the track is avoided.
Movement off tracks		
Types of vehicles used	2.2/A.1, A.4	**A.1 Exotic ground cover, moderate, well-drained slope** Access may be by light- or medium-weight four wheel-drive vehicle, four-wheel-drive motorbike or tracked vehicle. The amount of traffic should be kept as low as practicable, with motorbikes preferred for personal access. Unnecessary turning of tracked vehicles should be avoided. If the number of movements is low enough, the movement paths should be varied to avoid concentrating impacts. If these movements would cause significant disturbance over a wide area, however, it is preferable to concentrate traffic along a single route and to rehabilitate the route at the conclusion of the works. **A.4 Wet grassland, transitional heath**

Activity	Guideline	Description
		Access should be by motorbike, tracked vehicle or, subject to suitable gradient, light-weight four-wheeldrive vehicle. The amount of traffic should be kept as low as practicable, with motorbikes preferred for personal access. Unnecessary turning of tracked vehicles should be avoided. The total volume of traffic should be limited to avoid creating a situation requiring rehabilitation. Access should be limited to periods when the ground is sufficiently dry to avoid being disturbed by the volume of traffic anticipated.
Monitoring of impacts	2.2/C.1	**C.1 All situations** At the conclusion of a project or maintenance task, the condition of all areas used for off-track access should be monitored for evidence of disturbance. If any significant disturbance has occurred, this shall be rehabilitated as soon as practicable in accordance with Chapter 6 of these guidelines.
Fuel, oil and related hydrocarbons		
Design of fuel handling areas	3.1/A.3	**A.3 Field construction sites** In general, fuel should not be stored in the field but should be brought in on a daily basis or as required. If it is essential to maintain a field store for operational reasons, this should be located in an impermeable bunded area with a capacity of 110 percent of the volume stored, in accordance with WorkCover and EPA requirements
Storage, transport and refuelling procedures	3.1/ B.1, B.6	**B.1 Mountain workshops** Fuel and oil should be stored and handled within those areas designated for this purpose. Safety procedures should be followed in accordance with the Perisher Blue Risk Management Manual **B.6 Mobile equipment** If it is not practicable to return mobile equipment to a workshop for refuelling, it should be refuelled from a truck fitted with a small tank (e.g. 600 litres) and a hand pump. Pumping must be done carefully to avoid overfilling.
Handling of spillages	3.1/ C.2	**C.2 In the field** All vehicles involved with handling of fuel in the field should carry a clean-up kit with instructions to deal with minor spillages (up to 20 litres). Major spillages should be handled by calling the Clean-up Response Team based at the main workshop or, if necessary, the Fire Brigade, which has Hazchem kits.
Planning and design of erosion and sediment control works		
Overall design	4.1/ A.2	**A.2 Medium to small development sites** For medium to small development sites (e.g. small area of fill on a ski slope, small building) which can be completed relatively quickly, controls such as a diversion drain or major silt trap may have an environmental impact comparable with the project itself. In this situation, sediment control should be limited to minor diversion works, if inflow is significant, and/or temporary trapping techniques such as haybale or geotextile barriers, and greater emphasis placed on non-structural approaches such as rapid execution of the project and immediate rehabilitation of the affected area.
Sediment control		
General installation	4.3/ A.1	**A.1 Haybale barriers** Haybale barriers are an effective temporary measure for trapping sediment, provided that they are installed correctly. The method of installing them will depend on the nature of the ground surface. If the ground surface and vegetation cover is fairly even, the vegetation should be tamped down and the haybales placed firmly and tightly on the ground surface. If the ground surface is irregular, they should be set in a shallow (100 mm) trench. If there is concern about the stability of the barrier (e.g. in a watercourse or on a steep slope),

Activity	Guideline	Description
		the haybales should be secured by stakes. It is preferred to locate haybale barriers on flatter slopes for stability and to reduce the impacts of installing them.
Type and location of sediment control measures (if required)	4.3/B.1	**B.1 Previously disturbed area** A haybale and/or geotextile barrier should be constructed as close as practicable to the works, and should be maintained until the area is satisfactorily rehabilitated. If necessary, the area of the barrier should itself be rehabilitated after the barrier is removed.
Trench construction		
Design and construction	5.2/ A.2, A.4, A.9	**A.2 Trenches across slopes** Where a trench cuts across a slope, there is the potential to interrupt normal groundwater flow. This impact can be minimised by replacing the different layers of soil in their original position as closely as possible. This in turn requires removing the soil to segregated stockpiles when the trench is excavated (see Section 5.4). Segregation can be achieved by separating the different soil components on opposite sides of the trench **A.4 Areas with high water table** Wet areas such as wet heath, bog and short alpine herbfield should be avoided as far as practicable, but there are situations where this is not possible. In trenching through wet areas, the following practices should be applied (assuming that it is not intended to deliberately de-water the area): • Work should be undertaken as quickly as possible to prevent the surrounding area from being drained and drying out. • Because of difficulties in rehabilitating wet sites, the sod removal and replacement technique should be used if possible. • If it is necessary to pump water from the trench during the works, this should be done using a light flex-drive pump with a PVC lay-flat discharge hose to disperse the outflow. If there is silt or mud in the water, it should be discharged into a sediment trap (e.g. haybale/geotextile barrier or sediment pond), before returning to the creek further downstream. **A.9 Previously disturbed areas** In situations which have been previously disturbed and stabilised with introduced groundcover and where the natural soil structure has been disturbed, the value of maintaining the existing soil profile is reduced. Topsoil should be separated if this contains a reasonable amount of organic material or living plant matter.
Marking and recording of trenches	5.2/ B.1	**B.1 Cable detector** Where a trench contains a continuous metal cable or metal pipe, use of a cable detector is an adequate means of following the route of the trench after it is completed. Accurate records should be kept to indicate the relative layout horizontally and vertically of any services within the trench.
Protection of underground services	5.2/ C.1	**C.1 General** Underground services should be protected against accidental disturbance by laying a continuous warning tape at a higher level in the trench. This is mandatory for underground electricity cables. High voltage (11 kV) cables require one tape on top of the bedding sand about 100 mm above the cable and a second tape 100 to 150 mm below the ground surface. For cables for low voltage electricity (415V), telephone and lift communications, a single warning tape is sufficient. A warning tape is advisable also for hydraulic engineering services, including snowmaking reticulation.
Topsoil management		

Activity	Guideline	Description
Sod removal and replacement	5.3/ A.1	**A.1 General** The removal and replacement of sods should be considered only in situations where there is a reasonable opportunity for maintaining the soil and vegetation intact while the sods are out of the ground. This is applicable particularly to areas with dense groundcover (e.g. herbfield/dry grassland, wet grassland, bog, open patches within open heath or transitional heath). Soil which has a high stone content, little groundcover vegetation or deep-rooted heath is difficult to remove as intact sods. Points to be noted in the removal and replacement of sods include the following: • Removal of sods in sensitive areas (e.g. bogs) should be done by hand using a square shovel. In some other situations, it may be feasible to remove sods by excavator bucket, with careful depth control by the operator. The bucket should cut the soil just below the root level of the sod. The sod is put to one side, and the remainder of the topsoil can then be removed. • Sods will survive best if they are moist when they are removed. This may influence the timing of projects involving sod removal (e.g. early in the summer while the ground is still moist). • A sod thickness of about 200 mm is generally found to be satisfactory in the Perisher Blue environment. • Sods should be stored so that they are protected from drying out, particularly if stored for longer periods. This may involve protection with hessian and/or watering, although such measures can be avoided if they are replaced quickly. • Sods should be replaced in their original positions and orientations where possible. • The filled surface beneath the sods and the lower surfaces of the sods should be prepared to eliminate air spaces beneath the sods. Any gaps between sods should be filled with topsoil, and the sods tamped down with an excavator bucket or shovel.
Bulk topsoil removal and replacement	5.3/ B.1	**B.1 General** Topsoil should be stockpiled separately from other excavated material (see Section 5.4) in a location where it will not be disturbed by other construction works.
Stockpile management		
Handling of soil	5.4/ A.2	**A.2 Previously disturbed and rehabilitated area** An area which has been previously disturbed and rehabilitated is unlikely to display a properly developed natural profile, particularly if the disturbance took place some time ago when today's environmental practices were not widely applied. The topsoil, however, is still likely to contain plant material and some organic nutrients, and should be conserved (It may contain weeds, however). The remainder of the profile is likely to have the subsoil mixed with weathered rock, and further segregation may not be warranted.
Protection of stockpiles from erosion	5.4/ C.1	**C.1 Soil to be replaced immediately** If soil is to be replaced immediately (e.g. that day or the following day) and there is a low risk of rain, no special measures to protect stockpiles are necessary. Alternatively, if there is a likelihood of rain, small jobs should be deferred to a more suitable date if practicable.
Choice of plant species for revegetation		
General	6.1/A.1	**A.1 Previously disturbed and rehabilitated site** If the site has previously been disturbed and rehabilitated with either Chewings fescue or alpine mix, Chewings fescue, preferably containing some native seed, should be used for rehabilitation.
Rehabilitation using native/Chewings fescue	6.2/A.1	**A.1 General** The sowing of seed for rehabilitation should be undertaken as soon as possible after development works are complete and topsoil has been respread on the site. If the site has been compacted the surface should be loosened to a depth of at least 50 mm prior to spreading the

Activity	Guideline	Description
mix		topsoil, which should be spread over the loosened surface to a depth of between 50 and 100 mm. Chewings fescue and Dynamic Lifter fertiliser should be handcast over the area at the following application rates for a typical site: Dynamic lifter 1 kg per 5 sq m Seed 1 kg per 40 sq m Higher application rates are used to increase the strike rate on steeper slopes or where the aspect or soil conditions are unfavourable. Hay should be spread over the site at an application rate of about 1 bale per 15 sq m for wet hay or 1 bale per 25 sq m for dry hay. These application rates should be increased on steep slopes. The hay is then sprayed with anionic emulsion to stabilise the hay cover. The heat from the emulsion also assists in seed germination. The site should be monitored regularly during the summer with a repeat application if necessary. Following the first winter it should be inspected for damage by wind or grooming machinery.
Monitoring	6.8/A	**A. General monitoring** Monitoring of rehabilitation should be undertaken as follows: **During the summer of rehabilitation works** once per summer month or after **every** abnormal natural event (e.g. heavy rain, storm, extreme winds or severe dry period). In addition, inspections should be carried out as a matter of course if working in the area. **Following the first winter** to check on wind or groomer damage. **During the following summer** to identify areas where rehabilitation has not been satisfactory following the first spring growth period and additional work is required. **Subsequent summer periods** to identify any further problem areas requiring remedial works.

APPENDIX G NATIONAL HERITAGE CRITERION

National Heritage List Impact Assessment (EPBC Act)

Australian Alps National Parks

The Australian Alps National Parks (AANP), which includes KNP, is listed on the National Heritage List, protected under the EPBC Act. To determine if a referral to the Minister is required, the following assessment considers the impact of the proposal against the listed criteria for the National Heritage of the Australian Alps. The National Heritage criteria for a place are any or all of the following:

(a) the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history

The AANP are listed under this criterion for its glacial and periglacial features; fossils; karst areas; biological heritage; moth feasting; transhumant grazing; scientific research; water harvesting; and recreation.

The proposed works would simplify and update the existing electricity network at the base of Smiggin Holes so that all Perisher Ski Resort owned infrastructure can be operated from a single electricity supply. The proposed development for the upgrade of the electrical infrastructure would not conflict with any of the above heritage values of the AANP.

(b) the place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history

The Australian Alps is listed under this criterion for its landscape and topography; glacial and periglacial features; fossils; alpine and sub-alpine systems; and eucalypt flora communities.

The proposed development would not conflict with any of the above heritage values. The upgrade of the electrical services would only have a negligible impact on the overall landscape of this part of the AANP, and is considered a very small development in comparison to the overall ski resort area. The area to be used is also already cleared and highly modified.

(c) the place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history

Not Applicable

(d) the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of: (i) a class of Australia's natural or cultural places, or (ii) a class of Australia's natural or cultural environments

The Australian Alps are listed for the North-East Kosciuszko Landscape values.

The proposal is not located in the above area of KNP and would therefore not impact on that landscape.

(e) the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group

The Australian Alps are listed under this criterion for their powerful, spectacular and distinctive landscape that is highly valued by the community. These aesthetic characteristics include the KNP main range for its mountain vistas, panoramas, snow covered crests, slopes and valleys, alpine streams and rivers and lakes.

Due to the scale and nature of the proposal, it is not considered the works would impact on any of the heritage values under this criterion.

(f) the place has outstanding heritage value to the nation because of the place's importance in demonstrating a high degree of creative or technical achievement at a particular period

Not Applicable

(g) the place has outstanding heritage value to the nation because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons

The Alps are listed under this criterion for their special association to the community of their unique landscapes and the possibility of experiencing remoteness and as the only opportunity of broad-scale snow recreation in Australia.

The scale of the proposal at Perisher would not impact on the above values, including important items such as mountain huts, significant lodges and outstanding landscapes that are valued by the community.

(h) the place has outstanding heritage value to the nation because of the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history

The place is listed under this criterion for its association with the life or works of prominent people such as Baron Ferdinand Von Mueller, Eugen Von Guerard, writers 'Banjo' Patterson, Elyne Mitchell and David Campbell.

The proposed development would not have any impact on the life or works of people with importance to the AANP.

(i) the place has outstanding heritage value to the nation because of the place's importance as part of Indigenous tradition.

Not Applicable

Conclusion of Impact Assessment

The proposed development for the upgrade of the electrical infrastructure would not conflict with any of the above heritage values of the AANP, and therefore the risks are not considered significant. Therefore, under the EPBC Act, referral to the Minister is not required.