



Project: Resort Operations Centre
213A Kings Cross Road, Kiandra NSW
Lot 36 DP 46316

DATE: NOVEMBER 2020
PREPARED FOR: SELWYN SNOW RESORT PTY LTD
PREPARED BY: COMPLETE TOWN PLANNING PTY LTD
REVISION: REV 02

COMPLETEPLANNING.COM.AU | INFO@COMPLETEPLANNING.COM.AU
PO BOX 642 JINDABYNE NSW 2627 | PH 02 6456 7176

1.0 Introduction

The project for which this Statement applies is for a new Resort Operations Centre for Selwyn Snow Resort and associated infrastructure. The proposal aims to seek approval for the construction of a new Resort Operations Centre providing staff facilities, Ski Patrol office, groomer and ski-doo storage and vehicle repair station after the previous building suffered extensive damage in the 2019/2020 bushfires.

Selwyn Snow Resort is located at 213A Kings Cross Road, Kiandra within the Kosciuszko National Park, NSW. The site is legally described as Lot 36 DP46316.

The proposed development is deemed to be of positive influence on both the Selwyn Snow Resort and Kosciuszko National Park by offering an operations centre to aid operation and management of the resort as well as enhance the safety and guest experience of visitors to Selwyn Snow Resort. Associated infrastructure for the development includes local regrading of gravel service road, connection to services established within the Visitor Centre Development Application and installation of an On-Site Sewerage Management System (OSSM) with overflow to be connected to the wastewater treatment facility. The proposed development encourages safe operations and management to provide a well-managed recreation environment for visitors, enhancing their experience of Kosciuszko National Park.

It is proposed that construction of the Resort Operations Centre will be stage as per the below:

- Civil works, building envelope and ground floor internal fitout
- Level 1, internal fitout and access stairs
- Monocrane

This Statement of Environmental Effects will accompany a Development Application to be lodged with the Department of Planning & Environment (DPE) in accordance with the State Environmental Planning Policy (Kosciuszko National Park—Alpine Resorts) 2007, under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

FIGURE 1 PROPOSED RESORT OPERATIONS CENTRE LOCATION



2.0 Site Location & Context

2.1 Site Analysis

The Snowy Mountains is a popular tourist destination for both Australians and international travellers. The region offers an array of attractions including the Kosciuszko National Park, Snow Resorts, world class mountain biking and Australia's highest mountain, Mt Kosciuszko. The local economy is driven by the winter season with skiing and other winter sports being unique to this region of Australia. A growing summer tourism trade has been developing with activities such as hiking, fishing, kayaking, and mountain biking encouraging outdoor enthusiasts to visit the region

The resort areas, including Selwyn Snow Resort are important to New South Wales due to their economic and social contribution as well as their location within a unique alpine environment.

The site is Lot 36, located at 213A Kings Cross Road in Kiandra within the Kosciuszko National Park (See Figure 1). The site has an area of approximately 204 ha. The site accommodates a snow resort comprised of 11 lifts with 10km of ski runs.

Facility buildings which serviced Selwyn Snow Resort experienced extensive damage during the 2019/2020 bushfire season and have since been removed from site. As a result, the site is currently clear of buildings with only lifts and snow making infrastructure remaining.

The proposed location of the Resort Operations Centre is similar to the previous structure to the East off the existing path of Kings Cross Road (bypass soon to be constructed) and accessed via the service road. This location is clear of structures and vegetation and allows for substantial APZs to be maintained in perpetuity within the allotment boundary (see bushfire hazard assessment report provided).

The replacement Resort Operations Centre is proposed to be located within an existing cleared area of Selwyn Snow Resort. The proposed site location allows for adequate APZ distances to meet requirements for SFPP development with minimal vegetation clearing as well as allow forward entry and exit to the existing path of Kings Cross Road for firefighting vehicles.

In addition to this, the proposed site location of the Resort Operations Centre is within an area of disturbed vegetation removal and allows for the least removal of damaged vegetation from the 2019/2020 bushfire season. The proposed site also allows for the minimum excavation needed to provide a flat site reducing impacts to the environment. Likewise, there have been no known Aboriginal artefacts found during construction of previous structure and the proposed new Resort Operations Centre and OSSM location have both experienced extensive ground disturbance from past developments. Local regrading of the existing gravel service road will also present very-low risk of Aboriginal artefacts being impacted nor from connecting services with service trenches established within the Visitor Centre Development Application and connections to building will traverse extensively disturbed ground.

As a result the proposed Resort Operations Centre acknowledges the environmental and cultural significance of the area and has proposed a thoughtful re-development of the site and hence improves the long-term resilience of Mt Selwyn Snow Resort while maintaining the environmental values of the Kosciuszko National Park.

The proposed site demonstrates a siting pattern and orientation to fit the property boundaries, access road and landfalls. Set on a ridge, the land falls to the North of the site and to the South which has been previously cleared for use as ski runs. Snowy Hydro is proposing to construct a new 10m wide road to the West of the existing carpark to replace the existing route of Kings Cross Road through the Selwyn Snow Resort carpark. This not only allows for greater bushfire protection to occupants but will also reduce non-tourist and staff related traffic to the resort area. Electricity infrastructure will be reinstalled to the site by Essential Energy which will service the Resort Operations Centre.

Further re-development of Selwyn Snow Resort has been applied for under separate Development Applications and will provide important guest facilities and accommodation for staff to aid the safe and effective management of the resort.

FIGURE 2 PROPOSED LOCATION OF RESORT OPERATIONS CENTRE WITHIN CONTEXT OF SELWYN SNOW RESORT

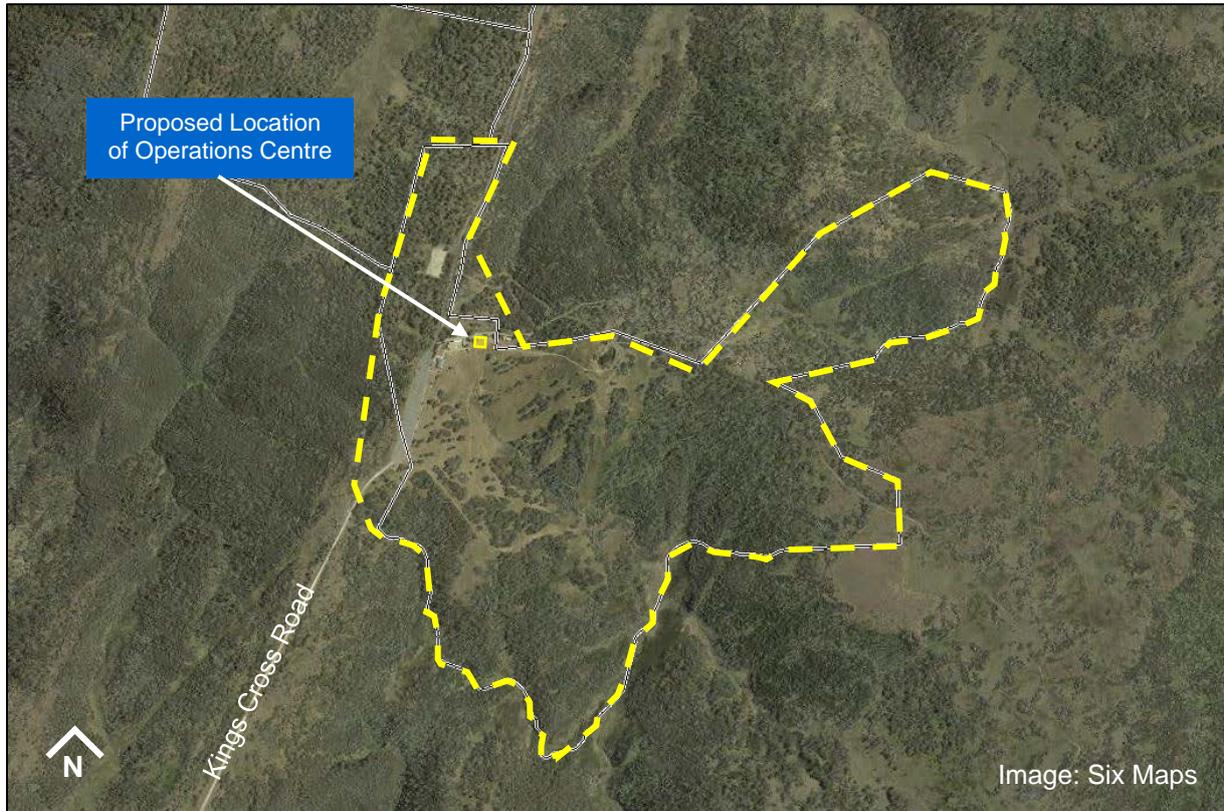
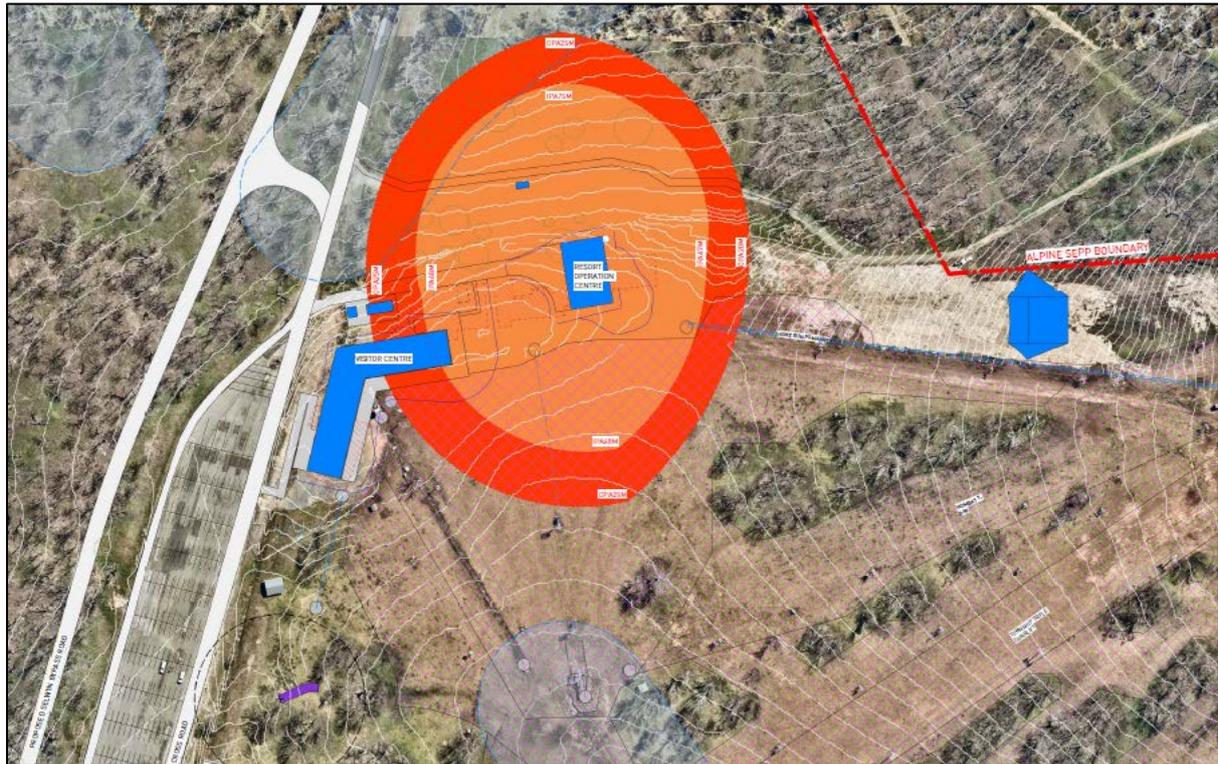


FIGURE 3 AERIAL VIEW OF SITE



FIGURE 4 PROPOSED SITE PLAN



2.2 Site Contours

Landfall is generally consistent across the site and surrounding immediate area with the proposed site set on the top of a wide ridgeline with downslope to the North, South and West and upslope to the East.

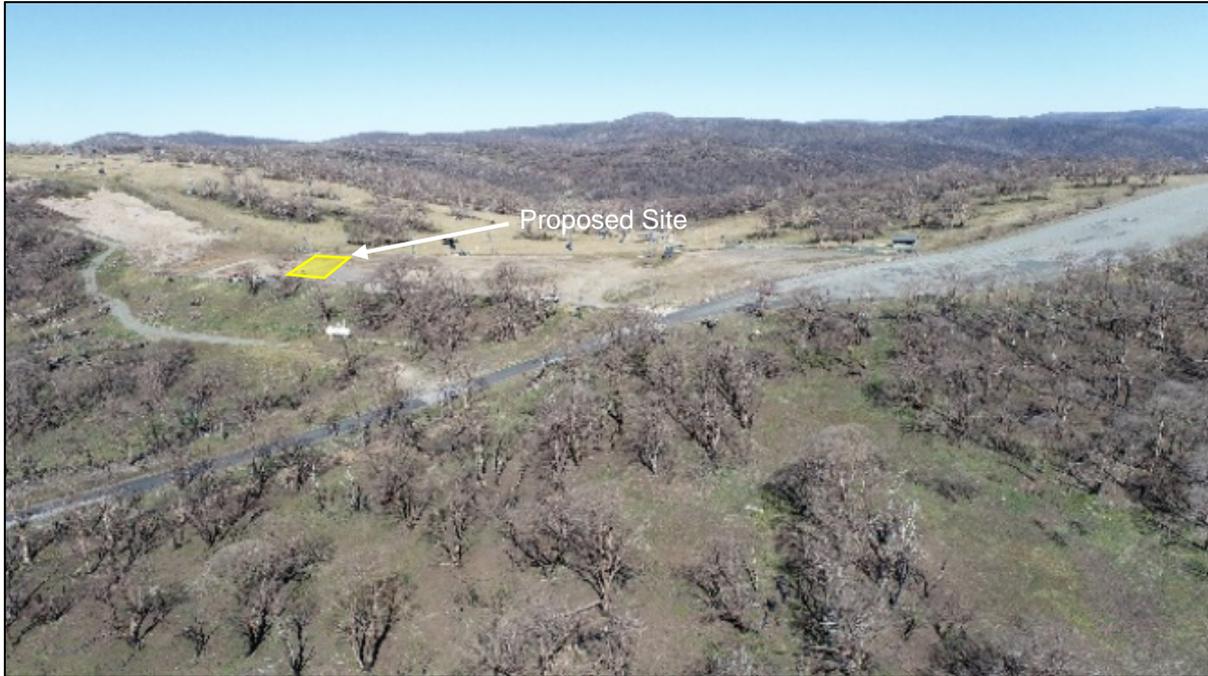
To supplement the application, a geotechnical report by ACT Geotechnical Engineering was undertaken to assess the site suitability for the resort operations centre (see geotechnical report provided). ACT Geotechnical Engineering determined that:

“Provided that the design and construction of the structures is undertaken in accordance with accepted procedures for hillside construction, and treatments and mitigation measures are carried out to reduce the potential hazards (as recommended in Section 5.6 and Section 6 of geotechnical report), the risk is assessed to be ‘Very Low’ to ‘Low’ (See Table 1b of geotechnical report). Therefore, it is assessed that the site is suitable for the proposed snow resort redevelopment (provided all the recommendations in our report are followed).”

Access to the site is well maintained.

2.3 Site Photos

Mt Selwyn Snow Resort



Mt Selwyn Snow Resort



Aerial View 1



Aerial View 2



Aerial View 3



3.0 Project

The proposal aims to gain approval to construct a new Resort Operations Centre and associated infrastructure at Selwyn Snow Resort.

The proposed development is deemed to be of positive influence to both the Mt Selwyn Snow Resort and Kosciuszko National Park by providing a base for operations to aid in the daily running and management of the resort, including providing staff facilities and ski patrol to enhance the safety of guests to Mt Selwyn Snow Resort. The proposed development encourages sound operations and provides a safe recreation environment to visitors enhancing their experience of Kosciuszko National Park.

The proposed project for this application seeks approval for the below scope of works:

- Resort Operations Centre
- Regrading of existing service road (establish carparking and turn around bay)
- Installation of On-Site Sewerage Management System (OSSM)
- Connection to services

It is proposed that construction of the Resort Operations Centre will be staged as per the below:

- Civil works, building envelope and ground floor internal fitout
- Level 1, internal fitout and access stairs
- Monocrane

The proposed Resort Operations Centre offers an articulated façade with a mix of materials and natural tones. This allows the structure to not only blend into the area but also complement the existing landscapes and development found within the Kosciuszko National Park and Snowy Mountains region. Likewise, the proposed building utilises steel construction with a natural monument tone that will not only blend into the natural environment but also complement the new built environment of the new Staff Accommodation dwellings and Visitors Centre.

The proposed Resort Operations Centre will provide staff amenities which will be occupied by up to 20 staff members at any one time during the winter season. During the summer months, maintenance and core operational staff will comprise of up to 5 staff members. The Resort Operations Centre will provide storage of important operational vehicles such as snow groomers, tractor and ski-doo's.

In addition to the Resort Operations Centre, essential infrastructure will also be established including local regrading of service road, installation of OSSM and connection to services established in previous development applications.

Water will be supplied to the Resort Operations Centre from the 280,000L potable water tank. Water to the tank is provided by the existing pump house at Clear Creek (WAL Number: 33430 – 2ML for domestic use and WAL: 33428 – 40 units). No new connections to Clear Creek are proposed as part of this application. Once treated, water from the water storage tank will be reticulated to the Resort Operations Centre via the services trench included in the Visitor Centre Development Application. A separate water supply from the enlarged quarry dam will provide a 576,000L dedicated firefighting water supply to both the Resort Operations Centre and Visitor Centre via hydrant system applied for with the Visitor Centre Development Application. No new services trenches are proposed to connect the building to the water sources.

Stormwater is proposed to be drained to the north as per the drainage arrangements of the previous development with a peak discharge of 48l/s. A stormwater assessment by TTW found:

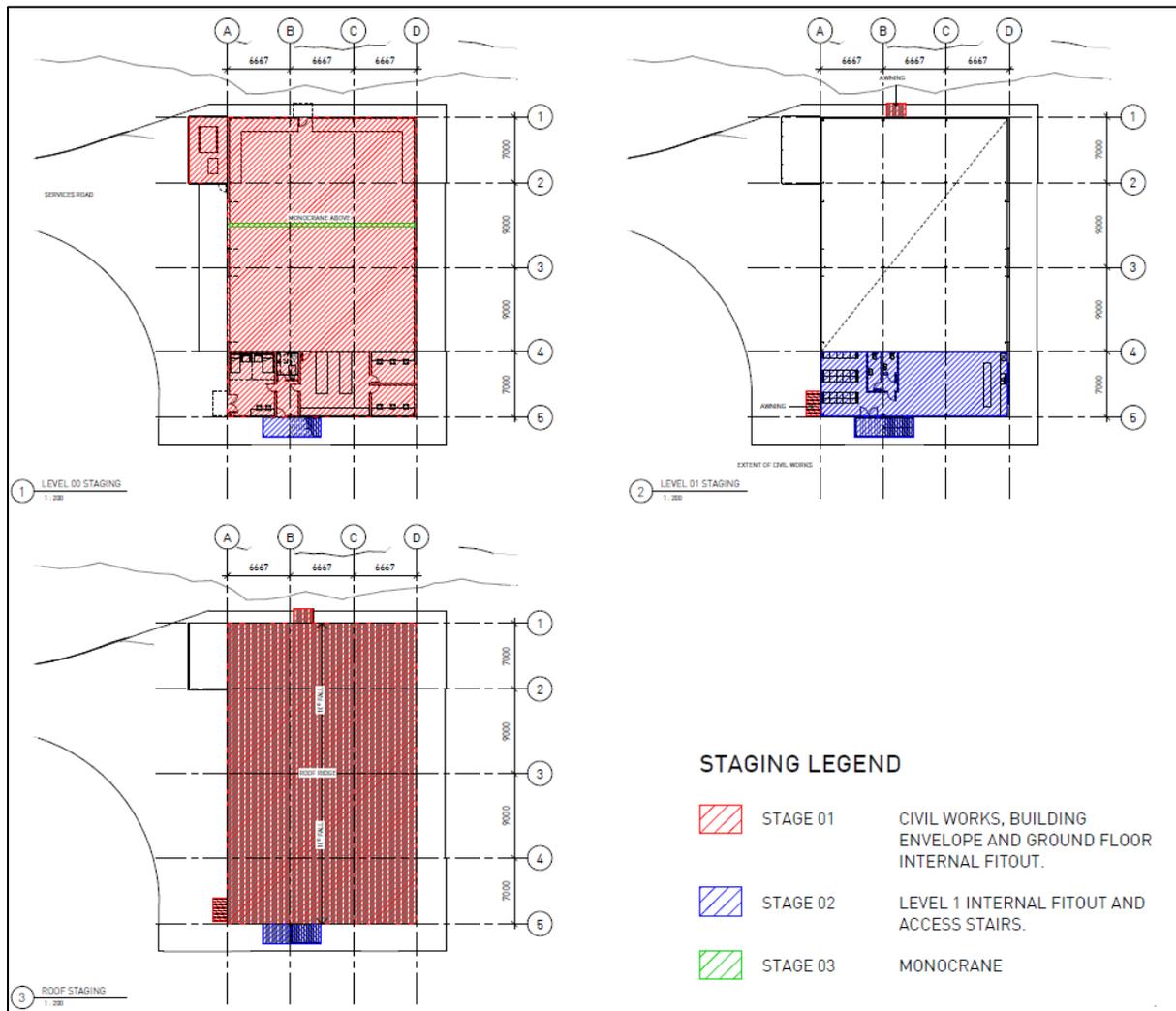
“Due to all the works area being previously developed and containing impervious areas, the peak stormwater discharge from the developed site did not increase over the existing conditions. As such a detention strategy is not required.” (Appendix III).

Access to the Resort Operations Centre is from the existing vehicle crossover and service road provided from Kings Cross Road. It is proposed that the existing gravel service road will be maintained by local regrading within 15 metres of the Resort Operations Centre to provide connections to the proposed building. The service road meets the requirements of *Planning for Bushfire Protection 2019* and will permit forward entry and exit movements for emergency vehicles. The service road is not intended for public access and shall be signposted accordingly.

Carparking of essential resort operation vehicles is proposed adjacent to the Resort Operations Centre and shall be managed operationally with staff. Proposed carparking will also be signposted accordingly to ensure not utilised by members of the public.

Wastewater is proposed to be collected and treated via an aerated on-site septic system. The proposed septic system will provide wastewater collection for up to 10 occupants and to be used in the summer months where up to 5 maintenance and operational staff could be present at any one time. It is proposed to be connected to the wastewater treatment facility. Wastewater measures provided for ten occupants will satisfy requirements for summer operations and the connection to the wastewater treatment facility will provide adequate wastewater services when occupants will increase during the winter season. Previous soil testing of the site found no major limitations to installing an on-site wastewater management and the proposed system to be installed will be the same as proposed for the Staff Accommodation as per civil engineering plans and report provided.

FIGURE 5 STAGING PLAN

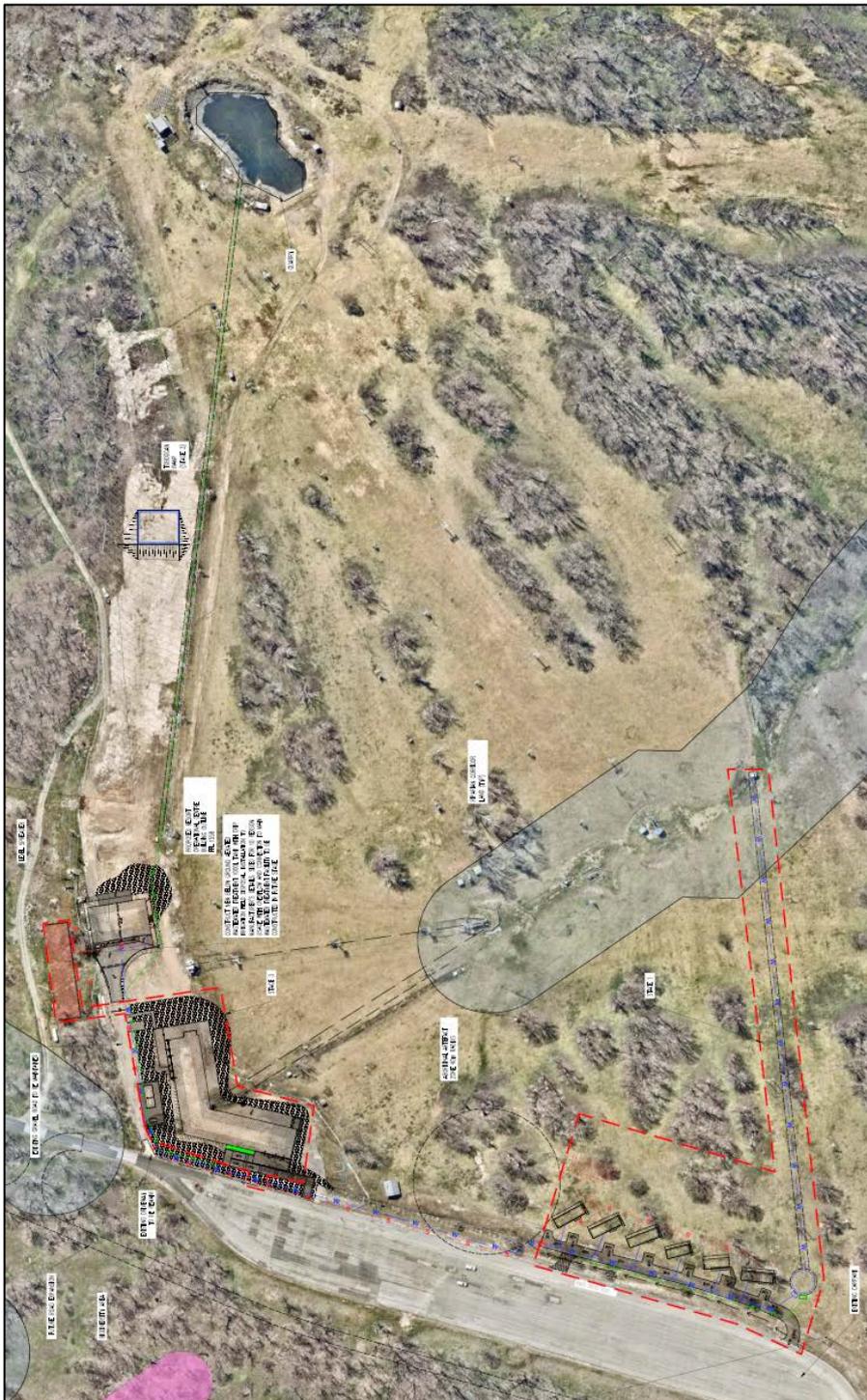


As part of the re-development of Selwyn Snow Resort, and the Resort Operations Centre the site will be designed to hold: 4,500L of diesel and 500L of petrol, with the aggregate capacity of Class 3 PG II

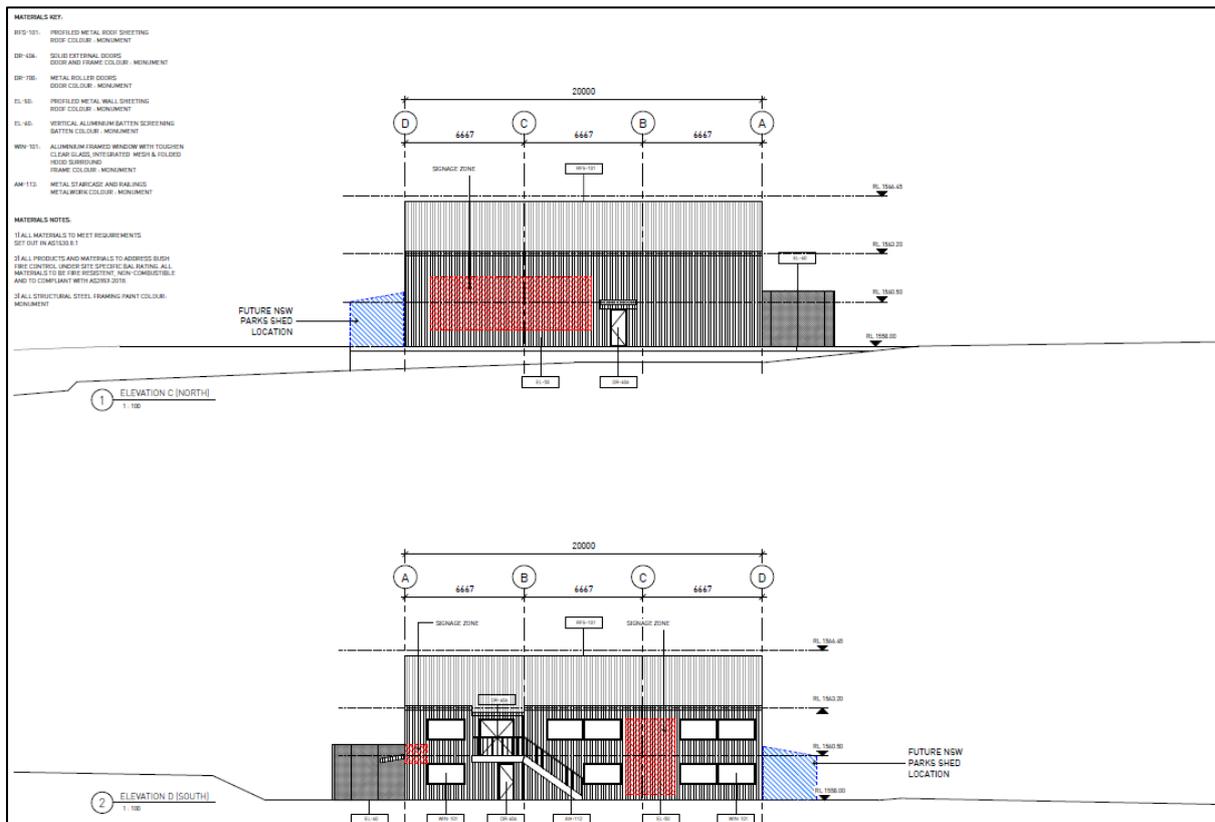
in this storage area. The fuel will be located externally in aboveground storage tanks. In addition to this, minor quantities of oils and lubricants will be stored inside the Resort Operations Centre and will be used as part of the maintenance of equipment. A design guidance document for the fuel storage has been provided by Kleinfelder which outlines the recommendations for the development. Fuel filling areas will be bunded and fuel spills will be dealt through operational procedures such as spill kits as noted in the HAZMAT report.

Essential Energy is in the process for reinstalling electrical infrastructure after extensive damage occurred during the 2019/2020 bushfires. The new electrical infrastructure will service the proposed Resort Operations Centre.

FIGURE 6 GENERAL ARRANGEMENT PLAN



3.1 Resort Operations Centre Design



4.0 Table 1—General Information

Project description

The proposal aims to gain approval to construct a new Resort Operations Centre and associated infrastructure at Selwyn Snow Resort. The proposed scope of works includes:

- Resort Operations Centre
- Regrading of existing service road (establish carparking and turn around bay)
- Installation of On-Site Sewerage Management System (OSSM)
- Connection to services

It is proposed that construction of the Resort Operations Centre will be stage as per the below:

- Civil works, building envelope and ground floor internal fit-out
- Level 1, internal fit-out and access stairs
- Monocrane

FIGURE 7 PROPOSED RESORT OPERATIONS CENTRE



Site suitability

The site is suitable for the proposed development.

- site constraints such as flooding, slope, geotechnical hazards, bushfire and any other risks

Selwyn Snow Resort is identified as bushfire prone land. See bushfire hazard assessment provided by Complete Town Planning. The site is within “Zone G” of the Kosciusko National Parks Alpine Resorts, and hence a geotechnical investigation and slope instability risk assessment is required. See

	geotechnical report and Form 1 provided by ACT Geotechnical Engineers.
<ul style="list-style-type: none"> effects on the local environment, landscape, streetscape, appearance or scenic quality of the locality 	<p>The proposed Resort Operations Centre offers a monument façade which will complement the proposed built environment of the re-development of Selwyn Snow Resort, consistent with designs of the Visitor Centre and Staff Accommodation dwellings (applied for separately). The thoughtful design will blend seamlessly into the natural environment of Kosciuszko National Park and complement the landscape offering natural, non-reflective tones.</p> <p>When viewed from Kings Cross Road, the bulk and mass of the Resort Operations Centre will not be apparent with the thoughtful position of the building approximately 125 metres from the existing crossover as seen below in the 3D render. The proposed building will not be visible from the new proposed Kings Cross Road bypass of Selwyn Snow Resort which forms part of the Snowy Hydro 2.0 project.</p>  <p>Stylised signage is proposed to clearly identify the Resort Operations Centre building with locations of signage shown on the elevation plans provided. The Resort Operations Centre is accessible from the service road which will be regraded and provide carparking and turn around bay for emergency service vehicles.</p> <p>The proposed building will not create any overshadowing on the Visitor Centre, Staff Accommodation or any recreation areas of the resort as shown in the shadow analysis plans provide by Sissons Architects.</p>

FIGURE 8 MATERIALS SCHEDULE

MATERIALS KEY:		MATERIALS NOTES:	
RFS-101:	PROFILED METAL ROOF SHEETING ROOF COLOUR : MONUMENT	1) ALL MATERIALS TO MEET REQUIREMENTS SET OUT IN AS1530.8.1	
DR-406:	SOLID EXTERNAL DOORS DOOR AND FRAME COLOUR : MONUMENT	2) ALL PRODUCTS AND MATERIALS TO ADDRESS BUSH FIRE CONTROL UNDER SITE SPECIFIC BAL RATING. ALL MATERIALS TO BE FIRE RESISTANT, NON-COMBUSTIBLE AND TO COMPLIANT WITH AS3959:2018.	
DR-700:	METAL ROLLER DOORS DOOR COLOUR : MONUMENT	3) ALL STRUCTURAL STEEL FRAMING PAINT COLOUR: MONUMENT	
EL-50:	PROFILED METAL WALL SHEETING ROOF COLOUR : MONUMENT		
EL-60:	VERTICAL ALUMINIUM BATTEN SCREENING BATTEN COLOUR : MONUMENT		
WIN-101:	ALUMINIUM FRAMED WINDOW WITH TOUGHEN CLEAR GLASS, INTEGRATED MESH & FOLDED HOOD SURROUND FRAME COLOUR : MONUMENT		
AM-112:	METAL STAIRCASE AND RAILINGS METALWORK COLOUR : MONUMENT		
<ul style="list-style-type: none"> biological and ecological impacts including the impacts on fauna and flora 		<p>Proposed site locations of the Resort Operations Centre and OSSM are not identified as areas with high biodiversity values. See Biodiversity and Aboriginal Heritage Assessment provided by Complete Town Planning.</p> <p>All vegetation removal is to be undertaken under guidance and consultation with NPWS.</p> <p>A rehabilitation plan is to be established in consultation with NPWS prior to construction to address the minimal vegetation removal required for establishment of APZ and impacts of the 2019/2020 bushfires.</p> <p>Low impact on fauna and flora from the proposed works as no vegetation is required to be removed. See fauna and flora assessment provided by ecologist, David Woods.</p>	
<ul style="list-style-type: none"> impacts on existing and future amenity of the locality 		<p>The upgrades are deemed to be of positive influence on both Mt Selwyn Snow Resort and Kosciuszko National Park by providing operational facilities to allow continued operations of the alpine resort after losing previous amenities and infrastructure in 2019/2020 bushfires.</p> <p>The new operations centre will provide modern facilities for resort staff and ski patrol. Local regrading of the existing service road will improve access and allow for carparking for essential</p>	

	<p>vehicles as well as turn around bay for emergency vehicles.</p> <p>The proposed Resort Operations Centre will service the resort and encourage use of the recreational area protecting the cultural significance of the resort while promoting the values of the National Park.</p>
<ul style="list-style-type: none"> the age and condition of any structures or buildings. 	<p>The proposed Resort Operations Centre is part of a larger re-development of the resort which encountered major damage in the 2019/2020 summer bushfire season.</p>

Present and previous uses

Selwyn Snow Resort is one of New South Wales four ski resorts within the Kosciuszko National Park. The proposed Resort Operations Centre will allow for safe operation and management of the resort area and is needed prior to the alpine resort being able to re-open.

Facility buildings which serviced Selwyn Snow Resort experienced extensive damage during the 2019/2020 bushfire season and have since been removed from site. As a result, the site is currently clear of buildings with only lifts and snow making infrastructure remaining.

FIGURE 9 PREVIOUS BUILDING LOCATIONS



The new proposed Resort Operations Centre is to be located in a similar location to the previous building which allows for a level site with no existing vegetation. The proposed site also allows for minimum excavation as a flat site is already provided, reducing impacts to the environment.

Likewise, the proposed Resort Operations Centre and On-Site Sewerage Management System is not located near any known or declared Aboriginal artefacts or sites and the ground has been previously extensively disturbed from the previous workshop/maintenance shed and associated infrastructure.

Previous underground petrol storage tanks were removed from the site and validation reports have been provided to NPWS. There is no knowledge of site contamination, and the validation reports indicate the risk of contamination from the previous underground tanks is low. Hence, no testing is not required as part of this application.

Operational details

Selwyn Snow Resort is currently closed due to the facility buildings which serviced Mt Selwyn Snow Resort experiencing extensive damage during the 2019/2020 bushfire season and having been since removed from site.

The proposed development of the Resort Operations Centre is an essential step towards the re-opening of Selwyn Snow Resort. The Resort Operations Centre will provide staff amenities, ski patrol, vehicle storage and repair station. Selwyn Snow Resort employs up to 90 staff members (shift workers) throughout the winter season and the Resort Operations Centre will provide staff amenities which be occupied by up to a maximum of 20 staff members at any one time during the winter season.

Summer operations at Mt Selwyn Snow Resort are for essential management and maintenance staff (maximum 5 staff members) who perform all necessary duties to ensure safe operation during the winter ski season.

Change of use of a building (where there is no building work)

Not applicable.

Building classification and Building Code of Australia (BCA)

The Resort Operations Centre is classed 7b and 5.

Fire safety measures are to comply with NCC/BCA, see electrical plan provided.

No performance solutions are proposed.

Snow Deposition

The roof structure and pitch has been designed to reduce snow build up. Main entries and exits have been designed adequately to reduce the likely hood of snow falling onto these areas being covered by an awning. Cook and Roe structural engineers determined a ground snow load of 7.8kPa and the resort operations centre has been designed in accordance with these calculations and AS1170.3.

There are no anticipated issues regarding snow push material and sediment will be captured by this area and be stopped by downstream snow conditions. It is proposed this material will be pushed to the landscape area to the North of the resort operations centre. Civil engineers, TTW do not anticipate any operational issues with snow clearing of the gravel access road as the proposed road will be compacted and provide a smooth surface. Likewise, snow loading and build-up will not affect the proposed civil and hydraulics works and if required, fire pumps shall be protected from snow loads and build-up by a low height enclosed structural screen designed to AS1170.1 live and dead loads.

Geotechnical Engineering Summary

To supplement the application, a geotechnical report by ACT Geotechnical Engineering was undertaken to assess the site suitability for the Resort Operations Centre (see geotechnical report provided).

ACT Geotechnical Engineering determined that

“The upper (low plasticity) soil is moderately reactive in terms of potential shrink-swell movements that may occur due to seasonal ground moisture changes. The characteristic ground surface movement “ys”, as defined by AS2870 for the range of extreme dry to extreme wet ground moisture conditions is estimated to be less than 20mm. The site is therefore a Class “S” (slightly reactive).”

“In the present conditions, the overall risk to property and people is assessed to be “Very Low” to “Medium” (See Table 1a). Provided that the design and construction of the structures is undertaken

in accordance with accepted procedures for hillside construction, and treatments and mitigation measures are carried out to reduce the potential hazards (as recommended in Section 5.6 and Section 6 of geotechnical report), the risk is assessed to be 'Very Low' to 'Low' (See Table 1b of geotechnical report). Therefore, it is assessed that the site is suitable for the proposed snow resort redevelopment (provided all the recommendations in our report are followed)."

See geotechnical reports and form 1 (Appendix II)

Civil Engineering Summary

Water Supply

Water will be supplied to the Resort Operations Centre from the 280,000L potable water tank. Water to the tank is provided by the existing pump house at Clear Creek (WAL Number: 33430 – 2ML for domestic use and WAL: 33428 – 40 units). No new connections to Clear Creek are proposed as part of this application. Once treated, water from the water storage tank will be reticulated to the Resort Operations Centre via the services trench included in the Visitor Centre Development Application.

A separate water supply from the enlarged quarry dam will provide a 576,000L dedicated firefighting water supply to both the Resort Operations Centre and Visitor Centre via hydrant system applied for with the Visitor Centre Development Application. No new services trenches are proposed to connect the building to the water sources.

Stormwater

Stormwater is proposed to be drained to the north as per the drainage arrangements of the previous development with a peak discharge of 48l/s. A stormwater assessment by TTW found:

"Due to all the works area being previously developed and containing impervious areas, the peak stormwater discharge from the developed site did not increase over the existing conditions. As such a detention strategy is not required." (Appendix III).

Access Road

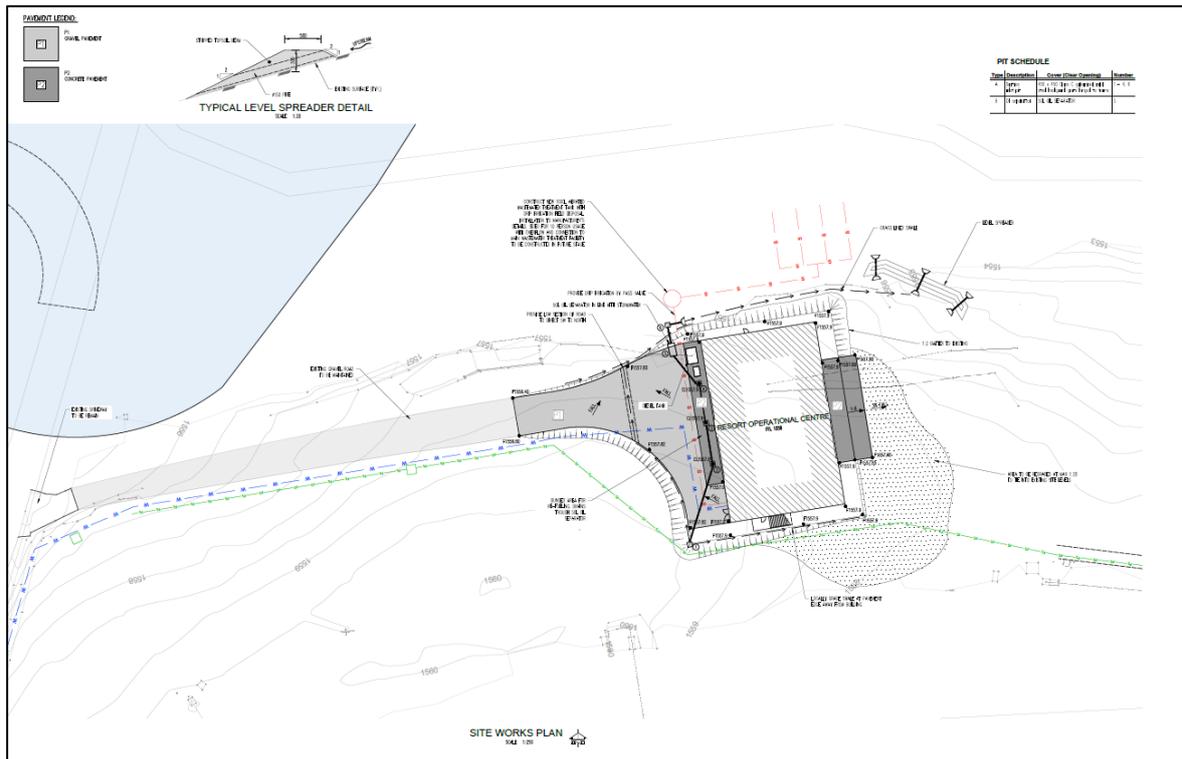
Access to the Resort Operations Centre is from the existing vehicle crossover and service road provided from Kings Cross Road. It is proposed that the existing gravel service road will be maintained by local regrading within 15 metres of the Resort Operations Centre to provide connections to the proposed building. The service road meets the requirements of *Planning for Bushfire Protection 2019* and will permit forward entry and exit movements for emergency vehicles. The service road is not intended for public access and shall be signposted accordingly.

Carparking of essential resort operation vehicles is proposed adjacent to the Resort Operations Centre and shall be managed operationally with staff. Proposed carparking will also be signposted accordingly to ensure not utilised by members of the public.

Wastewater

Wastewater is proposed to be collected and treated via an aerated on-site septic system. The proposed septic system will provide wastewater collection for up to 10 occupants and to be used in the summer months where up to 5 maintenance and operational staff could be present at any one time. It is proposed to be connected to the wastewater treatment facility. Wastewater measures provided for ten occupants will satisfy requirements for summer operations and the connection to the wastewater treatment facility will provide adequate wastewater services when occupants will increase during the winter season. Previous soil testing of the site found no major limitations to installing an on-site wastewater management and the proposed system to be installed will be the same as proposed for the Staff Accommodation as per civil engineering plans and report provided.

FIGURE 10 CIVIL ENGINEERING SITE WORKS PLAN



Structural Engineering Details

Cook and Roe structural engineers determined a ground snow load of 7.8kPa and the Resort Operations Centre has been designed in accordance with these calculations and AS1170.3.

See structural engineering plans and structural design certification provided.

Social and economic impact

The proposed Resort Operations Centre is part of a larger re-development of Selwyn Snow Resort after the devastating impacts of the 2019/2020 bushfire season. Providing much needed amenities for staff and operation management (with a DA for Visitors Centre, Staff Accommodation and essential infrastructure applied for separately) will aid Selwyn Snow Resort to reopen after being forced to close after the loss of needed amenities. As a result, the proposed development will strengthen the long-term resilience of the region.

The proposed Resort Operations Centre has been designed to enhance amenity of Selwyn Snow Resort and the Kosciuszko National Park. The proposed project is not expected to generate any negative social or economic issues. Instead, the new Resort Operations Centre will provide greater amenity to the resort offering a base for operations and management of the resort with maintenance work undertaken during the summer months and ski resort operations during the winter season.

The investment in the building will result in positive economic impacts with a number of short-term construction jobs being generated. Additionally, on a long-term basis the proposed resort operations centre will provide staff amenities, ski patrol and operations base, with the resort hiring up to 90 staff (shift workers) during the winter season.

The re-development of Selwyn Snow Resort will promote tourism in the area and re-strengthen the long-term resilience of the area by providing jobs and boosting the tourism economy (along with separate development applications for construction of Visitor Centre, Staff Accommodation and other infrastructure).

Access and traffic

Access to the Resort Operations Centre is from the existing gravel service road accessed from Kings Cross Road. As part of the Snowy 2.0 project, the existing path of Kings Cross Road is proposed to be replaced by a new bypass of the resort.

The bypass of Selwyn Snow Resort is currently under final design process by Snowy Hydro which will provide Selwyn Snow Resort with a separate through access road which will reduce the traffic and allow a safer environment for resort users.

Access to the Resort Operations Centre is from the existing vehicle crossover and service road provided from Kings Cross Road. It is proposed that the existing gravel service road will be maintained by local regrading within 15 metres of the Resort Operations Centre to provide connections to the proposed building. The service road meets the requirements of *Planning for Bushfire Protection 2019* and will permit forward entry and exit movements for emergency vehicles. The service road is not intended for public access and shall be signposted accordingly.

Carparking of essential resort operation vehicles is proposed adjacent to the Resort Operations Centre and shall be managed operationally with staff. Proposed carparking will also be signposted accordingly to ensure not utilised by members of the public.

In addition to this, core staff staying in Staff Accommodation are provided with two carparking spaces per cabin (separate DA application). Additional carparking is available in Selwyn Snow Resort day and overnight carparking areas.

No major increases in traffic will occur due to the proposed development as the operations centre is not a traffic generating structure.

Privacy, views and overshadowing

There will be no privacy, views or overshadowing issues created by the proposed operations centre with no residential accommodation nearby. The thoughtful design will allow the building to complement the natural environment and re-development of the resort and will create variety and visual interest to the resort.

The proposed building will not create any overshadowing on the Visitor Centre, Staff Accommodation or any recreation areas of the resort as shown in the shadow analysis plans provided by Sissons Architects.

Air and noise

No air and noise pollution will be created by the proposed resort operations centre.

As noise is not a major issue, a report from qualified acoustic consultant will not be required.

Soil, water and wastewater management

Water

Water will be supplied to the Resort Operations Centre from the 280,000L potable water tank. Water to the tank is provided by the existing pump house at Clear Creek (WAL Number: 33430 – 2ML for domestic use and WAL: 33428 – 40 units). No new connections to Clear Creek are proposed as part of this application. Once treated, water from the water storage tank will be reticulated to the Resort Operations Centre via the services trench included in the Visitor Centre Development Application.

A separate water supply from the enlarged quarry dam will provide a 576,000L dedicated firefighting water supply to both the Resort Operations Centre and Visitor Centre via hydrant system applied for with the Visitor Centre Development Application. No new services trenches are proposed to connect the building to the water sources.

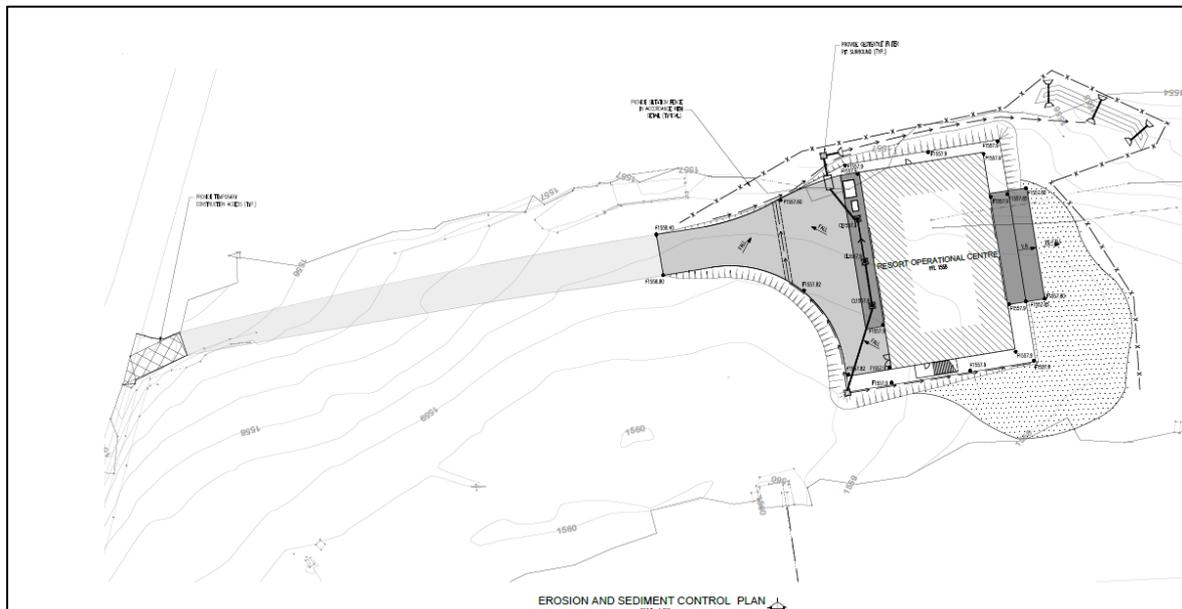
Wastewater

Wastewater is proposed to be collected and treated via an aerated on-site septic system. The proposed septic system will provide wastewater collection for up to 10 occupants and to be used in the summer months where up to 5 maintenance and operational staff could be present at any one time. It is proposed to be connected to the wastewater treatment facility. Wastewater measures provided for ten occupants will satisfy requirements for summer operations and the connection to the wastewater treatment facility will provide adequate wastewater services when occupants will increase during the winter season. Previous soil testing of the site found no major limitations to installing an on-site wastewater management and the proposed system to be installed will be the same as proposed for the Staff Accommodation as per civil engineering plans and report provided.

Soil

Refer to Site Environment Management Plan provided within this report. There will be minimal soil disturbance for the construction of the Resort Operations Centre and OSSM. This area is already classified as disturbed land and the potential of Aboriginal artefacts is very low.

FIGURE 11 EROSION AND SEDIMENT CONTROL PLAN



Heritage Summary

Gold was discovered in Kiandra in 1859, marking the start of a goldrush in the Australian Alps. At its peak, the Kiandra Goldfield supported approximately 10,000 people and demonstrates National cultural heritage significance values in relation to the conditions under which mining was undertaken up until its end in 1861. In general, mining efforts were concentrated within Kiandra and along waterways such as Four Mile Creek, Nine Mile Creek and the Eucumbene River.

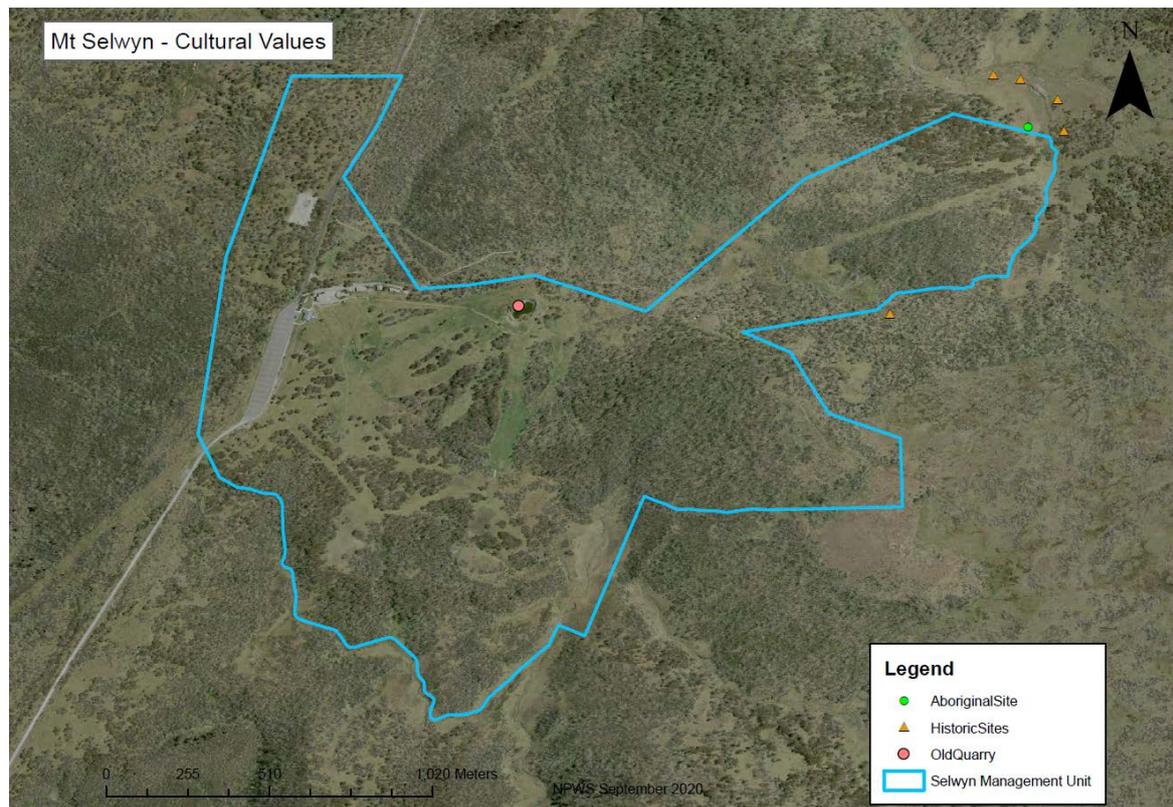
There is no documentation of any historic gold mining sites within Selwyn Snow Resort and no evidence has been found by locals or staff of the alpine resort since commencement of operations in 1966 with the installation of a tow-rope in the quarry. This is consistent with a visual inspection of the site not uncovering any old mine sites, water races or sluicing scars.

During the goldrush, northern European miners introduced skiing into the surrounding mountains. Australia's first T-bar and Ski Club, *Kiandra Pioneer Ski Club* was established in Kiandra. Skiing facilities were closed in Kiandra in 1978 and the existing lifts were moved to Selwyn Snow Resort where they continued to operate for 31 years prior to upgrades being installed. And hence, the ski resort is steeped in history and has strong cultural significance within the alpine resorts of the

Kosciuszko National Park. The proposed development will promote the use of the resort and continue the history of use as a ski field.

The below map provided by National Parks and Wildlife Service shows the known Aboriginal and historic sites as well as the old quarry located with the resort, now known as the quarry dam. The old quarry was mined for granite road base and was used as the first ski run when there was no snow left in Kiandra. The proposed battered wall at the quarry to increase the water holding capacity of the dam is to improve the bushfire fighting capabilities of the resort will not negatively impact the historic significance of the old quarry.

FIGURE 12 NPWS CULTURAL VALUES MAP



Aboriginal Cultural Heritage Summary

There are no confirmed site records or any other associated landscape feature information from an AHIMS search. There is no oral, historical or archaeological evidence to suggest that burials or places of spiritual, ceremonial or social significance occurred with the resort area.

Likewise, previous consultation with the members of the Wagonga LALC, including the conduction of a heritage survey of the lease area, resulted in the LALC considering Mt Selwyn Snow Resort to present a low potential for containing sites due to the lack of potable water and the LALC interpret the area as a place where Aboriginal people would pass through and not reside (Feary, 2010).

However, archaeologist Alistair Grinbergs (ENFAC, 2009) performed an extensive survey of Mt Selwyn Snow Resort including survey transects of the proposed development location. A single flake made from tuff was found from outside of the proposed development area. This is consistent with the history of the Australian Alps with the most likely artefacts to be found being small stone artefacts. This is as a result of stone artefacts are known to survive extensive ground disturbance, including the level of ground disturbance which has occurred within Mt Selwyn Snow Resort. It is important to note that stone artefacts are rarely found *in situ*, limiting their scientific significance (Feary, 2010)

A visual inspection of the Resort Operations Centre and OSSM sites confirmed that the proposed site does not contain any visible Aboriginal objects and the potential for subsurface cultural material is low – very-low.

As a result, the General Due Diligence Assessment showed that AHIP application is not necessary. The proposed works should be able proceed with caution and if any objects are to be found works will be stopped and appropriate authorities will be notified.

Any potential future clearing of vegetation with the APZ area should leave the tree stumps to minimise ground disturbance within these areas.

See Biodiversity & Aboriginal Heritage Assessment provided by Complete Town Planning for further information.

Vegetation Removal

No clearing is required to establish a clear building site or to create the proposed IPA and OPA due to the devastating impacts of the 2019/2020 bushfire season. These areas are to be maintained in perpetuity as per the bushfire hazard assessment report provided. Any future clearing to maintain the APZ area is to be done so in consultation with NPWS.

Where possible, tree removal will leave stumps as close to ground level as possible to avoid any further ground disturbance.

See flora and fauna assessment by ecologist, David Woods, for further information of the ecology of the proposed site and APZ areas, Appendix I.

Energy

See Section J compliance statement provided by John Raineri & Associates that certifies that the electrical, fire, heating and ventilation of the Resort Operations Centre comply with the relevant clauses for Section J compliance under the NCC/BCA 2019.

Waste

No changes proposed to existing waste minimization procedures. The Resort Operations Centre will utilize the existing waste management site accessible from the service road.

FIGURE 13 EXISTING WASTE MANAGEMENT SITE TO BE RE-ESTABLISHED



Demolition

No demolition works are required for the installation of the new building.

Termite Protection

Steel and concrete construction proposed for the project.

Refueling Station

As part of the re-development of Selwyn Snow Resort, and the Resort Operations Centre the site will be designed to hold: 4,500L of diesel and 500L of petrol, with the aggregate capacity of Class 3 PG II in this storage area. The fuel will be located externally in aboveground storage tanks. In addition to this, minor quantities of oils and lubricants will be stored inside the ROC and will be used as part of the maintenance of equipment. Fuel filling areas will be bunded and fuel spills will be dealt with via operational procedures such as spill kits as noted in the HAZMAT report.

A design guidance document for the fuel storage has been provided by Kleinfelder who provided the following key design considerations:

“The following provides a summary of the key design considerations:

- The above ground tanks will be installed with integral secondary containment as a double-walled tank. Primary and secondary containment shall be wholly constructed of steel and shall be designed in accordance with AS 1692 or an equivalent recognised Standard.*
- The petrol and diesel tanks shall be kept at least 1m away from the ROC wall.*
- Spacing between adjacent tanks shall be at least 600mm.*
- The tank shall be fitted with a means of determining the level of its contents. Such means shall be available to the delivery operator.*
- Care should be taken when decanting or transferring flammable liquids. Dispensing pumps or self-closing metal taps should be used, in order to reduce the hazards of splash filling, spillage and vapour escape.*
- The storage area should be fenced to prevent unauthorised access the fencing should be located 1m from the tanks.*
- The ground around the fenced area shall be kept clear of combustible vegetation or refuse for a distance of at least 3m.*
- At least one portable fire extinguisher, having a suitable rating for use with the range of materials being kept (such as a 4.5-9kg ABE dry chemical) shall be readily accessible and adjacent to the minor storage area. Where liquids are stored on open land, a fire extinguisher shall be provided if the liquids are decanted or transferred within 5m of the storage.*
- Every endeavour shall be made to prevent leaks or spills, and to control them if they do occur. Clean-up action shall be initiated immediately.”*

5.0 Permissibility, Legislation and Regional Plan

5.1 South East and Tableland Regional Plan 2036

The proposed Resort Operations Centre for Selwyn Snow Resort will be part of a larger re-development of Selwyn Snow Resort after the devastating impacts of the 2019/2020 bushfire season (Visitor Centre and Staff Accommodation applied for separately). Providing much needed amenities for staff and resort operations, will aid Selwyn Snow Resort to reopen after losing amenities buildings to bushfire. As a result, the proposed development is consistent with the purpose of the Regional Plan which provides a framework to provide infrastructure and development to strengthen the long-term resilience of the South East and Tableland region.

The re-development of Selwyn Snow Resort will promote tourism in the area and re-strengthen the long-term resilience of the area. For the alpine resorts, including Selwyn Snow Resort, the Regional Plan not only seeks to promote tourism and long-term resilience but acknowledges the unique environmental and cultural significance of the Kosciuszko National Park which this application has taken into consideration.

During the goldrush in the 1850s, northern European miners introduced skiing into the surrounding mountains. Australia's first T-bar and Ski Club, *Kiandra Pioneer Ski Club* was established in Kiandra. Skiing facilities were closed in Kiandra in 1978 and the existing lifts were moved to Selwyn Snow Resort where they continued to operate for 31 years prior to upgrades being installed. And hence, the ski resort is steeped in history and has strong cultural significance within the alpine resorts of the Kosciuszko National Park. The proposed development will promote the use of the resort and continue the history of use as a ski field.

In addition to this, the proposed site location of the Resort Operations Centre is within area of previous operations centre which has since been removed from site. This allows for a flat site which has undergone previous extensive ground disturbance and no vegetation removal is required.

As a result the proposed Resort Operations Centre is consistent with the Regional Plan as it acknowledges the environmental and cultural significance of the area and has considered the development to have the least impact possible while promoting the area for tourism and improve the long-term resilience of Selwyn Snow Resort.

5.2 State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007

The proposal is for a Resort Operations Centre that will allow efficient and effective management of Selwyn Snow Resort is permissible under clause 11 of the Alpine SEPP. As seen below 'commercial premises', 'transport facility' and 'vehicle repair station' are permissible with consent within Mount Selwyn Snow Resort.

Staff Facilities & Ski Patrol:

commercial premises means premises used as an office or for other business or commercial purposes (providing services to visitors and to the alpine resort in which it is located).

Groomer & Ski-Doo Storage and Repair:

transport facility means a building or place used for the transportation of passengers or goods, including a bus station, a railway terminal and a building used for the garaging of vehicles relating to the servicing of an alpine resort, such as skidoos and snow groomers, other than a building used for the servicing or repair of vehicles.

vehicle repair station means a building or place used for the purpose of carrying out repairs and fitting of accessories to vehicles.

Mount Selwyn Snow Resort – Land Use Table

Permitted without consent

Nil

Permitted with consent

Advertisements; Building identification signs; Business identification signs; Car parking; Commercial premises (other than brothels, conference facilities, entertainment facilities, health profession consulting rooms, recreation facilities, tourist accommodation and workshops); Community facilities; Educational establishments; Emergency services facilities; Fences; Food outlets; Helipads; Infrastructure facilities; Lifting facilities; Management trails; Medical centres; Public utility undertakings; Recreation infrastructure; Shops; Ski slope huts; Ski slopes; Snow-making infrastructure; Staff accommodation; Stream flow monitoring stations; Telecommunications facilities; Transport facilities; Vehicle repair stations; Weather stations

Prohibited

Any development not otherwise specified in item 1 or 2

The proposed location of the Resort Operations Centre and OSSM are within areas of extensively disturbed ground and vegetation. Hence, the proposed development will have minimal impact to the natural environment. Likewise, the 2019/2020 bushfires resulted in extensive damage to the former mature trees within the proposed APZ area with most trees not surviving the blaze. Due to this, there is no evidence of the dead vegetation areas providing or being used as habitat for fauna with no fauna, wombat burrows, hollows or nest sited on inspection of the site.

No vegetation is proposed to be cleared as shown on the site plan. Post construction, Selwyn Snow Resort is to work with NPWS to maintain the APZ in perpetuity after the devastating impacts of the 2019/2020 bushfires.

In addition to this, the site was selected as it allows for the minimum excavation needed to provide a flat site, reducing the impacts on the environment within Selwyn Snow Resort with separate development applications to be submitted for a Visitor Centre to the West and Staff Accommodation dwellings to the South-West.

There are no recorded or known site or artefacts found within proximity of the proposed Resort Operations Centre and OSSM. Extensive ground disturbance at the proposed site results in the potential of Aboriginal artefacts being found to be very-low.

As a result, the proposed site selection has made every effort to ensure protection of the unique environmental and cultural elements of the Kosciuszko National Park through an environmentally sustainable and thoughtful development. The Resort Operations Centre will provide benefits to the recreational area and provide better management and operation of the Selwyn Snow Resort protecting the diverse cultural and environmental values of Kosciuszko National Park.

5.2.1 Matters to be Considered by Consent Authority (Clause 14 Alpine SEPP)

(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,	No negative impacts on the built and natural environment under this proposal.
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<p>(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 hazards, bush fires and flooding),</p> <p>(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:</p> <p>(i) the capacity of existing transport to cater for peak days and the suitability of access to the alpine resorts to accommodate the development,</p> <p>(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,</p> <p>(iii) the capacity of existing waste disposal facilities or transfer facilities to cater for peak loads generated by the development,</p> <p>(iv) the capacity of any existing water supply to cater for peak loads generated by the development,</p> <p>(d) any statement of environmental effects required to accompany the development application for the development,</p> <p>(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,</p> <p>(f) the <i>Geotechnical Policy—Kosciuszko Alpine Resorts</i> (2003, Department of Infrastructure, Planning and Natural Resources) and any measures proposed to address any geotechnical issues arising in relation to the development</p> <p>(g) if earthworks or excavation works are proposed—any sedimentation and erosion control measures proposed to mitigate any adverse impacts associated with those works,</p>	<p>Geotechnical hazards have been addressed via the geotechnical reports provided (Appendix III)</p> <p>Bushfire Hazard Assessment provided.</p> <p>Flooding is not applicable.</p> <p>The development proposal is part of the re-development of Mt Selwyn Snow Resort and proposed building footprint for Resort Operations Centre is deemed to be satisfactory.</p> <p>Snowy Hydro is working on new bypass of Mt Selwyn Snow Resort, with the existing road to provide a separate access road to the resort. This will provide a safer environment for resort users and staff.</p> <p>Access off Mt Selwyn service road. Potable water to be provided by 280,000L tank South of the proposed Staff Accommodation cabins. OSSM to be installed with connection to larger wastewater treatment facility. Second water supply for bushfire fighting purposes is provided by quarry dam to hydrant system (Visitor Centre DA). Electricity will be provided by new electrical infrastructure which Essential Energy is installing after the impacts of the bushfires. Storm water as per TTW design.</p> <p>SEE provided</p> <p>The intent of the proposal is to seek approval for new Resort Operations Centre providing vehicle repair station and storage, staff facilities and ski patrol, as well as installation of associated essential infrastructure.</p> <p>The proposed appearance and structure of the Resort Operations Centre will complement the natural environment. Mass and bulk of building will not be visible from the street with a setback of approximately 125 metres provided from Kings Cross Road.</p> <p>See geotechnical reports provided (Appendix II)</p> <p>Minimal earthworks and excavation will be required for the Resort Operations Centre. See geotechnical report provided (Appendix II) and SEMP.</p>
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<p>(h) if stormwater drainage works are proposed—any measures proposed to mitigate any adverse impacts associated with those works,</p> <p>(i) any visual impact of the proposed development, particularly when viewed from the Main Range</p> <p>(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</p> <p>(k) if the development involves the installation of ski lifting facilities and a development control plan does not apply to the alpine resort:</p> <p style="padding-left: 20px;">(i) the capacity of existing infrastructure facilities, and</p> <p style="padding-left: 20px;">(ii) any adverse impact of the development on access to, from or in the alpine resort,</p> <p>(l) if the development is proposed to be carried out in Perisher Range Alpine Resort—</p> <p style="padding-left: 20px;">i. the document entitled <i>Perisher Range Resorts Master Plan</i>, as current at the commencement of this Policy, that is deposited in the head office of the Department, and</p> <p style="padding-left: 20px;">ii. the document entitled <i>Perisher Blue Ski Resort Ski Slope Master Plan</i>, as current at the commencement of this Policy, that is deposited in the head</p>	<p>Stormwater is proposed to be drained to the north as per the drainage arrangements of the previous development with a peak discharge of 48l/s. A stormwater assessment by TTW found: “Due to all the works area being previously developed and containing impervious areas, the peak stormwater discharge from the developed site did not increase over the existing conditions. As such a detention strategy is not required.” (Appendix III).</p> <p>Selwyn Snow Resort cannot be seen from the Main Range and is not located within an area identified as having exceptional natural and cultural significance. The resort area is identified as an area of exceptional recreational significance with its rich ski history dating back to the goldrush and being one of four important ski resorts within NSW. The proposed Resort Operations Centre has been designed to complement the natural area and will be consistent with the re-development of the guest facilities and operations centre.</p> <p>Summer operations are for maintenance and management only with a maximum of 5 staff members at any given time.</p> <p>Not applicable.</p> <p>Not applicable.</p>
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<p>office of the Department,</p> <p>(m) if the development is proposed to be carried out on land in a riparian corridor—</p> <ul style="list-style-type: none"> i. the long term management goals for riparian land, and ii. whether measures should be adopted in the carrying out of the development to assist in meeting those goals. 	<p>Proposed Resort Operations Centre and infrastructure is not located within 40m of a riparian corridor.</p>
<p>(2) The long term management goals for riparian land are as follows—</p>	
<ul style="list-style-type: none"> (a) to maximise the protection of terrestrial and aquatic habitats of native flora and native fauna and 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. 	<p>Proposed Resort Operations Centre and infrastructure is not located within 40m of a riparian land.</p>

5.2.2 Additional matters to be considered for buildings (Clause 15)

<p>(1) Building height</p> <p>In determining a development application for the erection of a building on land, the consent authority must take into consideration the proposed height of the building (where relevant) and the extent to which that height—</p>	
<ul style="list-style-type: none"> (a) has an impact on the privacy of occupiers and users of other land, and (b) limits solar access to places in the public domain where members of the public gather or to adjoining or nearby land, and (c) has an impact on views from other land, and (d) if the building is proposed to be erected in Thredbo Alpine Resort—has a visual impact when viewed from the Alpine Way, and (e) if the building is proposed to be erected in Perisher Range Alpine Resort—needs to be limited so as to assist in maintaining the 	<ul style="list-style-type: none"> No adjoining residential or commercial developments. No solar impact in relation to overshadowing from the proposed works. Proposed development not visible from neighboring allotments. Not applicable. Not applicable.

<p>skyline when viewed from Kosciuszko Road and any other public roads, and</p> <p>(f) if the building is proposed to be erected in an alpine resort other than Thredbo Alpine Resort or Perisher Range Alpine Resort—is similar to existing buildings in the resort where it is proposed to be erected, and</p> <p>(g) if the building is proposed to be erected in Bullocks Flat Terminal—relates to the topography of its site.</p>	<p>Not applicable.</p> <p>Not applicable.</p>
<p>(2) - Building Setback</p> <p>In determining a development application for the erection of a building on land, the consent authority must take into consideration the proposed setback of the building (where relevant) and the extent to which that setback—</p>	
<p>(a) assists in providing adequate open space to complement any commercial use in the alpine resort concerned, and</p> <p>(b) assists in achieving high quality landscaping between the building and other buildings, and</p> <p>(c) has an impact on amenity, particularly on view corridors at places in the public domain where members of the public gather, and</p> <p>(d) is adequate for the purposes of fire safety, and</p> <p>(e) will enable site access for pedestrians, services (including stormwater drainage and sewerage services) and the carrying out of building maintenance, and</p> <p>(f) will facilitate the management of accumulated snow.</p>	<p>Staff common area provides adequate open space for meals and breaks.</p> <p>Natural environment surrounding the proposed resort operations centre to be maintained to meet APZ requirements in perpetuity.</p> <p>Provides much needed facilities and amenities for the operation of the alpine resort and complements natural environment and will create visual interest.</p> <p>Fire safety provisions to be met.</p> <p>Adequate access provided to the proposed Resort Operations Centre.</p> <p>The roof structure and pitch has been designed to reduce snow build up. Main entry and exit have been designed adequately to reduce the likely hood of snow falling onto these areas with awnings provided.</p> <p>There are no anticipated issues regarding snow push material and sediment will be captured by this area. It is proposed this material will be pushed to the landscape area to the North of the Resort Operations Centre. See Appendix III for further information.</p>

(3) Landscaped Area

In determining a development application for the erection of a building on land, the consent authority must take into consideration (where relevant) the extent to which landscaping should be used—

(a) as a means of assisting in the protection of the unique alpine environment of the alpine resort concerned, and to maximise its natural visual amenity, for the benefit of visitors and natural ecosystems, and	No vegetation is proposed to be removed as part of this application. Future clearing to maintain APZ in perpetuity to be in consultation with NPWS.
(b) to assist in the provision of adequate open space to complement any commercial use in the alpine resort concerned, and	Resort Operations Centre provides private internal space for staff in form of common staff room for meals and breaks. The ROC will aid the commercial operations of the resort. A
(c) to limit the apparent mass and bulk of the building, and	
(d) as an amenity protection buffer between the proposed building and other buildings,	ROC not located on street frontage to limit mass and bulk of structure and create visual interest.
(e) as a means of reducing run-off, and	See stormwater design.
(f) to protect significant existing site features and limit the area of any site disturbed during and after the carrying out of development.	No significant existing site features identified on site.

5.3 Other approvals Rural Fires Act 1997

The proposed resort operations centre is identified as being on bushfire prone land, an approval is required from the NSW Rural Fire Service (RFS) under Section 100B of the Rural Fires Act 1997 in the form of a Bushfire Safety Authority. See bushfire hazard assessment provided to be submitted to the RFS as part of this application.

5.4 Environmental Planning and Assessment Act 1979 (203)

5.4.1 Objects of the EP&A Act

The proposed development is consistent with the definition of ecologically sustainable developments (ESD) as the staff accommodation dwellings have regard to the ESD principles in accordance with the objects of the EP&A Act.

See consideration of the objectives in Section 1.3 of the EP&A Act below:

Object of the EP&A Act	Consideration
(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources	Re-development of Selwyn Snow Resort after the 2019/2020 bushfires will have a positive social and economic welfare on the region. Providing a new Resort Operations Centre will allow for proper management of the resort for the use as recreation area and create a safe environment for visitors while protecting the natural environmental values of the resort.

(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment	Thoughtful planning and site selection for the re-development of the alpine resort area and the resort operations centre will have positive economic and social impacts as well as minimal impact on the environment.
(c) to promote the orderly and economic use and development of land	The proposed development will provide Resort Operations Centre for management of the resort which promotes an orderly and economic use of the site.
(d) to promote the delivery and maintenance of affordable housing	Not applicable.
(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats	No predicted impacts to the environment from the proposed development have been found. Hence is considered as ecologically sustainable development. See assessment provided.
(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),	The proposed Resort Operations Centre will not impact upon cultural heritage, including Aboriginal cultural heritage or Mining cultural heritage. See assessment provided.
(g) to promote good design and amenity of the built environment	Proposed Resort Operations Centre will complement the natural setting and are well suited for the re-development of the alpine resort and rebuilding of the built environment.
(h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants	Proposed Resort Operations Centre will comply with requirements of 7b and 5 structures and have been designed to meet the requirements of BAL40 to promote the health and safety of occupants.
(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State	Integrated development application with NPWS and NSW Rural Fire Service.
(j) to provide increased opportunity for community participation in environmental planning and assessment.	Development application to be place on Department's website.

5.4.2 Biodiversity Conservation Act 2016

Section 1.7 of the EP&A Act requires the application of the Biodiversity Conservation Act 2016 (BC Act) in connection with the terrestrial environment.

It is vital that all development and clearing follows the Biodiversity Offsets Scheme which has been created to avoid, minimise and offset impacts on biodiversity.

No vegetation clearing is proposed as part of this application, nor to establish APZ. Proposed clearing is below the clearing threshold and the site is not located within an area identified with high biodiversity values on the BVM. The proposal will not have a significant effect on threatened species

or ecological communities or their habitats as per flora and fauna assessment by ecologist, David Woods, and is not declared as an area of outstanding biodiversity value within Kosciuszko National Park. As a result, biodiversity offsets do not apply as part of this application.

See Biodiversity and Aboriginal Heritage assessment provided for full assessment of the four triggers of the Biodiversity Offsets Scheme.

5.5.3 Considerations under section 4.15 of the EP&A Act

In determining a development application, a consent authority must take into consideration the matters referred to in Clause 4.15 (1) of the EP&A Act as are of relevance to the development:

4.15 – 1 (a) (i) the provisions of an environmental planning instrument

The applicable environmental planning instrument is State Environmental Planning Policy (Kosciuszko National Park — Alpine Resorts) 2007.

4.15 – 1 (a) (ii) the provisions of any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved)

None are applicable to the proposal.

4.15 – 1 (a) (iii) the provisions of any development control plan

None are applicable to the proposal.

4.15 – 1 (a) (iiia) the provisions of any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4

None are applicable to the proposal.

4.15 – 1 (a) (iv) the provisions of any Regulations (to the extent that they prescribe matters for the purposes of this paragraph)

Clause 92 —The subject site is not within the coastal zone. No demolition works proposed.

4.15 – 1 (b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality

Natural Environment: Impacts on the natural environment will be minimal, with the proposed Resort Operations Centre to be located on previous disturbed land of former resort facility buildings. The proposed Resort Operations Centre is to be on land with extensive ground disturbance and hence unlikely to have any negative impacts on the environment. Proposed development presents low risk to significant species as outlined in flora and fauna assessment provided by David Woods.

Built Environment: The proposed Resort Operations Centre will complement the natural environment and is part of a larger re-development of the Selwyn Snow Resort after the devastating 2019/2020 bushfire season. Steel construction is proposed to be coloured monument that will give the building a modern look that is intended to add interest as well as complement the surrounding environment as well as the built environment of Kosciuszko National Park and Snowy Mountains region. The overall changes to the built environment are considered of positive influence on the locality.

Social and Economic impacts in the locality: The proposed Resort Operations Centre and essential infrastructure have been designed to minimise any amenity impacts within the Kosciuszko National Park and is not expected to generate any negative social or economic issues. The new operations centre will provide greater amenity for staff to provide a greater service to recreational users of the alpine resort as well as ensure proper management and maintenance can be carried out.

The investment in the building will result in a positive economic impact with a number of short-term construction jobs being generated. Additionally, the resort operations centre will provide daytime amenities for up to 90 staff members (shift workers) during the winter season, with the Resort Operations Centre to be occupied with up to 20 staff members at any one time.

4.15 – 1 (c) the suitability of the site for the development

Selwyn Snow Resort is one of four alpine resorts within NSW are important due to their economic and social contribution as well as their location within a unique alpine environment.

Facility buildings which serviced Selwyn Snow Resort experienced extensive damage during the 2019/2020 bushfire season and have since been removed from site. As a result, the site is currently clear of buildings with only lifts and snow making infrastructure remaining. The proposed development of Resort Operations centre is deemed to be of a positive influence to both the Mt Selwyn Snow Resort and Kosciuszko National Park by offering essential operations amenities for staff to manage the resort and encourage use of the National Park as a recreational area.

The proposed location of the Resort Operations Centre is similar to the previous structure to the East off the existing path of Kings Cross Road (bypass soon to be constructed) and accessed via the service road. This location is clear of structures and vegetation and allows for substantial APZs to be maintained in perpetuity within the allotment boundary (see bushfire hazard assessment report provided).

The replacement Resort Operations Centre is proposed to be located within an existing cleared area of Selwyn Snow Resort. The proposed site location allows for adequate APZ distances to meet requirements for SFPP development with minimal vegetation clearing as well as allow easy forward entry and exit to the existing path of Kings Cross Road for firefighting vehicles.

In addition to this, the proposed site location of the Resort Operations Centre is within an area of disturbed vegetation removal and allows for the least removal of damaged vegetation from the 2019/2020 bushfire season. The proposed site also allows for the minimum excavation needed to provide a flat site reducing impacts to the environment. Likewise, there have been no known Aboriginal artefacts found during construction of previous structure and the proposed new Resort Operations Centre and OSSM location have both experienced extensive ground disturbance from past developments. Local regrading of the existing gravel service road will also present very-low risk of Aboriginal artefacts being impacted nor from connecting services with service trenches established within the Visitor Centre Development Application and connections to building will traverse extensively disturbed ground.

As a result the proposed Resort Operations Centre acknowledges the environmental and cultural significance of the area and has proposed a thoughtful re-development of the site and hence

improves the long-term resilience of Mt Selwyn Snow Resort while maintaining the environmental values of the Kosciuszko National Park.

The proposed site demonstrates a siting pattern and orientation to fit the property boundaries, access road and landfalls. Set on a ridge, the land falls to the North of the site and to the South which has been previously cleared for use as ski runs. Snowy Hydro is proposing to construct a new 10m wide road to the West of the existing carpark to replace the existing route of Kings Cross Road through the Selwyn Snow Resort carpark. This not only allows for greater bushfire protection to occupants but will also reduce non-tourist and staff related traffic to the resort area. Electricity infrastructure will be reinstalled to the site by Essential Energy which will service the Resort Operations Centre.

A 576,000L dedicated firefighting water supply is proposed within the Quarry located atop the Selwyn Ski Resort for the Resort Operations Centre and Visitor Centre which will be connected to a hydrant system as per the Visitor Centre Development Application.

Geotechnical issues have been considered in the geotechnical report submitted with the application. The Geotechnical engineer found the site to be class "S" (*slightly reactive*) and "In the present conditions, the overall risk to property and people is assessed to be "Very Low" to "Medium".

The proposed development will not create biological or ecological impacts or impacts on the fauna and flora. Ecologist. David Woods found:

"No threatened flora was detected and habitat potential for most threatened species was absent or greatly diminished. The proposed redevelopment and associated activities pose no risk to threatened species or threatened ecological communities given the information provided and, in the context prescribed, discussed in this report. Therefore, no 'Test of Significance' under the BC Act or the Commonwealth's 'Significant Impact Criteria' under the EPBC Act was applied. However, future vegetation clearing could require specialised fauna survey methods to be employed and respective significant impact criteria to be tested against possible candidate species and communities."

As per the biodiversity and Aboriginal heritage assessment provided, the proposed development will not trigger the Biodiversity Offsets Scheme nor have an impact on cultural heritage, both Aboriginal and Mining heritage have been considered.

Further re-development of Selwyn Snow Resort has been applied for under separate development applications to provide essential developments including Visitor Centre and Staff Accommodation to facilitate safe management and efficient operation of the resort.

4.15 – 1 (d) any submissions made in accordance with this Act or the regulations

The Consent Authority may require that the application be notified to adjoining properties and lessees. Submissions will be able to be made on the NSW Planning and Environment website once the application is on exhibition

4.15 – 1 (e) the public interest

The development proposal satisfies the objectives of the State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007 and is considered positive in terms of the public interest.

6.0 Conclusion

Suitability of the site for development

The proposal complies with the relevant environmental planning instruments and policies. The Statement of Environmental Effects confirms that the site is suitable and capable of sustaining the proposed development, with no adverse impacts.

Submissions Made in Accordance with the Act or regulations:

Given the proposals minimal environmental it is unlikely to raise significant objection.

The Public Interest

The proposal is in the public interest as:

- It provides a sustainable land use.
- The proposal is suitable within the locality.
- The proposal is positive in terms of the amenity of the area.

7.0 Document List

Consultant	Document	Rev	Date
ACT Geotechnical Engineering	Geotechnical Investigation and Slope Stability Risk Assessment Report (including Form 1)		July 2020
ACT Geotechnical Engineering	Geotechnical Investigation and Slope Stability Risk Assessment Supplementary Report (including Form 1)		September 2020
Complete Town Planning	Bushfire Hazard Assessment	01	October 2020
Complete Town Planning	Biodiversity and Aboriginal Heritage Assessment	02	November 2020
Complete Town Planning	Statement of Environmental Effects	01	October 2020
Complete Certification	BCA Compliance Report	02	November 2020
Cook and Roe	Structural Design Certificate		14 October 2020
Cook and Roe	Structural Plans (S.030, S.050, S.051)	B	October 2020
David Woods	Flora and Fauna Assessment Report		October 2020
John Raineri & Associates	Electrical Services Plan	P3	October 2020
Kleinfelder	Design Guidance Document: Fuel Storage	A	19 October 2020
Sissons Architecture	Architectural Plans (PL3-00-01, PL3-00-02, PL3-00-03, PL3-00-04, PL3-00-05, PL3-00-07, PL3-00-08, PL3-10-01, PL3-10-03, PL3-10-05, PL3-11-01, PL3-11-02, PL3-11-03, PL3-12-01,	A	19 November 2020

	PL3-12-02, PL3-13-01, PL3-13-02, PL3-14-01, PL3-15-01, PL3-16-01, PL3-17-01)		
Taylor Thomson Whitting (TTW)	Civil Traffic & Hydraulics DA Report	209064	19 November 2020
Taylor Thomson Whitting (TTW)	Civil Engineering Plans (C101-D, C110-D, C120-F, C040-E, C150-C, C180-D)		October 2020
Viridis Australasia	Section J Compliance Report	0.2	18 November 2020

8.0 Site Environmental Management Plan (SEMP)

As detailed in the Statement of Environmental Effects, the proposed Resort Operations Centre and infrastructure will generate minimal impacts.

- Minimal site clearing activity will occur through this project.
- No flow paths will be altered as a result of this development.
- Scaffolding will be erected at natural ground level (directly underneath the proposed deck location) during the construction phase in order to reach the proposed construction zone.
- Construction vehicles will enter the site via the existing site entry.
- Construction vehicles will park in the sites existing designated car parks.
- All construction materials will be stored within the existing site car parking zone.

Dust Control

Works involving dust dispersion will use water spray to help keep material damp and dust down. Covers will be placed over waste storage areas and piles of excavated materials to prevent dust dispersion. When transporting materials that cause dust they will be dampened and covered before moving.

Litter Control

Litter control around the site is the responsibility of all on site. A daily site clean up to reduce litter around the site and prevent any possible hazards it causes will be performed. It is the subcontractor's responsibility to leave the work area neat, clean and free of litter. Litter collected can be placed in bins or specified areas and disposed of at the local council tip.

Emergency Procedures

In case of an emergency, the following key emergency response contacts are:

Organisation	Emergency Phone	Non Emergency Phone
NSW Police	000	Adaminaby: 02 6456 2244
NSW Fire and Rescue	000	Cooma: 02 6452 2037
NSW Ambulance	000	Cooma: 02 9320 7777
Cooma Hospital	02 6455 3222	
National Parks and Wildlife Service (NPWS)/OEH	1800 629 104	Snowy Region: 6450 5600 Jindabyne: 6450 5555
Roads and Maritime Services	Traffic incidents & road conditions: 131 700 Road closures and special events: 132 701	
EPA Environment Line	131 555	
NRMA Road Service	13 21 32	

Noise control

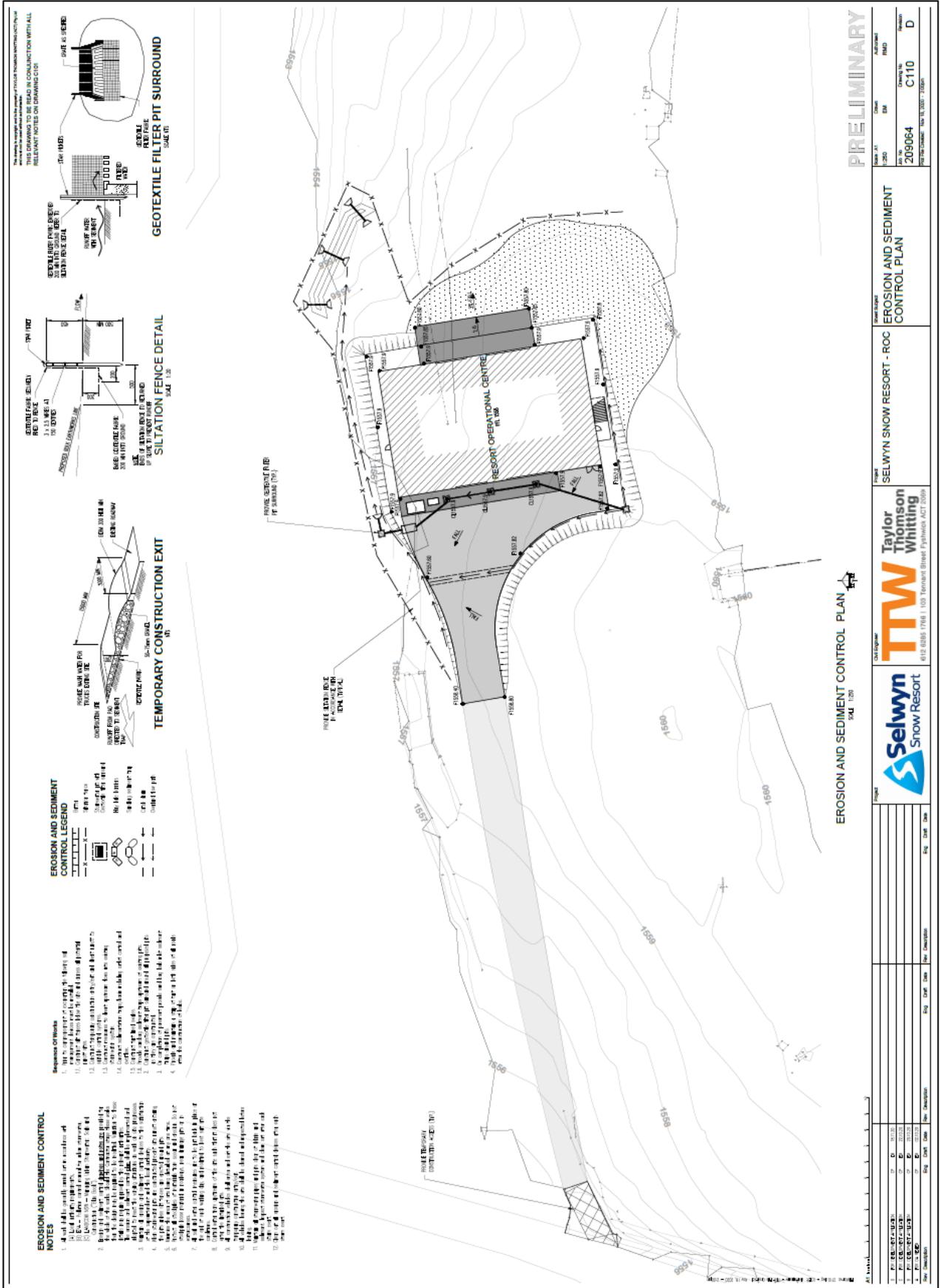
Noise on a construction site can become a form of pollution to the local environment through the use of plant, machinery and tools. For protection of employees and visitors to the site they are issued with PPE including ear protection.

To reduce noise pollution from site the following procedures will be followed:

- All plant, machinery and tools will be maintained in good working order at all times;
- Work involving noisy tools or machinery to be used inside the building structure when possible;
- Strict hours of operation for each site will be implemented to reduce noise pollution to the surrounding areas
- In the instance of receiving a complaint in regards to noise levels immediate rectification will occur as far as practical.

Fuels & Chemicals

No fuel or chemicals will be stored onsite during construction.



8.0 References

ENFAC 2009 *Natural and Cultural Inventory of Selwyn Snowfields Lease Area* Report to DECC.

Feary, Dr S. 2010 *Aboriginal Archaeological Assessment* Report to DECC.

Wesson S 2000 *An historical atlas of the Aborigines of eastern Victoria and far south-eastern New South Wales*. Monash Publications in Geography and Environmental Science, Number 53. Monash University: Melbourne.

APPENDIX I – FLORA AND FAUNA ASSESSMENT (DAVID WOODS, 2020)

FLORA AND FAUNA ASSESSMENT

Proposed Redevelopment

for

Selwyn Snow Resort

213A Kings Cross Road, Kiandra, NSW, 2630



Prepared by David Woods

for

TSA Management (on behalf of Selwyn Snow Resort P/L)

October 2020

Traditional Owner Acknowledgement

The author would like to pay his respects to the traditional owners, Wolgal, the original custodians of the land upon which this assessment and field work was carried out.

Documentation

Project Name	Flora and Fauna Assessment – Proposed Redevelopment for Selwyn Snow Resort Inclusive of Guest Facilities, Resort Operation Centre, Quarry Dam Augmentation & Asset Protection Zone Selwyn Snow Resort, 213A Kings Cross Road, Kiandra, NSW, 2630	
Prepared for:	TSM Management (Marko Osti)	
Author	David Woods	
Draft Reviews	24/10/2020 (internal)	25/10/2020 (external)
Final Document	25/10/2020	

David Woods
PO Box 891
JINDABYNE NSW 2627
(p) (02) 64578156 (m) 0417229015
david.woods@skymesh.com.au

Disclaimer

This report has been prepared in accordance with the brief provided by the client(s) and has relied upon the information collected at the time and under the conditions specified in the report. Time, budgetary constraints and reliance upon other project elements contribute to the parameters defining this work including survey effort, information gathering and the preparation of this report. All findings, conclusions or recommendations contained in the report are based on the circumstances stated above.

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Definitions and Acronyms used in this Report

APZ	Asset Protection Zone
BC Act	NSW <i>Biodiversity Conservation Act, 2016</i>
BC Regulation	NSW <i>Biodiversity Conservation Regulation, 2017</i>
BAM	Biodiversity Assessment Method
BOS	Biodiversity Offset Scheme
CEEC	Critically Endangered Ecological Community
DP	NSW Department of Planning
DPIE	NSW Department of Planning, Infrastructure and Environment
EEC	Endangered Ecological Community
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act, 2009</i>
FM Act	NSW <i>Fisheries Management Act, 1994</i>
NPWS	NSW National Parks and Wildlife Service
PCT	Plant Community Type
PMR	Protected Matters Report
ROC	Resort Operation Centre
TEC	Threatened Ecological Community

SUMMARY

A flora and fauna assessment was undertaken at Selwyn Snow Resort, 213A Kings Cross Road, Kiandra, NSW. The proponent wishes to build new Guest Facilities and a Resort Operation Centre (ROC) following the loss of most buildings during the January 2020 bushfire. These buildings will mostly site on the previous building envelope of the former resort. The proponent also wishes to increase the volume of water for snow making purposes that is currently retained in a former quarry. The proposal is to increase the current embankment at the front of the quarry by approximately 1.5 metres to increase the current full-dam level by approximately 1 m. Associated with each of the proposed Guest Facilities and ROC is an Asset Protect Zone (APZ). Part of the APZ includes roads and carpark. However, the APZ also includes part of the ski slope where vegetation is maintained short for ski slope use and management, and a more natural area of trees and shrubs to the north and west of the proposed buildings. Collectively the Guest Facilities, ROC, quarry dam augmentation and APZ areas form part of the survey area and have been referred to in this report as the 'Proposed Redevelopment'. A separate development application has been prepared for proposed staff accommodation and an associated water pipe and water tank. Some of the survey effort for that application was undertaken at the same time for this assessment.

A field survey was undertaken on 15th October 2020 following a database and literature review of candidate threatened species either known in the area or possibly occurring based on landscape vegetation. Threatened flora from the filtered species list was targeted while fauna was appraised based on habitat opportunity, both before the bushfire and in the context of the status of recovering vegetation approximately 10 months after the bushfire. The results of the field survey included 117 vascular plants of which 67 species were native, 40 were exotic and a further 10 species were unable to be identified to genus level (four grasses and six forbs) due to the time of year and regrowth status since the fire. Incidental fauna was also recorded and included 19 birds, five mammals (two native and three introduced), one amphibian and two reptiles.

No threatened flora was identified in the building footprint of the proposed buildings, dam embankment or in the associated APZ areas. Fresh Broad-toothed Rat scats were identified approximately 70 m south along Clear Creek from the existing pump house, but more than 330 m distant from the boundary of the closest APZ identified in this report. Some elements of Montane Peatland were also identified outside of the proposed APZ although these communities were showing little signs of regrowth at the time of the field assessment. For most parts, habitat opportunity has been lost or degraded within the survey area as a result of the bushfire. Most trees have lost their canopy and there is very little shrub understorey in or adjacent to the resort. In some areas, regrowth vegetation has completely covered the ground (southern APZ areas) while in other areas ground cover is patchy. Areas of trees and shrubs are showing signs of regeneration from basal coppice regrowth but at this stage there is very little ground debris of logs and branches – most having been consumed in the fire. However, overtime many of the habitat attributes present before the bushfire will be re-established (assuming no further high intensity wildfire in the near future).

At the time the field survey was undertaken, habitat complexity and opportunity were considered low, particularly around the northern and western APZ. However, as the vegetation starts to recover and tree debris is added to the ground, so too will the habitat opportunity for threatened species be improved. How the vegetation will be managed and to what extent will need to be subject to future discussions that will also need to be made in the context of the recovery status of the vegetation to be targeted and whether any threatened species are present at that time. The presence of several noxious weed species before the fire and those recorded in this assessment, should be managed to reduce competition with native species during this period of sensitive post-fire recovery.

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1 INTRODUCTION

1.1 Background

This flora and fauna report is to support a Development Application to the NSW Department of Planning for Selwyn Snow Resort P/L to construct new Guest Facilities and a Resort Operation Centre following the loss of most buildings and infrastructure to a bushfire in January 2020. The assessment is to account for the proposed building footprint and proposed asset protection zone for these developments. Important to the resurrection of Selwyn Snow Resort as a winter tourist destination, but not fire affected as a result of the January 2020 bushfire, is the augmentation of the current quarry that is used as a snow making dam. It is proposed to increase the volume of the dam by raising the height of the existing embankment by 1.5 m. For the purpose of this assessment, the Guest Facilities, Resort Operation Centre (ROC), APZ and quarry dam augmentation is collectively referred to as the 'Proposed Redevelopment for Selwyn Snow Resort' (see Figures 1, 3 and 4).

A separate Development Application has been prepared by Complete Town Planning for six staff dwellings further to south of the proposed Guest Facilities and ROC. A flora and fauna assessment was also undertaken as part of that submission to account for a new pipe to provide potable water to a water tank that will serve those dwellings as well as increase fire-fighting capabilities in the resort (see Figure 2). That flora and fauna assessment was provided as an addendum to the Staff Accommodation submission, but the field work was undertaken at the same time as the data collected for this assessment. This report includes reference to the data for the proposed water pipe where it is relevant to account for information on the southern areas of the resort.

For the proposed Guest Facilities and ROC, the building footprint will be located over much of the previous footprint associated with buildings prior to the bushfire. The configuration of the building sites will be different to the previous building arrangements, but they will still be located along the northern perimeter of the resort adjacent to Kings Cross Road and carpark, and the previous management road. Furthermore, and more importantly as it pertains to environmental impact, the Guest Facilities and ROC will occupy mostly disturbed ground. At the time this survey was undertaken, all remnants of the burnt buildings and structures had been removed. A portable barrier fence had been erected around proposed building areas and the colonising vegetation was mostly an exotic flora, consistent with those species present in heavily, and subsequently maintained, disturbed sites.



Image 1: Facing east, much of this cleared area is proposed to site the Guest Facilities. Projected further up the centre of the image will be the proposed ROC. A yet to be confirmed Sewerage Plant is tentatively proposed left of centre of the image.



Figure 1: Location of the Guest Facilities, Resort Operation Centre and Quarry Dam. The Guest Facilities and ROC overlap with the footprint of the previous resort buildings that can be seen from the superimposed image taken before the January 2020 bushfire. Management and staff accommodation have been relocated to a proposed site further to the south adjacent to Kings Cross Road. Coloured polygons relate to significant environmental attributes (source: map provided by TSA Management).



Figure 2: Location of the proposed Water Pipe, Water Tank and Staff Accommodation at Selwyn Snow Resort between the proposed water tank and existing pump house. These proposed assets are part of a separate development application, but some of the fauna habitat assessment was undertaken in this area and discussed in this report. The location of fresh Broad-toothed Rat scats is shown. The aerial image precedes the January 2020 bushfire. No tree canopy remains due to a bushfire in January 2020 (source: base map Google Earth, 2020).

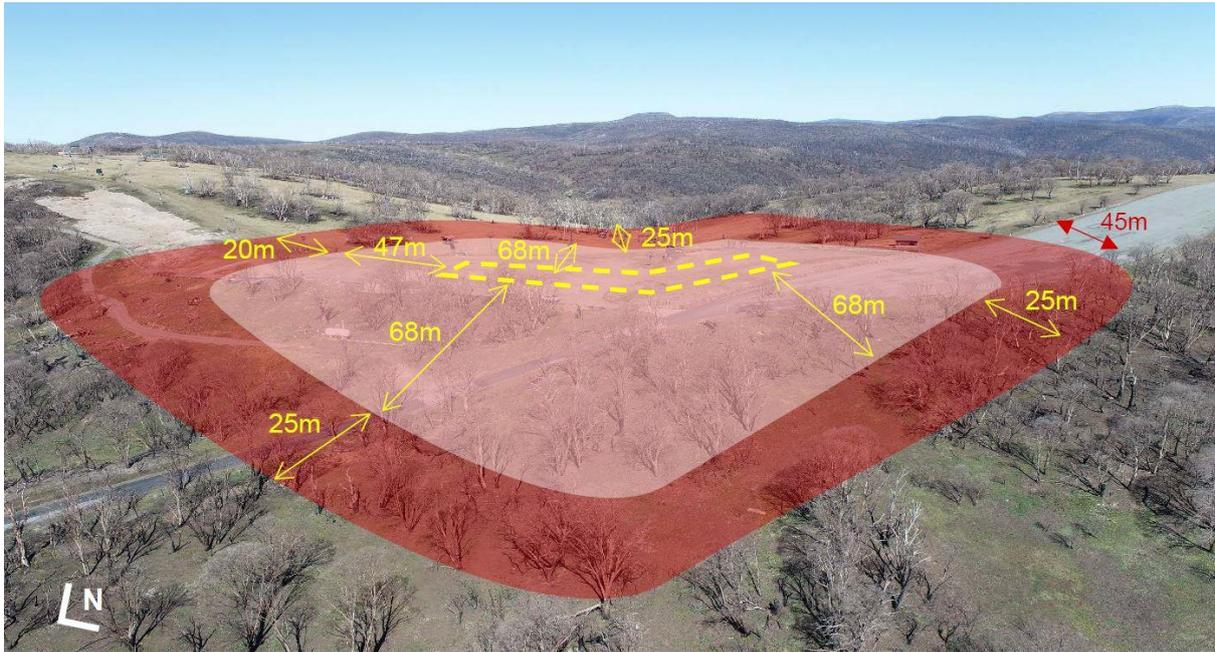


Figure 3: An oblique aerial view from the north-east with the proposed APZ superimposed from table calculations pertaining to the proposed Guest Facilities. The pink shading relates to the Inner APZ and the red shading relates to the Outer APZ (source: Complete Town Planning).

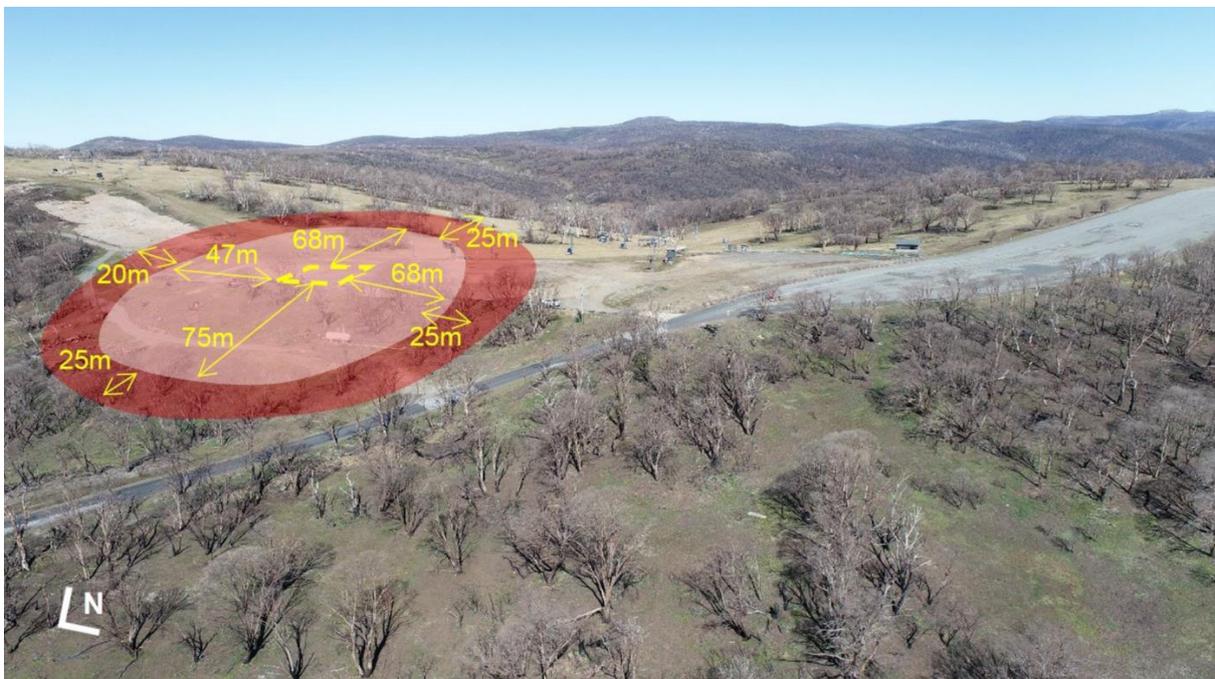


Figure 4: An oblique aerial view from the north-east with the proposed APZ superimposed from table calculations pertaining to the proposed Resort Operation Centre. The pink shading relates to the Inner APZ and the red shading relates to the Outer APZ (source: Complete Town Planning).

1.2 Aim of Flora and Fauna Assessment

This flora and fauna assessment is site-specific to qualify the condition of the existing environment and the potential impacts upon native vegetation, threatened species and threatened ecological communities as it pertains to the construction of proposed Guest Facilities, Resort Operation Centre and augmentation of the existing quarry dam. Associated with the Guest Facilities and ROC is the APZ. The assessment extends to the existing environment as indicated in Figures 3 and 4 with reference to ecological impacts from the January 2020 bushfire. However, at the time this flora and fauna assessment was prepared, there was uncertainty as to what vegetation clearing would be required to meet inner and outer APZ conditions, and how the APZ would be managed as vegetation started to regenerate. Therefore, this assessment focuses on the environment as observed and recorded in mid-October 2020, approximately 10 months after the wildfire event.

The key elements of this assessment include:

- Review BioNet data, Protected Matters Report and other localised literature for threatened species records
- Flora survey to identify vascular plants and vegetation community types inclusive of the building footprint of the proposed Guest Facilities, ROC and quarry embankment, as well as within the APZ as calculated by Complete Town Planning
- Threatened vascular plant survey for species known within the area and/or aligned to the vegetation type and landscape position of the proposed redevelopment structures and associated APZ
- Habitat assessment for the opportunity of threatened fauna species to occur surrounding the proposed redevelopment structures and APZ, targeting vertebrate species known or possibly occurring within the area, and
- Incidental recording of all vertebrate fauna detected during the site inspection as an indicator of animal activity during the day and in response to vegetation recovery approximately 10 months after the bushfire.

1.3 Survey Area

The proposed survey area of approximately 14 ha ranges from approximately 1540 m asl at the lower parts of the APZ, to approximately 1590 m asl at the quarry dam. At approximately 1550 m asl, an east-west aligned spur includes a relatively flat portion of land that is the historical site of the former resort buildings and the proposed site for the redevelopment. This same ridge forms the northern part of the upper catchment to Clear Creek that is centre to the ski slope to the south, an incline averaging 5 – 10°. On the northern side of the ridge commensurate with the slope for the northern APZ area, the average incline is 10 – 15° although the slope decreases to 5 – 10° around to the west.

Although the southern aspect is a highly modified ski slope where most of the open areas included a reduced shrub cover (before the bushfire), the area is still commensurate with a sub-alpine woodland as indicated by the landscape position of surrounding vegetation. The author also has previous site experience around Mt. Selwyn to account for the vegetation structure in the general area that included isolated and continuous shrub stands away from the ski slope. Some shrub species were also observed to be resprouting across the slope, some from seed and others from root stock burnt during the fire. However, most resprouting vegetation, or plants growing from seed, were less than 10 cm tall, and there was no large scale burnt shrub branches or root boles compared to burnt areas surrounding the resort.

There was little shrub stratum within or adjacent to the ski resort due to the intensity of the bushfire. All tree canopy (*Eucalyptus pauciflora* ssp. *niphophila* [*E.p.* ssp. *niphophila* assumed versus *E.p.* ssp. *debeuzevillei*]) has either been scorched or consumed by fire, and very little ground vegetation was left unburnt. However, since the January 2020 fire and with good rainfall since winter, ground vegetation (grasses, graminoids and forbs) had regenerated in many areas, particularly across the ski slope. Ground cover away from the ski slope, particularly in treed areas, was patchy and in some areas there was no ground vegetation present.



Image 2: A southerly view down Clear Creek from near the middle of the ski slope below the proposed new buildings. The recovery of ground vegetation on the ski slope since the bushfire was good, but patchy in tree covered areas. Little shrub understorey and stratum was present during the survey, both within and adjacent to the resort.

2 METHODOLOGY

2.1 Desktop and Literature Review

A desktop review was undertaken prior to the field survey so that an appreciation was gained on the diverse range of flora and fauna previously recorded in the area and, more specifically, to filter those threatened species and threatened ecological communities either known or predicted to occur within the area. Threatened species, threatened ecological communities and their associated habitats would in turn form the primary target of the field survey. The databases included records derived from OEH BioNet (DPIE 2020a), access to Sensitive BioNet data (Category 2), OEH BioNet Vegetation Classification (DPIE 2020b) and the Commonwealth's Protected Matters Report (PMR) for elements relevant under the *Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act)* (DoEE 2020) (see Appendix 1). A 10 km search radius was used to filter BioNet data and PMR records, although a wider radius was used when interrogating additional location information for some threatened species. Several other species were also considered based on the author's familiarity with the area and following a review of threatened species associated with the relevant Plant Community Type (see Table 1).

Literature review included several past environmental assessments but most relevant to this appraisal was the 'Natural and Cultural Inventory of Selwyn Snowfields Lease Area by ENFAC (2009) and the 'Kosciuszko Resorts Vegetation Assessment by Ecology Australia (2003).

2.2 Field Survey

A site inspection was carried out on 15th October 2020. A meandering traverse was employed to survey across the entire building footprint of the Guest Facilities and ROC, the quarry dam including the inner quarry wall and areas of the proposed embankment, and the APZ zones associated with the two proposed buildings. Within the survey area special attention was given to macro and micro habitat features, an appraisal of standing vegetation and surviving structure and stratum layers, inspection of hollows, logs and boulders, regrowth proliferation by different species following the fire, and any predominance of weeds species, particularly high threat exotics.

All vascular plants including exotic species were recorded according to nomenclature prescribed in the NSW Royal Botanical Database (PlantNET). A qualitative relative abundance score was also applied against each species and notes taken pertaining to any interesting or concerning high threat exotics that could proliferate as a result of the proposed activity, particularly in the context of a fire-affected landscape. The threatened flora identified from database records and literature review became the main target of the search.

No threatened fauna was targeted *per se*, but rather habit as a surrogate indicator of those threatened species known in the area became the focus of the fauna assessment. However, all fauna detected on the day including southern areas of the resort associated with a proposed new water pipe were recorded. Detection included observations, calls and scats.

2.3 Limitations

Surveying vegetation in mid-October above 1500 m in elevation is generally early. Many plants are only beginning to emerge after a winter dormancy, and therefore key attributes including flowers and fruits used to identify plants to species level are often absent. Occasionally plants may retain fruiting material from the previous season, however, this can be reduced in upland areas that succumb to

strong winds, severe frosts and seasonal snow loading. This may be further compounded by pest and native herbivore grazing (e.g. rabbits and macropods) and ski slope maintenance. However, Selwyn Snow Resort did not operate during the 2020 snow season due to major infrastructure loss from the bushfire. This same bushfire event also affected nearly all vegetation within the study area. Consequently, all ground species were regenerating and most shrub species appeared to be either suckering or responding by seedling regrowth.

At the time of the survey, very few vascular plants were in bud and even less were in flower. No grasses were observed to be in flower except for one exotic *Dactylis glomerata*. In contrast, several graminoids (e.g. Cyperaceae and Juncaceae) were in flower, allowing confident identification of plants to species level. The same issue of lacking flowering/fruitlet material also pertained to forbs and shrubs, although several abundant exotic species were in flower.

Therefore, it is possible that some of the targeted threatened species may have been missed or not fully developed to be detected. A slow and concentrated meander search was employed to account for that possibility. Where doubt existed as to part or full species identification, botanical conventions were used to communicate any uncertainty. It is likely that several plant species have gone undetected, but for targeted threatened vascular plants that are also known in the area, these species can generally be identified without the presence of reproductive material (perhaps excluding orchid species). Furthermore, many species identified in this report also reflect the author's relative experience for identifying vascular plants in this type of landscape, although many species were still left identified to the genera level.

For threatened vertebrate fauna, mid-October is a reasonable time for detecting returning seasonal migratory species, particularly woodland birds and microbats, although these vertebrates were not directly surveyed in this assessment. For local species that overwinter including reptiles and amphibians, animal activity at the time of the inspection will depend upon temperatures and other weather conditions, and the circumstances as to when respective species exited brumation and hibernation. However, limitations for detecting species presence is reconciled by focusing on habitat opportunity as a surrogate indicator, and the rationale that each of the development footprints for Guest Facilities, ROC and quarry embankment are highly disturbed sites with little native vegetation. In contrast, the APZ to the north and west of the proposed buildings, while temporarily modified due to the bushfire, retains a better habitat complexity. It is uncertain what structural elements have been lost that were used by species present before the fire without pre-fire site surveys. However, this does not negate the importance of recognising habitat opportunity as a surrogate for animal populations present now and into the future. Furthermore, the level of assessment presented here is also commensurate with the level of impact associated with building on disturbed sites. What is not discussed in any detail, as mentioned above, is the circumstances surrounding any vegetation clearing requirements to meet APZ thresholds. The state of the vegetation, and hence fuel loads, will change over time. How this is to be managed was still subject to discussions between Selwyn Snow Resort P/L, NSW Department of Planning and NSW NPWS. That said, the information contained in this flora and fauna assessment will help with the APZ appraisal, at least as it pertains to conservation elements.

Notwithstanding the challenges and limitations discussed in this section, the author is satisfied that the survey methods and survey effort undertaken in mid-Spring has provided a reasonable understanding as to whether the proposed redevelopment poses any significant risk to threatened species and threatened ecological communities in the area.

3 RESULTS

3.1 Database and Literature Review

The review of data filtered from the BioNet database, the Commonwealth’s Protected Matters Report and in particular the ENFAC report (2009), has culminated in a suite of threatened species and threatened ecological communities as target candidates for the field survey. The list of candidate species is not a total representation of species extracted from databases and literature without some justification for inclusion. As the BioNet data was filtered within a 10 km radius, this two-dimensional filter will invariably include records that occur at lower elevations and species with narrow and unique habitat requirements. Therefore, not every species has been listed for subsequent assessment, but rather a list of candidates based on a possible likelihood of occurrence, even if that occurrence is deemed to be low. The species that were filtered and justified for preliminary assessment are presented in Table 1

Table 1: List of threatened species filtered from database records for their known or potential occurrence in or adjacent to the proposed redevelopment project at Selwyn Snow Resort. The table also includes the conservation status and justification for selection as a candidate species for field assessment. Where data has been extracted from NSW BioNet an indication of the number of site records has been provided within 10 km of the survey area.

Codes:

V – Vulnerable, E – Endangered, CE – Critically Endangered, EEC – Endangered Ecological Community, CEEC – Critically Endangered Ecological Community

Scientific Name	Common Name	NSW Conservation Status	C’lth Conservation Status	Number of Site Records	Likely Occurrence	Justification
FLORA						
<i>Prasophyllum retroflexum</i>	Kiandra Leek Orchid	V	V	1	Moderate	Although only one record within 10 km of Selwyn Snow Resort (a record near Kiandra), the species occurs in sub-alpine grasslands and woodlands, consistent with some of the environment in the survey area (DPIE 2020c). Most plants have been recorded in the Long Plain, Kiandra and Tantangara area. Although the ground vegetation within ski slopes is modified, areas to the north of the proposed buildings in the APZ still retain a reasonable native composition and structure - although some of the ground layer weed vegetation is more intense in this area than on the modified ski slope.
<i>Pterostylis foliata</i>	Slender Greenhood	V	-	1	Low	Although found in several other states, in NSW this species occurs mainly in the Southern Tablelands south from Batlow (DPIE 2020d). The species grows in eucalypt forest amongst an understorey of shrubs, ferns and grasses. It grows on loam or clay loam soils on sheltered slopes and occasionally seepage areas. The one record from 1992 has been denatured, but it is unlikely to occur within Selwyn Snow Resort and probably the montane valleys to the west within

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						10 km of the study area (DPIE 2020a). It is unlikely to be a sub-alpine species.
<i>Discaria nitida</i>	Leafy Anchor Plant	V	-	4	Moderate	Records of this species tend to be scattered either on or close to rocky stream banks or on rocky areas (DPIE 2020e). The species occurs in both woodland and heathy riparian vegetation and on treeless grassy sub-alpine plains (DPIE 2020e). In the local area most records are along the Kiandra Plains. Some of these habitat elements are present in or adjacent to Selwyn Snow Resort. However, most populations survive in sites that appear to be rarely burnt 'fire refugia' as the species is known to be highly fire sensitive and recruitment infrequent. An easy plant to identify if present.
<i>Thesium australe</i>	Austral Toadflax	V	V	10	Moderate	Several records exist for this small straggling parasitic herb. Away from the coast the species occurs in grassland and grassy woodland, often in association with <i>Themeda triandra</i> (Kangaroo Grass) (DPIE 2020f). This species is a moderate candidate for occurring in the survey area as local records exist not far near Cabramurra to the west and in the Kiandra Plain area to the east. A good candidate if Kangaroo Grass is present.
<i>Pimelea bracteata</i>	Rice Flower	CE	-	8	Moderate	Although only 8 site records exist in BioNet, one record is within 1 km to the north of the proposed buildings (DPIE 2020a). However, due to the critically endangered status of this species, the location is likely to be denatured as the record is not commensurate with its known habitat. The species is a localised shrub occurring in wetlands and along waterways and stream edges in high altitude treeless subalpine valleys. The study area is essentially a snow gum woodland and the survey area not aligned to wetland or creek lines (Clear Creek does not truly form until well south of the APZ and the bog/gully vegetation to the north of the proposed APZ is outside of the survey area (DPIE 2020g). However, the species is retained as records include the Kiandra area and the species has declined dramatically from a range of threats including pathogen or invertebrate-induced foliage dieback. An estimated 50% of the range of this species was burnt during the January 2020 bushfire (DPIE 2020g).
<i>Calotis glandulosa</i>	Mauve Burr-daisy	V	V	0	Moderate	No local records in BioNet but this species is found in sub-alpine grassland dominated by <i>Poa</i> spp. and in snow gum woodland (DPIE 2020h). The species also often occurs in disturbed environments where ground disturbance can act as a precursor for seed germination (DPIE 2020h). Habitat elements for this species can be expected around the Selwyn area.
<i>Diuris ochroma</i>	Pale Gold Moths	E	V	0	Low	This terrestrial orchid is better known for its occurrence in the Kybeyan area on the Monaro Tableland (DPIE 2020i), but a

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						population also exists on the sub-alpine plains near Tantangara in Kosciuszko National Park (pers. obs). Habitat at Selwyn not typical of locations known for this species, but kept as a candidate as a precaution.
<i>Leucochrysum albicans</i> var. <i>tricolor</i>	Hoary Sunray		V	0	Low	Frequent populations occur along roadsides along the western fringe and central areas of the Monaro Tablelands. Often occurs in disturbed environments including bare areas. In less disturbed areas it is also known to colonise grassland, woodland and forests (DPIE 2020j). An easy plant to identify when in flower. Although no records in BioNet, the species occurs along the Snowy Mountains Hwy at lower altitudes. Due to its predisposition to disturbed areas, it is kept as a candidate species, albeit low likelihood of occurrence.
<i>Pterostylis oreophila</i>	Blue-tongued Greenhood	CE	CE	0	Low	In Kosciuszko National Park this species is only known from a few small populations. It grows along sub-alpine watercourses under more open thickets of Mountain Tea-tree in muddy ground very close to water, but less commonly in peaty soils and sphagnum mounds (DPIE 2020k). Highly unlikely to occur at Selwyn, but kept as a precaution.
<i>Rutidosia leirolepis</i>	Monaro Golden Daisy	V	V	0	Moderate	In Kosciuszko National Park this species occurs in sub-alpine grasslands, but generally at lower elevations compared to the Selwyn area (DPIE 2020l). Kept as a candidate as a precaution.
<i>Calotis pubescens</i>	Max Mueller's Burr-daisy	E	-	0	Moderate	No local records but grows in sub-alpine treeless plains in herb-rich grassland that is not subject to periodic inundation (DPIE 2020m). The few populations that occur in Kosciuszko National Park include elevation ranges similar to Selwyn, but often in frost hollow or open valleys (pers. obs). Kept as a candidate as a precaution.
FAUNA						
<i>Litoria verreauxii alpina</i>	Alpine Tree Frog	E	V	12	Moderate	In NSW the alpine tree frog usually occur above 1100 m in a wide variety of habitats including woodland, heath, grassland and herbfields (DPIE 2020n) It breeds in natural and artificial wetlands including ponds, bogs, fens, streamside pools, stock dams and drainage channels that are still or slow flowing (DPIE 2020n). Non-breeding habitat and overwintering refuges are poorly known but are likely to include flat rocks, fallen logs, leaf litter and other ground debris (DPIE 2020n). While most vegetation associated with this proposed development is a dry form, the quarry dam is proposed to increase in volume by increasing the height of the embankment by 1.5 m. As the closest BioNet records are within 2 km to the north of the proposed development (DPIE 2020a), this species has been included for further consideration.
<i>Cyclodomorphus praealtus</i>	Alpine She-oak Skink	E	E	1	Moderate	Only 1 BioNet record was retrieved within 10 km of the proposed

						development which was a 1969 entry (DPIE 2020a). Until recently the species' northern distributional limit was thought to be in the Kiandra area, but surveys associated with Snowy Hydro 2 and a PhD study have identified Alpine She-oak Skink further north in the Long Plain area (Schroder pers. comm.). The species has specific habitat requirements preferring treeless or very lightly treed areas that contain tussock grasses, low heath or combination of both (DPIE 2020o). Within this habitat the species shelters beneath litter, rocks, logs and other ground debris, and has been observed basking in tussocks (pers. obs – Rennix Gap). Broad habitat type includes alpine to sub-alpine grasslands in flat to gently sloping areas (DPIE 2020o).
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	-	34	High	This species is frequently observed in the area including snow gum woodland with numerous records over time showing persistence in the Snowy Mountains area. Nesting requirements are generally 10 cm diameter or larger hollows at least 9 m above the ground (DPIE 2020p). In autumn and winter the species is likely to move to lower altitudes.
<i>Pachycephala olivacea</i>	Olive Whistler	V	-	4	Moderate	Olive Whistler prefer moist forests with a thick understorey such as along creek lines or contiguous vegetation in wet sclerophyll forests (DPIE 2020q). The impact of fire upon this species is likely to be great given the extent of the event, consuming wet gully vegetation. The vegetation in the upper Selwyn Snow Resort area was probably not optimum habitat for this species, but further south along Clear Creek habitat was likely to be more favourable. Retained for habitat assessment during the field survey.
<i>Petroica phoenicea</i>	Flame Robin	V	-	60	High	Extending up to the alpine area, this species occupies a range of communities including wet sclerophyll forest, dry sclerophyll forests, woodlands, open woodlands and heathland. As a seasonal and altitudinal migrant, Flame Robin tend to be more prevalent in the area during non-winter months. Flame Robin often forage from low perches (including fence posts and taller vegetation e.g. thistles) from which they sally or launch into the air, on the ground or on other features to pursue insects (DPIE 2020r). Nests are often near the ground and are built in sheltered sites such as shallow cavities in trees, stumps or banks (DPIE 2020r). The species occurs in recently burnt areas but habitat is usually unsuitable following regeneration that results in closed vegetation (DPIE 2020r).
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	11	Low	A suite of recent records to the west at lower elevations in montane dry and wet sclerophyll forest and woodland, are the result of recent surveys pertaining to the Snowy Hydro 2 project. The species has a low chance of occurrence in

						Selwyn pending a habitat assessment, particularly since the fires. Selwyn Snow Resort is at the upper altitudinal limit for this species which have been recorded in Thredbo Village, above which Mountain Pygmy-possum tend to occur, but in specific habitats. It is found in a broad range of habitats from rainforest through sclerophyll forest and woodland to heath, but in most areas woodland and heath appear to be preferred (DPIE 2020s). It feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes. Also feeds on insects throughout the year which may be very important in habitats where flowers are less abundant, particularly after bushfire. Retained pending habitat assessment and the impact of the bushfire.
<i>Matacomys fuscus</i>	Broad-toothed Rat	V	V	19	Moderate	There are several records near Selwyn Snow Resort and fresh scats were identified approximately 70 m south of the pump house on Clear Creek that was assessed as an independent activity to this proposal. The Broad-toothed Rat lives in a complex of runways through the dense vegetation of wet grass, sedge, or heath, and under the snow in winter (DPIE 2020t). Sheltering nests of grass are built in the understorey or under logs, where two or three are born in summer. Food is mostly gathered at night in summer and autumn and during the early evening in winter. The diet consists almost solely of grasses and sedges, supplemented by seeds and moss spore cases (DPIE 2020t). The species has been recorded in and adjacent to the resort. The species has been retained pending assessment of habitat opportunity in the proposed development area and following the impact of the January 2020 bushfire.
<i>Pseudomys fumeus</i>	Smoky Mouse	CE	E	12	Low	Surveys associated with the Snowy Hydro 2 project have detected more Smoky Mouse populations. Most of these records are to the west at lower elevations. Up until the extra survey work, few sites existed. However, Selwyn Snowy Resort is within the elevation range for this species known across south-eastern Australia, albeit in disjunct populations. The Smoky Mouse appears to prefer heath habitat on ridge tops and slopes in sclerophyll forest, heathland, and open forest, up to 1800 m asl (DPIE 2020u). Seeds and fruits from leguminous shrubs form the main summer and autumn diet with some invertebrates (DPIE 2020u). In winter and spring, hypogean fungi with some flowers, seeds and soil invertebrates form the main diet (DPIE 2020u). The species may occur singly or in pairs based around patches of heath. Nesting burrows have been found in rocky localities among tree roots (and Grass Trees where present)(DPIE 2020u). The species has been retained pending habitat appraisal.

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<p><i>Microbats</i></p> <ul style="list-style-type: none"> • <i>Falsistrellus tasmaniensis</i> • <i>Miniopterus orianae oceanensis</i> 	<ul style="list-style-type: none"> • Eastern False Pipistrelle • Large Bent-winged Bat 	V	-	10	High	<p>Two species that have been recorded within 10 km of the proposed buildings have been listed. However, where Eastern False Pipistrelle usually roost in eucalypt hollows, loose bark and buildings (DPIE 2020v), Large Bent-winged Bat tend to favour caves, old mines, stormwater tunnels, buildings and other man-made structures (DPIE 2020w). That said, both species are listed in the same appraisal based on existing records, but also under the auspices of 'microbats' as a vertebrate group to account for other bats not recorded but possibly present in the area. Microbats are cryptic and unless special detection methods are employed (e.g. ultrasonic detection and harp traps), then the group will continue to go unrecorded in many areas. Habitat appraisal will be used to account for roosting, breeding and overwintering opportunities in the survey area. Potential impacts will be assessed against the habitat opportunities for microbats in and adjacent to the survey area.</p>
Threatened Ecological Community						
<p>Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions</p>		EEC	E	-	High	<p>The Montane Peatlands community is associated with accumulated peaty or organic-mineral sediments on poorly drained flats in the headwaters of streams. It occurs on undulating tablelands and plateaux, above 400-500 m elevation, generally in catchments with basic volcanic or fine-grained sedimentary substrates or, occasionally, granite (DPIE 2020x). Several communities have been mapped in and adjacent to Selwyn Snow Resort (see Figure 1). No construction footprint associated with the Guest Facilities, ROC or quarry dam augmentation will affect this community. However, there are elements of montane peatland to the north and north east of the proposed buildings within or bounded by the APZ. Retained for further assessment.</p>

3.2 Field Surveys

3.2.1 Flora

A total of 117 vascular plants were identified within the survey area of approximately 14 ha (see Appendix 2). This included 67 native species, 40 exotic species, four unidentified grasses and six unidentified forbs (unidentified to genus level). Very few species were in flower with the average ground cover height 5 cm, occasionally to 10 cm for some plants. Only one grass species was in flower (*Dactylis glomerata*) making grass identification difficult. In contrast, other graminoids including *Carex breviculmis*, *Carex appressa*, *Isolepis* sp. and *Luzula novae-cambriae* were in advanced stages of inflorescence development (though the author found it difficult to identify the *Isolepis* to species level).

Because of the lack of flowering material, it was difficult to identify many plants to species level, particularly grasses. The author's familiarity with some species allowed some confident determinations, but for many others it was left at the genera level or the species epithet questioned. Due to the predominance of grass cover within the southern survey area including the ski slope, it was also difficult to provide an accurate, although only a relative, cover abundance rating. In contrast to the open grassy vegetation in the south, much of the vegetation in the north of the survey area was part of a structural snow gum woodland, albeit burnt. Ground cover was less contiguous with grasses and forbs but presented as patches of open unvegetated areas interspersed with vigorous regrowth of sprawling native forbs (e.g. *Stellaria pungens*) and introduced weeds (e.g. **Viola arvensis*). There were also extensive patches of weeds surrounding the down slope areas immediately adjacent to the former management road where most resort activities and infrastructure was placed. Some shrub species showed signs of post-fire recovery as did many snow gums with lignotuber shoots emanating from the base of most trees. But most noticeable within the contiguous tree stands in the north and west of the survey area was the lack of tree canopy and the almost total removal of the shrub understorey.

Given the circumstances of the intense and extensive bushfire, the extent and recovery of ground vegetation was relatively good, covering most of the open areas that were burnt. Areas beneath trees showed less recovery which could be a combination of less seed material in those areas due to less plants from tree debris prior to the fire, and the fire intensity around trees being greater due to the prevalence of higher fuel loads.

In the coming weeks when the flora matures and other species germinate, plant identification would be more accurate and the abundance of species across the site better understood, though this dynamic will change over time as some slower growing species become more dominant.

Notwithstanding the challenges to identify plants to species level, and the incursion of introduced species, the proposed site is still a predominately native flora with a high composition of native species. The relative abundance rating used in Appendix 2 pertains to the whole survey area of the APZ inclusive of the proposed building footprints and the less structurally diverse ski slope area. It does not attempt to discriminate between areas in the north and south even though there are species and structural differences between these two areas. In essence the recorded species and relative abundance rating is an assessment of the entire survey area while searching for threatened species and assessing habitat complexity. However, as the Quarry Dam embankment is a separate project not bound to the APZ, those species recorded in an adjacent to the quarry have been listed separately. That said, only one species was recorded associated with the quarry that was not recorded in the broader proposed building and APZ areas, *?Elatine gratioloides*, a partially submerged forb (there was still some uncertainty as to the correct identification of the species). There were 27 vascular plants

recorded that were associated with the quarry entrance including 12 native species, 13 exotic species and two unknown forbs.

Across the survey area the most dominant family was Poaceae with six natives, 11 exotics and four unidentified grasses. The dominant native grass was *Poa sieberiana* var *sieberiana* though it was difficult to determine the relative cover abundance of other native species. Several exotic species were also present though many such as **Holcus lanatus* and **Dactylis glomerata* only occurred in isolated patches. An exception was **Agrostis capillaris* that appeared to have a wide distribution.

Asteraceae species was also well represented with a dominance of native plants (19 native and eight exotic). Many species recorded are common constituent species of sub-alpine woodlands and grasslands in Kosciuszko National Park. Interestingly, Fabaceae was also well represented (four native and seven exotic) with most of the germinating shrub species belonging to this family. Besides *Poa sieberiana* and a mix of other native grasses, inter-tussock forbs were well represented by *Stellaria pungens*, *Asperula* spp., *Ranunculus* spp., *Acaena* spp., *Geranium* spp., *Pimelea* spp., *Scleranthus* spp. and a diverse array of Asteraceae including *Craspedia* spp., *Brachycome* spp., *Celmissia* sp., *Coronidium scorpioides*, *Leptorhynchus squamatus* and *Senecio gunnii*. The suite of native forbs was also matched by the distribution of the introduced **Hypochaeris radicata*, **Trifolium* spp. and the co-dominant **Acetosella vulgaris*. While some exotic species were distributed across the survey area, some species were more prevalent in isolated stands including **Viola arvensis* and **Leucanthemum x superbum*.

Several shrubs were resprouting and/or growing from seedlings including *Daviesia ulicifolia*, *Bossiaea foliosa*, *Hovea* sp. ?*Oxylobium ellipticum* (possibly *Podolobium alpestre*) and *Tasmania xerophila*. All shrub species were in the early stages of regrowth. Within the northern APZ area, both seedlings and lignotuber regrowth from *Eucalyptus pauciflora* were recorded – but very little epicormic response.

In summary, no threatened flora was detected in the survey area nor were the suite of constituent species that form a bog and fen community. There were elements of a bog complex to the north of the APZ area that was severely impacted by the bushfire, but this was beyond the survey area. Similarly, the lower reaches of Clear Creek (as part of the proposed water pipe assessment) contained species associated with damp sites and water ways (e.g. *Carex appressa* and *Geum urbanum*), but not bog. The quarry dam is artificial and there was no remnant species suggesting the site was a former bog or fen. Except for a few localised damp areas, the vegetation across the survey area was mostly a dry form commensurate with a snow gum woodland. This is in part related to the landscape position of the proposed activities being centred on a ridge line and past resort practices of maintaining the ski slope with a low ground cover.



Image 3: Part of the northern APZ associated with the proposed Resort Operation Centre. Many trees in this area were not large to provide good fauna habitat opportunity (e.g. hollows), but tree crowns would have still provided foraging opportunities for a range of bird species. While the above ground tree trunks are dead, technically the tree is still alive as evident by the coppicing base of most trees in the APZ across the survey area. However, ground cover was patchy in some areas of the APZ as depicted in this image (compared to Image 2 [p.10] for southern areas of the ski slope in the same APZ).



*Image 4: A close-up of the patch-like recovery in some northern parts of the APZ. The image shows a native Geranium sp. (largest leafy ground plant) surrounded by the introduced *Taraxacum officinale (yellow flower), *Viola arvensis (pale-coloured flower) and *Acetosella vulgaris (in flower but not easily seen in the image).*

3.2.2 Fauna

Fauna data was collected while conducting other activities including the flora survey and habitat assessment. The time of year was relatively early to maximise detection of vertebrate species. This was compounded by the dramatic habitat change with an almost 100% loss of tree canopy and shrub understorey due to the January 2020 bushfire, which has no doubt reduced fauna species presence and abundance in the area. That said, 19 birds, five mammals, one amphibian and two reptiles were detected (see Appendix 3). A site inspection in late-Spring/early -Summer may detect a greater number of species, but the diversity of fauna on the day of the inspection was surprisingly high given the magnitude of habitat change. During the inspection cloud was approximately 2/8, there was a slight breeze from the north-west and temperatures ranged from 10 to 15° C.

Some birds were heard well distant of the ski resort, but most of those recorded in Appendix 3 were recorded either in burnt canopy, on tree trunks or flying low above the canopy. Many of the species recorded were heard throughout the day. All mammals were detected by scats. Of particular interest were a few fresh scats of Broad-toothed Rat approximately 70 m downstream of the pump house within the riparian corridor (well outside the survey area for the proposed redevelopment). This corridor appeared to have a partially contiguous shrub layer before being burnt by the bushfire. Ground vegetation was regenerating including grass tussocks. This was an encouraging sign that Broad-toothed Rat had survived the fire. No sign of Broad-toothed Rat was recorded within any part of the survey area for this assessment. Of the introduced animals, very few scats were observed suggesting that at least both rabbit and hare populations have been greatly reduced since the fire.

Common Eastern Toadlet were heard at two locations – along the creek line near the pump house, and in the quarry that supplies water for snowmaking. Tadpoles were also recorded in the quarry dam. Two reptiles were recorded: two Eastern Three-lined Skinks (one near the quarry and the other on the ski slope taking refuge under a rock) and one Highland Copperhead located to the north of the resort in the proposed APZ. The Highland Copperhead looked relatively thin, which may be due to the lack of available prey, including ground fauna such as lizards, small mammals (e.g. antechinus) and large insects.

Habitat complexity has been greatly reduced since the bushfire, both within and outside of the survey area. Very few rocks and no boulder outcrops were present in the survey area. There was no canopy remaining on the snow gum overstorey and most of the shrub understorey had been destroyed by fire. Some shrub regeneration was encouraging but height of shrub regrowth averaged 10 cm with a few species attaining a height of 15 cm. As described above in the plant results, ground cover was patchy in the northern and western areas within the APZ. Furthermore, there were few logs and other large ground debris that could provide refuge for ground dwelling fauna. The lack of logs indicates a high intensity wildfire when large ground fuels had very little moisture content, and the fire behaviour included a relatively long-residency time in the area that consumed large fuel types that would otherwise persist in fires of lower intensity. The same fire behaviour has also changed the habitat opportunity that existed amongst the larger trees before the fire, either by destroying the existing hollows, or in some cases, increasing hollow size and creating hollows that didn't exist prior to the fire.

For each of the threatened species identified in Table 1, if they have survived the January 2020 bushfire, then habitat following the fire up until the date of this survey has been greatly diminished or removed entirely. That said, habitat opportunity will improve over time as the vegetation regenerates. Many of the existing habitats lost during the January 2020 bushfire will be reinstated over time, subject to no further large conflagrated events, at least for the next 20 years. Twenty years should see a recovery of a shrub layer and ground material increased from falling trunks and branches of some of the surrounding snow gums. However, the trees will take longer to recover as most of the above

ground parts of *Eucalyptus pauciflora* are easily destroyed by fire and contain relatively little regenerative epicormic tissue under the thin bark. Most trees, however, still appeared to be alive as observed by the coppice regrowth emanating from most tree bases. Furthermore, in some sites, seedlings were germinating – this included on the ski slope in areas adjacent to tree stands (island vegetation) and in the northern and western areas of the APZ within the snow gum woodland.

There are encouraging signs of different fauna vertebrate groups occupying areas in and around Selwyn Snow Resort. No threatened fauna was detected in the area although no specialised target fauna surveys were employed for this assessment. However, habitat opportunity on the site for the proposed Guest Facilities, ROC and quarry embankment wall is poor (non-existent). That said, the inner quarry area with its rocky alignment could provide habitat for other reptile species (above the full dam level) and possibly refuge areas for frog species other than *Crinia signifera*. The full spectrum of other habitat requirements to support the critical life-cycle of threatened frog species in the region or *Cyclodomorphus praeltus* were not present, but the quarry by virtue of containing water, rocks and boulders and unburnt shrubs still retains a relatively good habitat complexity compared to many other areas around the resort (e.g. the eastern three-lined skink and common eastern toadlet were record at the quarry site).

In contrast to the development footprints, the APZ area to the south across parts of the upper ski slope area is recovering well with a complete ground cover of vegetation, although rarely exceeding 5 cm height. Habitat complexity for this environment before the bushfire would be considered low, and not provide for too many threatened species known in the area with the exception of Alpine She-oak Skink (assuming it was present). Key habitat features for Alpine She-oak Skink also appears low without appropriate rocky refuge areas or a greater cover of woodland debris. This does not negate the ability of the site to improve in habitat complexity in the future and allow occupancy of Alpine She-oak Skinks from adjacent areas. The prevalence of Alpine She-oak Skink assumes they were present in surrounding areas and a viable population has survived the bushfire to be able to colonise new sites.

Most habitat opportunity associated with the proposed redevelopment pertains to the northern and western areas of the APZ. In these areas most woodland trees still remain, although habitat potential for the immediate future is low until canopied stratum returns (trees and shrubs). Until there is a substantial return of leafy canopy, most threatened birds identified in Table 1 will not be able to nest. Some bat species may find suitable hollows to roost and breed in this area, but other requirements such as food availability will take some time to respond until the total ecosystem starts to recover – most of which is based on plant regeneration.



Image 5: The image was taken within a tree stand at the southern end of the ski slope adjacent to the proposed water pipe. However, it is presented here as a relatively better representation of habitat opportunity compared to many areas in the northern APZ. As tree material starts to fall to the ground and accumulate, then habitat complexity and subsequent fauna opportunity will increase – both for common and threatened species.



Image 6: The quarry dam showing little habitat complexity associated with the embankment that is proposed to increase in height by 1.5 m. However, the inner environment, some of which will be flooded when the dam increases to its new full potential, is more complex than surrounding areas. A separate species list for the area on and adjacent to the current embankment is presented in Appendix 2.



Image 6: Some tree material was cut down during the bushfire event in an attempt to protect some of the resort assets. Other material that had fallen since the fire and was obstructing access was pushed into a pile. As shown in the right of the image, large habitat trees were burnt. Habitat complexity in the northern areas of the APZ will take many years to return to the state that existed prior to the bushfire.



*Image 7: Part of the APZ area to the north-west of the proposed Guest Facilities. Patchy regeneration of native and exotic grasses and forbs, no shrub understorey and basal coppicing of *Eucalyptus pauciflora* was the typical environment present in most sub-alpine woodland when the flora and fauna assessment was undertaken approximately 10 months after the January 2020 bushfire.*

4 IMPACT ASSESSMENT

The results of this flora and fauna assessment did not identify any threatened flora species within the survey area, or suitable habitat that could support any threatened species identified in Table 1 **at the time of the survey**. That said, only flora and threatened ecological communities were targeted during the field survey, with threatened species assessed through habitat opportunity. Furthermore, some species are mobile or may not use one location to fulfill all habitat or niche requirements. However, as the vegetation regenerates in and around Selwyn Snow Resort as a result of the January 2020 bushfire, habitat will also recover and so will the opportunity for many species to reoccupy sites. The presence of habitat, however, does not necessarily guarantee occupancy by common or threatened species. A suite of circumstances needs to occur including the survival and persistence of more localised species (e.g. reptiles and some ground mammals) having survived the bushfire and the challenges posed thereafter including habitat availability, prey and foraging opportunities, increased predation and competition with other surviving species and populations. For more mobile species including birds, micro-bats and larger mammals, the same circumstances are also relevant, except the species has a greater opportunity to search for unburnt or less burnt environments. That said, some of these species could also become prey for larger animals in the short term after fire if refuge and roosting areas are no longer available. Furthermore, if key habitat requirements aren't available or fully sustainable in the area, the species may succumb to hunger, fall prey or unable to breed.

To state the obvious, the proposed building footprint and operational area pertaining to the Guest Facilities and ROC will have no impact upon threatened flora and fauna. The sites are effectively devoid of most native vegetation and for most parts, commensurate with the previous building precinct of the former resort. Similarly, the raising of the earthen embankment by 1.5 m will not have a detrimental impact on any threatened species at the site *per se*, as the site is highly disturbed and retains little habitat complexity. However, other parts of the quarry that serve to retain water for snowmaking does include some habitat variability that could provide opportunity for several species. By raising the wall and subsequent height of the water by an extra 1 m above the current full-dam level, some of the existing habitat will be submerged. That said, it is unlikely that the quarry and dam support threatened species known in the wider area as there are other habitat components missing that would need to be present for any of the threatened species to complete their respective life-cycles.

Threatened species habitat opportunity was of a better relative complexity to support a range of vertebrate fauna and vascular plants in the APZ, particularly in the northern areas. Southern APZ areas are also diverse in terms of vascular plant richness, but as a ski slope it lacks vegetation structure and stratum. In addition, most rocks have been removed over the years to make the slope safe for guests and slope grooming operations. In the southern APZ area, most habitat complexity is found in remnant tree stands. These sites are not of the highest condition, but tree structure, canopy, occasional shrubs and rocks can be found, particularly in the larger stands. In contrast to southern APZ areas on the ski slope, the northern and western APZ area has a higher habitat complexity, but much of this has been diminished since the January 2020 bushfire. Therefore, habitat opportunity needs to be considered in the short and long term – how it exists at the time of this assessment, and the projected habitat quality that may return and provide opportunity to the same (and other) species that it did prior to the fire.

If any of the trees and shrubs are to be removed in the future, or not permitted to regenerate to maintain inner and outer APZ thresholds, then obviously habitat opportunity will be reduced. The state of the environment when this assessment was undertaken was also in a critical phase of recovery, with several introduced species starting to proliferate including those with a relatively early

flowering period. This means that these species will have an advantage over native species to colonise new areas, or at least contribute more seed to the seed bank and germinate when other opportunities become available. The survey data also provides the recovery status of the environment approximately 10 months after the bushfire. This challenged the ability to detect as many plant species as possible and confidently identify flora to species level at a time when most grasses, forbs and emerging shrubs were not budding or in flower. Unfortunately, this challenge also extends to threatened flora. There remains the possibility that some of the flora in Table 1 may have been present but overlooked due to concealment amongst other plants or at an inconspicuous stage of growth. As a simple comparison between the flora identified by Ecology Australia in 2003 and presented in the ENFAC report (2009), 174 vascular plants were recorded of which 12 were introduced. That inventory was taken across the entire resort area and included more diverse community variation than that assessed for this assessment, notwithstanding the impact of the bushfire. However, there are some presentation and interpretation issues amongst the data in the report as ENFAC also identified 35 weed species. This contrasts with the 40 exotic species identified in this report, many of which were not identified by Ecology Australia nor reported by ENFAC. Accepting that there will be some identification differences and errors amongst all botanists and ecologists, and some nomenclature changes over time between surveys, concerning is the diversity of the weed species present in the area. Using the list of exotic and noxious weeds recorded by ENFAC in 2009 before the fire (p. 37 ENFAC 2009), and those identified in this report (Appendix 2), the potential incursion and abundance of weeds over the warmer months is great. All introduced species compete with the integrity of native species. However, some species, often those described and formally listed as noxious, tend to be more concerning. Table 3 lists those species that may pose a risk of increasing their current distributional limit in the resort area and take advantage of bare areas yet to be colonised by native species. The list is taken from noxious weeds listed by ENFAC in 2009 and those identified in this report as identified on the 15th October 2009. These species should be the subject of priority weed control although a broader discussion should be made with NPWS to account for any other potential noxious weeds in the area including appropriate control methods.

Table 2: Noxious weeds identified in the Selwyn Snow Resort area.

Scientific Name	Common Name
<i>Perennial grasses</i>	<i>(although some may not be practical control)</i>
<i>Dactylis glomerata</i>	Cock's Foot
<i>Holcus lanatus</i>	York-shire Fog
<i>Phleum pratense</i>	Timothy Grass
<i>Achillea millefolium</i>	Milfoil
<i>Cirsium vulgare</i>	Scotch Thistle
<i>Collomia grandiflora</i>	Great Collomia
<i>Echium vulgare</i>	Viper's Bugloss
<i>Echium plantagineum</i>	Paterson's Curse
<i>Hypericum perforatum</i>	St. John's Wort
<i>Leucanthemum x superbum</i>	Shasta Daisy
<i>Onopordum acanthium</i>	Scotch Thistle
<i>Rubus</i> sp.	Blackberry
<i>Salix cinerea</i>	Black Willow

To appraise the impacts of the proposed redevelopment on the species listed in Table 1, and the field work that attempted to search for those species and assess habitat potential, each species has been

assessed in the context of the existing environment with consideration for how habitat will change overtime as vegetation regrowth progresses.

Table 3 below provides an assessment of those threatened species and threatened ecological communities either known or possibly occurring in and adjacent to the proposed redevelopment buildings, structures and APZ, **and** whether the proposed redevelopment and its use has the **potential to adversely affect** those species and threatened ecological communities. Those species identified as ‘occurring’ **or** having a ‘high likelihood of occurrence’, **and** where the potential to adversely affect is considered ‘high’, would be subjected to a ‘Test of Significance’ under the *BC Act* and/or ‘Significant Impact Criteria’ under the *EPBC Act* respectively. Consideration of the ‘potential to adversely affect’ species and threatened ecological communities is commensurate with the extent and type of disturbance activities prescribed and anticipated with the redevelopment. However, it does not attempt to explicitly interpret any vegetation clearing associated with northern and western areas of the APZ as the degree of impact would depend upon the amount and type of vegetation to be cleared. In the most simple of responses, the greater the vegetation removal of trees and/or shrubs, the lesser the habitat complexity and in turn, the less habitat available to common and threatened species, whether that be for foraging, roosting, refuge or nesting sites. However, a cursory comment has been provided to indicate a general impact description upon each species in the northern and western APZ based on the species’ general occupancy within the structure of their preferred habitat.

Table 3: Evaluation of threatened species and threatened ecological communities as potential candidates for assessment of the ‘Test of Significance’ under the BC Act and ‘Significance Assessment Criteria’ under the EPBC Act.

Codes:

V – Vulnerable, E – Endangered, CE – Critically Endangered, EEC – Endangered Ecological Community.

Scientific Name/Common Name/Conservation Status	Previously recorded in survey area	Recorded during field surveys	Potential to be impacted by the proposed redevelopment	Justification
FLORA				
<i>Prasophyllum retroflexum</i> <i>Kiandra Leek Orchid</i> V – BC Act V – EPBC Act	No	No	Low	Habitat elements present in the area, but not fully commensurate with environments where the species occurs in other areas in KNP. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
<i>Pterostylis foliata</i> <i>Slender Greenhouse</i> V – BC Act	No	No	Low	Arguably a forest species and at lower elevations. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
<i>Discaria nitida</i> <i>Leafy Anchor Plant</i> V – BC Act	No	No	Low	A strong fidelity to rocky creek lines or rocky areas not too distant from natural water bodies. Habitat not consistent within the northern parts of Selwyn Snowy Resort. An easy plant to identify, although slow growing. The species was not present on sites proposed for the buildings and embankment, nor present in the southern APZ. If it were present in the northern APZ, then it could be impacted by clearing to

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				meet APZ thresholds. However, very unlikely to be present.
<i>Thesium australe</i> Austral Toadflax V – BC Act V – EPBC Act	No	No	Low	A greater appreciation of this species' distribution as a result of more surveys associated with the Snowy Hydro 2 project. A strong association with Kangaroo Grass – <i>Themeda australis</i> . Not detected and unlikely to be present. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retention as it is not part of the targeted fuel load.
<i>Pimelea bracteata</i> Rice Flower CE – BC Act	No	No	Low	A species that grows on the fringe of wetlands and waterways, but habitat not present within the survey area except for the artificial quarry dam. The closest possible habitat is further to the north of the APZ along a mapped bog area. This site was severely impacted by the wildfire and inspected, but no plants noted. In summary the species is unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is likely to be impacted by any shrub clearing as it is of height that could be targeted to meet APZ thresholds. But given the APZ occurs in dry vegetation types, the species is very unlikely to be present.
<i>Calotis glandulosa</i> Mauve Burr-daisy V - BC Act V - EPBC Act	No	No	Low	A possible occurring species even though no plants were detected during this survey or surveys undertaken by Ecology Australia (2003) and ENFAC (2009). However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retention as it is not part of the targeted fuel load.
<i>Diurus ochroma</i> Pale Gold Moths E – BC Act V – EPBC Act	No	No	Low	Some habitat elements present in the area, but not fully commensurate with environments where the species occurs in other areas in KNP. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retention as it is not part of the targeted fuel load.
<i>Leucochrysum albicans</i> var. <i>tricolor</i> Hoary Sunray V – EPBC Act	No	No	Low	Generally occurs at lower elevations than Selwyn, but tends to occur in unexpected disturbed sites. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retention as it is not part of the targeted fuel load.
<i>Pterostylis oreophila</i> Blue-tongued Greenhood CE – BC Act CE – EPBC Act	No	No	Low	A species with a fidelity to sub-alpine watercourses under thickets of Mountain Tea-tree. An unlikely candidate in the survey area, but possibly occurring in other areas of the resort, particularly further to the south along Clear Creek. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retention as it is not part of the targeted fuel load.
<i>Rutidosia leirolepis</i> Monaro Golden Daisy V – BC Act V – EPBC Act	No	No	Low	A lower elevation growing species compared to environments around Selwyn. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance

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				before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retention as it is not part of the targeted fuel load.
<i>Calotis pubescens</i> Max Mueller's Burr-daisy E – BC Act	No	No	Low	Tends to occur in natural treeless sub-alpine treeless plains compared to the environment that has been created around Selwyn. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retention as it is not part of the targeted fuel load.
FAUNA				
<i>Litoria verreauxii alpina</i> Alpine Tree Frog E – BC Act V – EPBC Act	No	No	Moderate	Although not subject to any direct surveys, and arguably any attempts to survey for this species may be considered too early in the season to maximise detection. However, the quarry dam was the only site in the survey area where there was a water body to support tadpoles. However, there was a lack of other supporting vegetation around the perimeter. That said, if animals were present and found enough niche requirements within the confines of the dam, then some impacts could be considered if the current full-dam level were to increase by another vertical 1 m. If that were to occur, the quarry basin would still provide the same attributes of grasses, forbs and rock refuge that currently exists, except the amount of area currently available would be reduced.
<i>Cyclodomorphus praeltus</i> Alpine She-oak Skink E – BC Act E – EPBC Act	No	No	Moderate	The species has specific habitat requirements preferring treeless or very lightly treed areas that contain tussock grasses, low heath or combination of both (DPIE 2020o). Within this habitat the species shelters beneath litter, rocks, logs and other ground debris, and has been observed basking in tussocks (pers. obs – Rennix Gap). Broad habitat type includes alpine to sub-alpine grasslands in flat to gently sloping areas (DPIE 2020o). Little optimum habitat currently exists since the 2020 bushfire, although other components such as rocks are not prolific in the survey area. There is no habitat available for this species at any of the proposed buildings and the quarry dam embankment. If habitat were present in the southern areas of the APZ, then the species survived winter recreation and slope grooming activities before the fire. If the species were present on the northern areas of the APZ, then they are unlikely to be affected by the removal of any trees or the thinning of shrubs, particularly if grass tussocks continue to grow and more tree and shrub debris is left on the ground as refuge sites. The current environment in the northern APZ area lacks rocks and ground debris. Future regrowth of shrub species may actually detract from this area being candidate habitat for Alpine She-oak Skink. The probability for this species being present in and adjacent to the redevelopment is low and therefore impacts are also low. However, without absolute knowledge of species being present or absent, a more conservative Moderate impact is declared based on the types of activities associated with the redevelopment.
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo BC – V	No	No	Low	The chances of this species being present either flying over the canopy or feeding on seed on unburnt trees is high, at least before the bushfire. Feeding opportunities have been diminished although Gang-gang Cockatoo are known to feed on grasses, graminoids and forbs on the ground. Perhaps more critical within the Selwyn area is the availability of tree hollows, an attribute that is limiting the conservation status for this species. Due to the fire many of the tree hollows have been lost, although some others have been created but in smaller trees and with less hollow sites that may not meet the bird's requirements of 10 cm diameter or larger and at least 9 m above the ground. The vegetation type and exposed area on a ridge top and adjacent spur is not optimum for this species. The lack of records in the resort area for such

				an easily identified bird may reflect the lack of critical breeding opportunities in the area. In summary, some nesting opportunities still exist, feeding opportunities in the canopy have been lost, and there is no immediate impact upon this species by the proposed activities associated with the redevelopment. If some of the larger trees in the northern and western areas of the APZ were to be felled, then there could be a minor impact of breeding opportunities for this species, but it would not be deemed significant for this area.
<i>Pachycephala olivaceae</i> Olive Whistler V – BC Act	No	No	Low	Although a sub-alpine resident or seasonal/altitudinal migrant, the species does prefer a thick and contiguous understorey along creek lines or in wet sclerophyll forests. Much of this habitat has been lost due to the intensity of the bushfire. However, optimum habitat is not present and unlikely to have been present before the wildfire. No impact associated with the proposed buildings and embankment upgrade, and a low impact should any shrubs be removed from the northern APZ.
<i>Petroica phoenicea</i> Flame Robin V – BC Act	Yes	No	Moderate	Only one record exists for this species in the survey area, but it would be expected that historically more species would have been present across the ski slope as the resort and surrounding area provides optimum summer habitat. However, since the 2020 bushfire, foraging and nesting habitat has been either diminished or entirely lost. The critical components of tree and shrub canopy will regenerate in woodland areas in the future to a level that will provide breeding and nesting opportunities for this species. However, at the time of this survey, critical habitat components were absent and will take some time to return. Birds may still be present in the resort and perch from trees to sally for insects, or from other structures. However, whether there are enough insects in the area during the non-winter months is unknown. However, the suite of bird species in Appendix 2 would suggest omnivores, insectivores and granivores are finding enough food 10 months after the fire, though the relative abundance and relative densities for each of these species is unknown. The species is unlikely to be impacted by any of the activities associated with the proposed development, with only local impacts should trees and shrubs in the northern APZ area be removed in the future.
<i>Cercartetus nanus</i> Eastern Pygmy-possum V – BC Act	No	No	Low	No Eastern Pygmy-possum have been identified in the Selwyn area, although new records have been established within 5 km to the north-east as part of Snowy Hydro survey assessments. However, these sites are at lower altitudes to Selwyn. Eastern Pygmy-possum was listed by the author in Table 1 as the species has been recorded above 1400 m in a few other areas in KNP, and most records until recently were incidental. Areas above 1500 m elevation appear to be too high for the species to survive, though the environment in the northern APZ area before the bushfire did contain elements consistent for this species including tree hollows at various heights, ground debris including logs, and a contiguous shrub cover. If Eastern Pygmy-possum were in these environments before the bushfire, there is little habitat available that could support this species in the near future. Vegetation in sub-alpine areas is slow to recover, particularly given the extent and intensity of the January 2020 fire.
<i>Mastacomys fuscus</i> Broad-toothed Rat V – BC Act V – EPBC Act	Yes (the species was recorded outside of the western edge of the APZ area, but considered close enough as the vegetation was the same type)	No (but fresh scats were identified about 70 m south of the existing pump house along Clear Creek)	Moderate	There is no effective habitat on any of the proposed development sites and the current and projected height of ground vegetation in the southern areas of the APZ would not be adequate. However, vegetation around the northern and western areas of the APZ could have provided sub-optimum habitat for this species that prefers wet grassland, wet heath and bog communities or a complex of these types. Dry shrub understorey is not optimum but could be used to bridge areas. Perhaps more important are thick <i>Poa</i> tussocks from which the animal makes runways and tunnels from where it feeds on grasses and sedges. The northern and western APZ area has been severely fire affected, and currently there is no effective

				contiguous grass cover, shrubs are absent, and the degree of burnt trunks and absence of a tree canopy indicates a high intensity fire. It is highly unlikely that Broad-toothed Rat are currently present in this area and it will take some time for any species to recolonise. For this to happen, optimum habitat will have to regenerate and there needs to be animals in the area that survived the fire. Relatively fresh scats were identified along Clear Creek. This is encouraging as the grass growth in this area was good although not thick or contiguous enough to provide cover for transitory animals away from the creek line. At this point in time it is unlikely that Broad-toothed Rat are present in the survey area and nor would they be impacted by the proposed redevelopment. A reassessment would be required in the future if regenerated shrubs or seedling regrowth needed to be removed to meet APZ thresholds. It is possible that no significant impact could occur if a contiguous tussock ground cover was present and left intact. Detection of this species is relatively easy using the presence of scats.
<i>Pseudomys fumeus</i> Smoky Mouse CE – BC Act E – EPBC Act	No	No	Low	Unlike Broad-toothed Rat, Smoky Mouse require a greater habitat complexity than thick contiguous Poa tussocks. Records for this species have included high sub-alpine areas in KNP, although most records are from lower elevations including a new suite of records about 5 km to the north-west. Given the loss of ground and shrub vegetation including most ground debris and logs, it is highly unlikely that Smoky Mouse would be present in the northern and western APZ area. Whether habitat opportunity changes in the future will depend upon post-fire regeneration, the accumulation of ground debris including logs and the survival or recolonisation of a local population. At this point in time there is a low risk of impacting this species by the proposed activities associated with the redevelopment. However, if there is a requirement in the future to remove vegetation to meet APZ thresholds, then this species will need to be re-evaluated with the likely requirement to undertake trapping to determine whether this species is present.
Microbats (V – BC Act) <ul style="list-style-type: none"> • <i>Falsistrellus tasmaniensis</i> Eastern False Pipistrelle • <i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat 	No	No	Moderate	Although no records in the survey area, the chances of species of microbat being present in the Selwyn area is high, even for short periods of time during the non-winter months. The chances of roosting in some of the larger trees with small hollows, fissures and larger slabs of decorticating bark is also high – at least before the January 2020 bushfire changed the habitat. Suitable hollows are still present but the loss of foliage and other vegetation that supported various insect species including moths has been lost – the degree of impact can only be postulated. By the development of the Guest Facilities, ROC and increased size of the embankment there will be no impact upon any microbat species. There is no habitat value within the southern APZ except tree stands scattered across the slope. The trees in the northern and western APZ are still likely to provide some roosting opportunities, but persistence in the immediate area will also depend upon prey (e.g. insects and other invertebrates). Habitat opportunities will improve over time as the vegetation regenerates, although tree canopy to match the pre-fire status will take a long time as this will only take place by the maturing coppice shoots currently sprouting at the base of most trees. If trees are to be removed to meet APZ thresholds, then a greater level of assessment would be required to determine which species are present and which trees would be providing roosting or nesting sites at that point in time. Furthermore, specialised detection methods would be required to identify microbats including harp traps and ultrasonic equipment.
Threatened Ecological Community				
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East	No	No	Low	No Montane Peatland is present within the survey area. The closest recorded community is to the north of the northern APZ area. The current outer APZ calculations identify the zone to be within the snow

<p>Corner, South Eastern Highlands and Australian Alps bioregions</p> <p>EEC – BC Act E – EPBC Act</p>				<p>gum woodland. There are other patches of Montane Peatland within the resort, but these are mostly scattered to the south and to the north-east. Where adjacent Montane Peatland community to the APZ is present, it would only be impacted if the adjacent APZ were to include future clearing. Surface and sub-surface drainage is an integral process to the maintenance of Montane Peatland communities. Any changes to water flow by removing upslope vegetation that could increase flow rates away from the site or increase evaporation rates by the loss of canopy species, would be detrimental. The challenges faced by fire-affected Montane Peatlands is significant. Many of the peatlands observed by the author as part of a Peatland Monitoring project in KNP that includes many sites along the Snowy Mountains Hwy and Cabramurra Rd., shows a dramatic loss of peatland species including the constituent Sphagnum component. Recovery of these ecosystems will take years to see the return of previous species, but in some cases, where the peat has been destroyed by fire, the main process driver of this ecosystem has been lost. If upslope vegetation from the adjacent Montane Peatlands is to be removed as part of any future APZ commitments, then a reappraisal of these communities may need made in the context of how much vegetation and the location of that vegetation in relation to the peatland. However, the sites for the proposed Guest Facilities, ROC and enlarged quarry embankment will not have any impact upon Montane Peatlands adjacent to the survey area.</p>
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In summary, no adverse impacts are anticipated upon threatened flora and fauna as a result of the proposal to build Guest Facilities and Resort Operation Centre on the previously disturbed sites that contained the former resort buildings prior to the January 2020 bushfire. The proposal to increase the embankment height at the quarry dam and subsequent water volume will also not have any adverse impacts as the quarry is essentially a disturbed area, and habitat will remain within the enclosure, although the amount of area will be reduced when the full-dam level is periodically reached. APZ areas to the south of the Guest Facilities and ROC are mostly a managed ski slope where the height of the vegetation is maintained to a low profile for skier safety and snow grooming operations. The plant diversity in this area is high with a strong representation of native species, although habitat opportunity is low due to that lack of vegetation structure and stratum and other features such as rocks and boulder outcrops. Vegetation has recovered relatively well since the bushfire.

APZ areas to the north and west of the Guest Facilities and ROC had a greater habitat complexity before the bushfire as provided by trees and shrub layer. The bushfire has removed most tree canopy and nearly all shrubs. Ground cover is patchy with some areas recovering well like southern APZ areas, while other areas are still devoid of any vegetation. The presence of numerous noxious weeds in this area as identified by ENFAC (2009) before the fire, and those identified here approximately 10 months after, pose an ongoing risk to the recover of native vegetation. Habitat potential within the northern and western APZ areas has been diminished due to the bushfire, although this will be reinstated overtime as the vegetation regenerates and more ground debris accumulates. The severity of the fire has removed most logs and branches that are important habitat components for ground fauna, but this will also be reinstated when some of the standing tree material including trunks and branches collapse.

While burnt vegetation is considered aesthetically displeasing, the opportunity that fire can have by creating or enhancing hollows needs to be recognised. There will be different opportunities to different species in the short and long term of tree and community regeneration. Unless unsafe to staff and guests, or where slope operations are impeded, burnt trees and felled material should be left as part of fauna habitat, including habitat opportunities for non-threatened species.

6 CONCLUSIONS

The building of new Guest Facilities and Resort Operation Centre will not have any adverse impact upon threatened species or threatened ecological communities as it is sited over the same building envelope and precinct as existed before the January 2020 bushfire. The quarry dam augmentation will not have any impact upon threatened species or threatened ecological communities at the embankment wall, and the subsequent increased dam potential is not anticipated to have any adverse impacts upon threatened species as area with the dam will still be available (should threatened species be present). The APZ area to the south will continue to be managed as a ski slope as it existed before the bushfire, and therefore will pose no risk to threatened species and threatened ecological communities. The post-fire recovery of the APZ area to the north and west will take many years to attain the same habitat opportunities to that which existed prior to the bushfire. However, prevention or subsequent removal of any tree and shrub regrowth will have an impact upon habitat potential, the degree to which is uncertain without specific vegetation targets. Future targets or work may have to be assessed in the context of the vegetation to be removed at that point in time and the species present or likely to be present at that point in time reappraised.

At the time this assessment was undertaken approximately 10 months after the bushfire, no threatened flora was detected and habitat potential for most threatened species was absent or greatly diminished. The proposed redevelopment and associated activities pose no risk to threatened species or threatened ecological communities given the information provided and, in the context prescribed, discussed in this report. Therefore, no 'Test of Significance' under the BC Act or the Commonwealth's 'Significant Impact Criteria' under the *EPBC Act* was applied. However, future vegetation clearing could require specialised fauna survey methods to be employed and respective significant impact criteria to be tested against possible candidate species and communities.

REFERENCES

- DoEE (2020). Protected Matters Search Tool (PMST) for MNES search undertaken 14th October 2020 (new report generated on 19th October 2020) <http://www.environment.gov.au/epbc/protected-matters-search-tool>
- DPIE (2020a). *BioNet Atlas of NSW Wildlife*. Area searched, viewed and species filtered on 14th October 2020. <http://bionet.nsw.gov.au/>
- DPIE (2020b). *BioNet Vegetation Classification*. Department of Planning, Infrastructure and Environment. <http://environment.nsw.gov.au/NSWVCA20PRapp/search/pctsearch.aspx>
- DPIE (2020c). Kiandra Leek Orchid – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020d). Slender Greenhood Orchid – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020e). Leafy Anchor Plant – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020f). Austral Toadflax – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020g). NSW Threatened Species Scientific Committee – Final Determination. *Pimelea bracteata*, a shrub – critically endangered species listing
- DPIE (2020h). Mauve Burr-daisy – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020i). Pale Gold Moths – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020j). Hoary Sunray – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020k). Blue-tongued Greenhood – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020l). Monaro Golden Daisy – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020m). Max Mueller’s Burr-daisy – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020n). Alpine Tree Frog – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/
- DPIE (2020o). Alpine She-oak Skink – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

DPIE (2020p). Gang-gang Cockatoo – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

DPIE (2020q). Oliver Whistler – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

DPIE (2020r). Flame Robin – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

DPIE (2020s). Eastern Pygmy-possum – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

DPIE (2020t). Broad-toothed Rat – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

DPIE (2020u). Smoky Mouse – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

DPIE (2020v). Eastern False Pipistrelle – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

DPIE (2020w). Large Bent-winged Bat – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

DPIE (2020x). Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions – profile: threatened species database. NSW Department of Planning Infrastructure and Environment. www.environment.nsw.gov.au/threatenedSpeciesApp/

Ecology Australia (2003). Kosciuszko Resorts Vegetation Assessment. Vegetation mapping and report for the NSW Department of Planning.

ENFAC (2009). Natural and Cultural Inventory of Selwyn Snowfields Lease Area. Report to Department of Environment and Climate Change, Sydney, NSW.

Mitchell, P. (2008). *Mitchell Landscapes - Landscape dataset and descriptions (V.3)*. Revised by Ecological Australia for Office of Environment and Heritage).

APPENDIX 1:

EPBC Act Protected Matters Report

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.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 19/10/20 17:58:05

[Summary](#)

[Details](#)

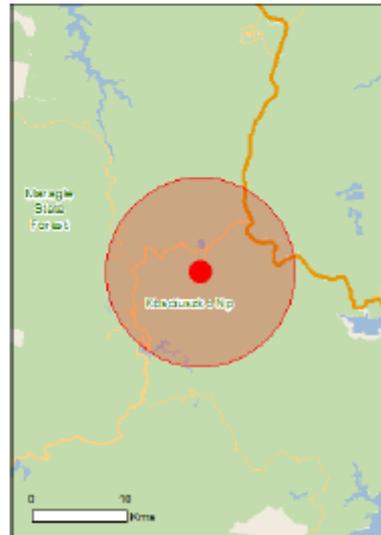
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

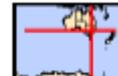
[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)
Buffer: 10.0Km



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](#).

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	34
Listed Migratory Species:	11

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. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

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.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	1
Invasive Species:	30
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties [\[Resource Information \]](#)

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

Wetlands of International Importance (Ramsar) [\[Resource Information \]](#)

Name	Proximity
Banrock station wetland complex	700 - 800km upstream
Hattah-kulkyne lakes	500 - 800km upstream
Riverland	700 - 800km upstream
The coorong, and lakes alexandrina and albert wetland	700 - 800km upstream

Listed 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
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community known to occur within area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Fish		
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence area
Maccullochella peelii Murray Cod [88633]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica Macquarie Perch [88632]	Endangered	Species or species habitat may occur within area
Frogs		
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat likely to occur within area
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area
Litoria spenceri Spotted Tree Frog [25959]	Endangered	Species or species habitat likely to occur within area
Litoria verreauxii_alpina Alpine Tree Frog, Verreaux's Alpine Tree Frog [88689]	Vulnerable	Species or species habitat known to occur within area
Pseudophryne corroboree Southern Corroboree Frog [1915]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Burramys parvus Mountain Pygmy-possum [267]	Endangered	Species or species habitat known 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 likely to occur within area
Mastacomys fuscus_mordicus Broad-toothed Rat (mainland), Tooarrana [87817]	Vulnerable	Species or species habitat known to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [188]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Plants		
Calotis glandulosa Mauve Burr-daisy [7842]	Vulnerable	Species or species habitat may occur within area
Colobanthus curtisiae Curtis' Colobanth [23981]	Vulnerable	Species or species habitat likely to occur within area
Diuris ochroma Pale Golden Moths [84585]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Prasophyllum bagoense Bago Leek-orchid [84278]	Critically Endangered	Species or species habitat may occur within area
Pterostylis oreophila Blue-tongued Orchid, Kiandra Greenhood [22903]	Critically Endangered	Species or species habitat likely to occur within area
Rutidosia leiolepis Monaro Golden Daisy [21490]	Vulnerable	Species or species habitat likely to occur within area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
Reptiles		
Cyclodomorphus praealtus Alpine She-oak Skink [84721]	Endangered	Species or species habitat may occur within area
Liopholis guthega Guthega Skink [83079]	Endangered	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [882]	Vulnerable	Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [844]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [812]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [858]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [858]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		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]	Vulnerable	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [812]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Kosciuszko	NSW

Regional Forest Agreements	[Resource Information]
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Note that all areas with completed RFAs have been included.

Name	State
Southern RFA	New South Wales

Invasive Species	[Resource Information]
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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 Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species

Name	Status	Type of Presence
Passer domesticus House Sparrow [405]		habitat likely to occur within area Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [8]		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		

Name	Status	Type of Presence
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to 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 reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-35.90748 148.44945

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Department of Land and Resource Management, Northern Territory](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- [Natural history museums of Australia](#)
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- [Australian Tropical Herbarium, Cairns](#)
- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

[Commonwealth of Australia](#)
Department of Agriculture, Water and the Environment
GPO Box 858
Canberra City ACT 2601 Australia
+61 2 6274 1111

APPENDIX 2:

Flora Survey – Species List and Relative Abundance Weighting

Vascular plants recorded as part of the broader APZ for the proposed new Guest Facilities and Resort Operation Centre, as well as a stand-alone species list for the proposed height increase of the embankment in front of the quarry to raise the capacity of the dam. No flora species list is presented specifically for the building footprint of the Guest Facilities and Resort Operation Centre as the proposed sites are mostly devoid of vegetation or only contain exotic ground flora commensurate with the exotic grasses and forbs present surrounding the original buildings.

Data was collected on 15th October 2020. Scientific nomenclature follows that prescribed in the NSW PlantNet Database managed by the Royal Botanical Gardens.

Relative Abundance – code and description:

- 1 – rarely observed within the survey area. May be numerous but only in a very small area or isolated clump.
- 2 – occasionally observed in the survey area. May include scattered clumps.
- 3 – frequently observed in the survey area. May be scattered as isolated plants or clumps but expect to observe in different areas along the alignment.
- 4 – abundant. Frequently observed in the survey area without traversing too far. A dominant plant in terms of frequency or vertical projection and characterises the relevant community composition and structure.

Scientific Name	Common Name	Cover Abundance APZ	Cover Abundance Quarry Dam
(FERNS)			
DRYOPTERIDACEAE			
<i>Polystichum proliferum</i>	Broad Shield Fern	1	1
(MONOCOTYLEDONS)			
CYPERACEAE			
<i>Carex appressa</i>	Saw Sedge	2	
<i>Carex breviculmis.</i>	A Sedge	3	1
? <i>Isolepis</i> sp.	A Club Sedge	2	
JUNCACEAE			
<i>Luzula novae-cambriae</i>	Luzula	3	1
* <i>Juncus effusus</i>	Soft Rush	1	
AMARYLLIDACEAE			
?* <i>Narcissus</i> sp.	Daffodil	1	
PHORMIACEAE			
<i>Dianella tasmanica</i>	Tasman Flax-lily	2	
LOMANDRACEAE			
<i>Lomandra longifolia</i>	Spiny Headed Mat-rush	2	
POACEAE			
<i>Agrostis</i> sp.	A Native Bent Grass	2	
? <i>Deyeuxia</i> sp.	A Native Bent Grass	2	
<i>Poa constiniana</i>	Bog Snow Grass	1	
<i>Poa phillipsiana</i>	Purple Snow Tussock	1	

<i>Poa sieberiana</i> var. <i>sieberiana</i>	Snow Grass	4	2
? <i>Rytidosperma</i> sp.	A Wallaby Grass	2	
* <i>Agrostis capillaris</i>	Brown-top Bent	3	2
* <i>Aira</i> sp.	A Hair Grass	2	
* <i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	1	
* <i>Dactylis glomerata</i>	Cock's Foot	2	2
* <i>Festuca arundinaceae</i>	Tall Fescue	2	
* <i>Festuca nigrescens</i>	Chewing's Fescue	1	
* <i>Festuca rubra</i>	Red Fescue	2	2
* <i>Holcus lanatus</i>	Yorkshire Fog	1	2
* <i>Phleum pratense</i>	Timothy Grass	1	1
* <i>Poa annua</i>	Winter Grass	2	
* <i>Poa pratensis</i>	Kentucky Blue Grass	2	
Unidentified grass 1 (no inflorescence)		2	
Unidentified grass 2 (no inflorescence)		1	
Unidentified grass 3 (annual)		1	
Unidentified grass 4 (annual)		1	
(DICOTYLEDONS)			
APIACEAE			
<i>Aciphylla simplicifolia</i>	Mountain Aciphylla	1	
<i>Oreomyrrhis argentea</i>	Silvery Carraway	2	
ASTERACEAE			
<i>Brachyscome decipiens</i>	Field Daisy	2	
<i>Brachyscome spathulata</i>	Spoon Daisy	1	
<i>Brachyscome</i> sp.	A Daisy	1	
<i>Cassinia</i> ? <i>monticola</i>	Mountain Cassinia	1	
<i>Celmisia</i> sp.	Silver Snow Daisy	2	
<i>Coronidium scorpioides</i>	Button Everlasting	3	
<i>Craspedia</i> ? <i>coolaminica</i> (linear basal leaves)	A Billy Button	1	
<i>Craspedia</i> ? <i>jamesii</i>	A Billy Button	2	
<i>Craspedia</i> sp. (large hairy leaved)	A Billy Button	2	
? <i>Erigeron bellidioides</i>	A Native Feabane	1	
<i>Euchiton</i> sp.	A Cudweed	2	
<i>Leptorhynchus squamatus</i> ssp. <i>alpinus</i>	Scaly Buttons	2	
<i>Olearia erubescens</i>	Pink-tip Daisy Bush	2	
<i>Olearia phlogopappa</i> ssp. ? <i>serrata</i>	Dusty Daisy Bush	1	
<i>Cassinia monticola</i>	Mountain Cassinia	1	
<i>Picris angustifolia</i> ssp. <i>merxmuelleri</i>	Native Picris	1	
<i>Podolepis laciniata</i>	Mountain Lettuce	1	
<i>Rhodanthe anthemoides</i>	Chamomile Sunray	1	
<i>Senecio gunnii</i>	A Montain Grounsel	2	1
* <i>Achillea millefolium</i>	Milfoil	1	
* <i>Cirsium vulgare</i>	Spear Thistle	2	
* <i>Crepis</i> ? <i>foetida</i>	Stinking Crepis	1	2
* <i>Hypochaeris glabra</i>	Smooth Cat's Ear	1	
* <i>Hypochaeris radicata</i>	Cat's Ear	3	3
* <i>Leucanthemum x superbum</i>	Shasta Daisy	2	
* <i>Taraxacum officinale</i>	Dandelion	2	2
* <i>Tragopogon dubius</i>	Goatsbeard	1	

BORAGINACEAE			
<i>*Myosotis discolor</i>	Forget-me-not	1	
BRASSICACEAE			
<i>Cardamine</i> sp.	A Bitter-cress	1	
<i>*Erophila verna</i>	Whitlow Grass	1	
CAMPANULACEAE			
<i>Lobelia pedunculata</i>	Trailing Pratia	2	
<i>Wahlenbergia</i> sp.	A Bluebell	1	
CARYOPHYLLACEAE			
<i>Scleranthus biflorus</i>	Two-flowered Knawel	2	
<i>Scleranthus? fasciculatus</i>	Knawel	1	
<i>Stellaria pungens</i>	Prickly Starwort	3	2
<i>*Cerastium</i> sp.	A Chickweed	1	2
<i>*Spergularia rubra</i>	Sandspurry	1	
ELATINACEAE			
? <i>Elatine gratioides</i>	Water Wort		2
EUPHORBIACEAE			
<i>Poranthera microphylla</i>	Small Poranthera	1	
FABACEAE			
<i>Bossiaea foliosa</i>	Leafy Bossiaea	1	
<i>Daviesia ulicifolia</i>	Gorse Bitter Pea	2	
<i>Hovea montana</i> or <i>H asperifolia</i> (just emerging)	Hovea	2	
? <i>Oxylobium ellipticum</i> (possibly <i>Podolobium alpestre</i> – material just emerging)	Bush Pea	2	2
<i>*Trifolium arvense</i>	Haresfoot Clover	1	
<i>*Trifolium ?campestre</i>	Hop Clover	2	
<i>*Trifolium ?dubium</i>	Yellow Suckling Clover	2	
<i>*Trifolium fragiferum</i>	Strawberry Clover	1	
<i>*Trifolium pratense</i>	Red Clover	1	1
<i>*Trifolium repens</i>	White Clover	3	2
<i>*Trifolium ?subterraneum</i>	Subterranean Clover	2	
GERANIACEAE			
<i>Geranium ?antrorsum</i>	Common Crane's Bill	2	
<i>Geranium ?solanderi</i> var. <i>solanderi</i>	Cut-leaf Crane's Bill	2	2
<i>*Erodium cicutarium</i>	Common Stork's Bill	1	
GOODENICACEAE			
<i>Goodenia hederaceae</i> ssp. <i>alpestris</i>	Mountain Ivy Goodenia	2	
<i>Scaevola hookeri</i>	Mountain Mat-flower	1	
HALORAGACEAE			
<i>Gonocarpus ?tetragynus</i> (Possibly <i>G. montanus</i>)	A Raspwort	2	
HYPERICACEAE			
<i>*Hypericum peforatum</i>	St. John's Wort	2	2
MYRTACEAE			
<i>Baeckea gunniana</i>	Alpine Baeckea	1	
<i>Eucalyptus pauciflora</i> ssp. <i>niphophila</i> (assumed to be <i>E. p. niphophila</i> and not <i>E. p. debeuzevillei</i>)	Snow Gum	3	1
ONAGRACEAE			
<i>Epilobium billardierianum</i> ssp. <i>hygrophilum</i>	Hairy Willow Herb	1	2
OXALIDACEAE			
<i>Oxalis ?perennans</i>	Oxalis	1	

* <i>Oxalis corniculata</i>	Oxalis	1	
PLANTAGINACEAE			
* <i>Plantago lanceolata</i>	Lamb's Tongues	2	
* <i>Veronica anagallis-aquatica</i>	Blue Water Speedwell	1	
POLYGONACEAE			
* <i>Acetosella vulgaris</i>	Sheep Sorrell	4	4
* <i>Polygonum aviculare</i>	Wireweed	1	
RANUNCULACEAE			
<i>Ranunculus graniticola</i>	Granite Buttercup	2	
<i>Ranunculus</i> sp.	Buttercup	1	
ROSACEAE			
<i>Acaena novae-zelandiae</i>	Bidgeee-widgee	2	2
<i>Acaena</i> sp.	A Sheep's Burr	2	
<i>Geum urbanum</i>	Herb Bennett	1	
RUBIACEAE			
<i>Asperula gunnii</i>	Mountain Woodruff	2	
<i>Asperula scoparia</i>	Prickly Woodruff	2	
STYLIDIACEAE			
<i>Stylidium ?montanum</i>	Alpine Triggerplant	2	
THYMELEACEAE			
<i>Pimelea biflora</i>	<i>Matted Rice Flower</i>	1	
<i>Pimelea linifolia</i>	Poison Rice Flower	3	
<i>Pimelea ?curviflora</i>	Poison Rice Flower	1	
VIOLACEAE			
<i>Viola betonicifolia</i>	Showy Violet	1	
* <i>Viola arvensis</i>	Field Pansy	3	
WINTERACEAE			
<i>Tasmannia xerophila</i> ssp. <i>xerophila</i>	Pepper Bush	2	
Unidentified forb 1		2	
Unidentified forb 2 (possibly an Asteraceae)		2	1
Unidentified forb 3 (possibly exotic – close to road)		1	
Unidentified forb 4		1	
Unidentified forb 5 (possibly exotic – highly disturbed area)		2	1
Unidentified herb (lily-like).		1	

*denotes exotic species

Site Summary	Total Native	67	12
	Total Exotic	40	13
	Unknown	10 (4 grasses & 6 forbs)	2 (forbs)
	Total Species	117	25

APPENDIX 3:

Fauna Records – Incidental Species List

Vertebrate fauna detected across Selwyn Snow Resort while conducting vegetation surveys and habitat assessments on 15th October 2020. Scientific nomenclature follows that used by the NSW Department of Planning, Infrastructure and Environment.

Detection Codes: O – Observed, H – Heard, S – Scats

Birds

Common Name	Scientific Name	Detection
Nankeen Kestrel	<i>Falco berigora</i>	O/H
Yellow-tailed Black Cockatoo	<i>Calyptorhynchus funereus</i>	H
Crimson Rosella	<i>Platycercus elegans</i>	H
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>	O/H
Brown Thornbill	<i>Acanthiza pusilla</i>	O/H
Striated Pardalote	<i>Pardalotus striatus</i>	H
Yellow-faced Honeyeater	<i>Caligavis chrysops</i>	H/O
Red Wattlebird	<i>Anthochaera carunculata</i>	O/H
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>	O/H
Black-faced Cuckooshrike	<i>Coracina novaehollandiae</i>	O/H
Australian Magpie	<i>Cracticus tibicen</i>	O
Pied Currawong	<i>Strepera graculina</i>	O/H
Willie Wagtail	<i>Rhipidura leucophrys</i>	O/H
Australian Raven	<i>Corvus coronoides</i>	H
Fairy Martin	<i>Petrochelidon ariel</i>	O
Australasian Pipit	<i>Anthus novaeseelandiae</i>	O/H
Common Starling	* <i>Sturnus vulgaris</i>	O/H
Unknown Bird 1	Possibly a whistler	H
Unknown Bird 2	Possibly another cuckoo species	H

Mammals

Common Wombat	<i>Vombatus ursinus</i>	S
^Broad-toothed Rat	<i>Mastacomys fuscus</i>	S
Horse	* <i>Equus caballus</i>	S
European Hare	* <i>Lepus europaeus</i>	S
Rabbit	* <i>Oryctolagus cuniculus</i>	S

^ fresh scats were found about 70 metres down stream of the Pump House within the creek line. Very little vegetation above the creek line of suitable height and density to provide refuge, safe passage and food for this species. Poa and other species of native tussock yet to attain full height since the bushfire.

Amphibians

+Common Eastern Toadlet	<i>Crinia signifera</i>	H/O
-------------------------	-------------------------	-----

+ heard along the creek near the Pump House and in the Quarry Dam at the top of the resort.

Reptiles

Eastern three-lined Skink	<i>Acritoscincus dupperei</i>	O
#Highland Copperhead	<i>Astrelaps ramsayi</i>	O

the animal looked thin and malnourished, suggesting limited feeding opportunities since exiting the winter brumation period.

*denotes introduced species

APPENDIX II – GEOTECHNICAL ENGINEERING (ACT GEOTECHNICAL ENGINEERING, 2020)

ACT Geotechnical Engineers Pty Ltd

TSA MANAGEMENT

SELWYN SNOW RESORT REDEVELOPMENT

KINGS CROSS ROAD, CABRAMURRA, NSW

**GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT
SUPPLEMENTARY REPORT**

SEPTEMBER 2020

ACT Geotechnical Engineers Pty Ltd
ACN 063 673 530

5/9 Beaconsfield Street, Fyshwick, ACT, 2609
PO Box 9225, Deakin, ACT, 2600
P: (02) 6285 1547 or 0404 064 858
E: Jeremy.murray@actgeoeng.com.au

30 September 2020
Our ref: JM/C10872

TSA Management
GPO Box 609
CANBERRA ACT 2601

Attention: Mr Marko Osti

Dear Sir

**PROPOSED SELWYN SNOW RESORT REDEVELOPMENT
KINGS CROSS ROAD, CABRAMURRA, NSW**

**GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT
SUPPLEMENTARY REPORT**

We are pleased to forward our supplementary geotechnical investigation and slope stability risk assessment for the proposed Selwyn Snow Resort Redevelopment, in Cabramurra, NSW.

The report outlines the methods and results of field investigations, describes site subsurface conditions, and provides the site classification to AS2870, as well as geotechnical recommendations for site earthworks, structure footings and a qualitative slope instability risk assessment.

The slope instability risk assessment is based on the landslide risk management concepts and guidelines issued by the Australian Geomechanics Journal Vol 35 March 2007 "Practice Note Guidelines for Landslide Risk Management 2007". By these criteria, it was established that the level of risk to be proposed and neighbouring dwellings and to people is "Very Low to Medium", and is no higher than normally acceptable for residential development.

Should you require any further information regarding this report, please do not hesitate to contact our office.

Yours faithfully

ACT Geotechnical Engineers Pty Ltd



Jeremy Murray
Senior Geotechnical Engineer
Director
FIEAust CPEng Eng Exec NER RPEQ APEC Engineer IntPE(Aust)

TSA MANAGEMENT

PROPOSED SELWYN SNOW RESORT REDEVELOPMENT
KINGS CROSS ROAD, CABRAMURRA, NSW

GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT
SUPPLEMENTARY REPORT

SEPTEMBER 2020

Form 1 – Declaration and certification made by geotechnical engineer or engineering geologist in a geotechnical report.

DA Number: _____

To be submitted with a development application

You can use Form 1 to verify that the author of a geotechnical report is a geotechnical engineer or engineering geologist as defined by the Department of Planning & Environment (DP&E) Geotechnical Policy. Alternatively, where a geotechnical report has been prepared by a professional person not recognised by DP&E Geotechnical Policy, then Form 1 may be used as technical verification of the geotechnical report if signed by a geotechnical engineer or engineering geologist as defined by the DP&E Geotechnical Policy.

Please contact the Alpine Resorts Team in Jindabyne for further information - phone 02 6456 1733.

To complete this form, please place a cross in the appropriate boxes and complete all sections.

1. Declaration made by geotechnical engineer or engineering geologist as part of a geotechnical report

I,
 Mr Ms Mrs Dr Other
 First Name Family Name
 JEREMY MURRAY

OF
 Company/organisation
 ACT GEOTECHNICAL ENGINEERS PTY LTD

on this the 29th day of September 2020

certify that I am a geotechnical engineer or engineering geologist as defined by the "Policy" and I (tick appropriate box)

prepared the geotechnical report referenced below in accordance with the AGS 2000 and DP&E Geotechnical Policy – Kosciuszko Alpine Resorts.

am willing to technically verify that the Geotechnical Report referenced below has been prepared in accordance the AGS 2000 and DP&E Geotechnical Policy – Kosciuszko Alpine Resorts.

2. Geotechnical Report Details

Report Title
 Selwyn Snow Resort Redevelopment - Geotechnical Investigation & Slope Stability Risk Assessment
 Supplementary Report

Author Dated
 Jeremy Murray 29/9/2020

DA Site Address
 Kings Cross Road, Cabramurra

DA Applicant

I am aware that the Geotechnical Report I have either prepared or am technically verifying, (referenced above) is to be submitted in support of a development application for the proposed development site (referenced above), and it's findings will be relied upon by the Consent Authority in determining the development application.

3. Checklist of essential requirements to be contained in a geotechnical risk assessment report to be submitted with a development application

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk Management Report. This checklist is to accompany the report.

Please tick appropriate box

- Risk assessment of all identifiable geotechnical hazards in accordance with AGS 2000, as per 6.1 (a) of the policy.
- Site plans with key hazards identified and other information as per 6.1 (b)
- Details of site investigation and inspections as per 6.1 (c)
- Photographs and/or drawings of the site as per 6.1 (d)
- Presentation of geotechnical model as per 6.1 (e)
- A specific conclusion as to whether the site is suitable for the development proposed on the above site, if applicable, subject to the following conditions;
 - Conditions to be provided to establish design parameters,
 - Conditions to be incorporated into the detailed design to be submitted for the construction certificate,
 - Conditions applying to the construction phase,
 - Conditions relating to ongoing management of the site/structure.

4. Signatures

Signature



Name

Jeremy Murray

Chartered professional status

CP Eng # 2122247

Date

29/9/2020

5. Contact details

Department of Planning & Environment
Alpine Resorts Team
Shop 5A, 19 Snowy River Avenue
PO Box 36, JINDABYNE 2627
Telephone: 02 6456 1733
Facsimile: 02 6456 1736
Email: alpineresorts@planning.nsw.gov.au

ACT Geotechnical Engineers Pty Ltd

TSA MANAGEMENT

SELWYN SNOW RESORT REDEVELOPMENT

KINGS CROSS ROAD, CABRAMURRA, NSW

GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT

JULY 2020

ACT Geotechnical Engineers Pty Ltd
ACN 063 673 530

5/9 Beaconsfield Street, Fyshwick, ACT, 2609
PO Box 9225, Deakin, ACT, 2600
P: (02) 6285 1547 or 0404 064 858
E: Jeremy.murray@actgeoeng.com.au

24 July 2020
Our ref: JM/C10872

TSA Management
GPO Box 609
CANBERRA ACT 2601

Attention: Mr Marko Osti

Dear Sir

**PROPOSED SELWYN SNOW RESORT REDEVELOPMENT
KINGS CROSSL ROAD, CABRAMURRA, NSW
GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT**

We are pleased to forward our geotechnical investigation and slope stability risk assessment for the proposed Selwyn Snow Resort Redevelopment, in Cabramurra, NSW.

The report outlines the methods and results of field investigations, describes site subsurface conditions, and provides the site classification to AS2870, as well as geotechnical recommendations for site earthworks, structure footings and a qualitative slope instability risk assessment.

The slope instability risk assessment is based on the landslide risk management concepts and guidelines issued by the Australian Geomechanics Journal Vol 35 March 2007 "Practice Note Guidelines for Landslide Risk Management 2007". By these criteria, it was established that the level of risk to be proposed and neighbouring dwellings and to people is "Very Low to Medium", and is no higher than normally acceptable for residential development.

Should you require any further information regarding this report, please do not hesitate to contact our office.

Yours faithfully
ACT Geotechnical Engineers Pty Ltd



Jeremy Murray
Senior Geotechnical Engineer
Director
FIEAust CPEng Eng Exec NER RPEQ APEC Engineer IntPE(Aust)

TSA MANAGEMENT
PROPOSED SELWYN SNOW RESORT REDEVELOPMENT
KINGS CROSSL ROAD, CABRAMURRA, NSW
GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT

JULY 2020



Form 1 – Declaration and certification made by geotechnical engineer or engineering geologist in a geotechnical report.

DA Number: _____

To be submitted with a development application

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Please contact the Alpine Resorts Team in Jindabyne for further information - phone 02 6456 1733.

To complete this form, please place a cross in the appropriate boxes and complete all sections.

1. Declaration made by geotechnical engineer or engineering geologist as part of a geotechnical report

I,

Mr Ms Mrs Dr Other _____
First Name Family Name

JEREMY MURRAY

OF

Company/organisation
ACT GEOTECHNICAL ENGINEERS

on this the 24th day of July 2020

certify that I am a geotechnical engineer or engineering geologist as defined by the "Policy" and I (tick appropriate box)

- prepared the geotechnical report referenced below in accordance with the AGS 2000 and DP&E Geotechnical Policy – Kosciuszko Alpine Resorts.
- am willing to technically verify that the Geotechnical Report referenced below has been prepared in accordance the AGS 2000 and DP&E Geotechnical Policy – Kosciuszko Alpine Resorts.

2. Geotechnical Report Details

Report Title
Selwyn Snow Resort Redevelopment - Geotechnical Investigation & Slope Stability Risk Assessment

Author Dated
Jeremy Murray 24/7/20

DA Site Address
Kings Cross Road, Cabramurr

DA Applicant

I am aware that the Geotechnical Report I have either prepared or am technically verifying, (referenced above) is to be submitted in support of a development application for the proposed development site (referenced above), and it's findings will be relied upon by the Consent Authority in determining the development application.

3. Checklist of essential requirements to be contained in a geotechnical risk assessment report to be submitted with a development application

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk Management Report. This checklist is to accompany the report.

Please tick appropriate box

- Risk assessment of all identifiable geotechnical hazards in accordance with AGS 2000, as per 6.1 (a) of the policy.
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 - Conditions applying to the construction phase,
 - Conditions relating to ongoing management of the site/structure.

4. Signatures

Signature



Chartered professional status

CP Eng # 2122247

Name

JEREMY MURRAY

Date

24/7/20

5. Contact details

Department of Planning & Environment
Alpine Resorts Team
Shop 5A, 19 Snowy River Avenue
PO Box 36, JINDABYNE 2627
Telephone: 02 6456 1733
Facsimile: 02 6456 1736
Email: alpineresorts@planning.nsw.gov.au

APPENDIX III – CIVIL ENGINEERING & INFRASTRUCTURE (TTW, 2020)

Civil Traffic & Hydraulics DA Report - VISITOR CENTRE

Selwyn Snow Resort

Prepared for Blyton Group / 29th October 2020

209064

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1.0 INTRODUCTION

This report has been prepared for the purpose of providing civil, traffic and hydraulics technical information to accompany the Development Application submission for the Visitor Centre building at the Selwyn Snow Resort.

2.0 Vehicle Access

2.1 Connection to Kings Cross Road

Vehicle access from the public road system to the Visitor Centre Building for service vehicles and deliveries is via the existing gravel road to the north of the site.

2.2 Internal Roadway

No internal road works are proposed as part of this DA.

2.3 Car Parking

A loading bay area is nominated off the internal roadway. The loading bay has been designed for use by small rigid vehicles to support the Visitor Centre operations. Grading of the vehicle bay is provided to conform with AS2890.2 with maximum grades of no more than 4%.

3.0 Stormwater

Stormwater is proposed to be drained to the west and north as per the drainage arrangements of the previous development area currently drains.

The hardstand elements are drained to the discharge point through a grassed swale located on the north side of the internal access road. The roadway and carparking areas will drain directly to the channel, and the roof areas will be piped to avoid issues associated with erosion over extended periods of wet weather.

TTW has carried out a stormwater assessment of the development site using DRAINS. The existing site conditions were modelled to determine an existing peak site discharge (68L/s), then the proposed development was modelled with all impervious areas (roads and roof areas) added to the model.

Due to all the works area being previously developed and containing impervious areas, the peak stormwater discharge from the developed site did not increase over the existing conditions. As such a detention strategy is not required.

Erosion of the proposed swale is prevented through grassing of the channel. Further erosion protection measures are not required due to the small catchment and the low flow rates.

For details of the proposed stormwater management system refer to the civil plans.

4.0 Water Supply

Water is supplied from the water tank nominated as part of the Staff Accommodation DA. For the route of the water main connecting to the Visitor Centre building refer to the civil plans and details.

4.1 Firefighting Water Supply

A total of 576,000L of dedicated firefighting water supply is proposed within the Quarry located atop the Selwyn Ski Resort. The 576kL of dedicated fire supply water will provide for flows of 10L/s per hydrant (4 off) for a period of 240 mins.

The fire fighting water supply is connected to in ground spring hydrants located at least 10m from the Visitor Centre building and at intervals not exceeding 60m.

All reticulation mains are to be buried steel, except for where they connect to the fire pump which is required to achieve the required pressure (700kPa) and 40L/s total flow rate.

4.2 Enlargement of the Quarry

To increase the available capacity of water storage on site, it is proposed to extend the footprint of the quarry to the south by constructing a new embankment nominally 1.5m high. The embankment will take the form of an earth embankment with a clay plug that seals the embankment to the underlying rock strata.

The ultimate capacity of the quarry would increase from 2.5ML to 5.6ML to ensure enough firefighting supply is available, whilst increasing the capacity for snow making.

The quarry will be fed by treated wastewater from the Visitor Centre, and through the existing water extraction license. Water levels shall be monitored to ensure that the pumping systems have a shutdown mechanism to prevent overfilling.

In the case of failure of any shutdown of the pumping system, the maximum overflow of the quarry would be limited to the maximum inflow rate from the supplies of 8.33L/s. Overflow facilities would be provided at the west and eastern ends of the embankment.

5.0 Wastewater Treatment

Wastewater from the Visitor Centre is proposed to be collected and treated using an aerated septic system that feeds a holding tank, where treated wastewater is pumped to the quarry for use in snowmaking. There are many variants to the wastewater treatment plan layout, and the layout illustrated on the civil plans has been prepared to cater for the wastewater treatment solution that occupies the largest area.

The treatment system will likely be installed above ground and shall be fenced and locked to restrict access to the public. Wastewater shall be treated to a level suitable for using the wastewater for snowmaking activities (i.e. spraying) and will be pumped to the quarry for storage. Refer to the civil plans for details of the reticulation route.

Due to the large scale and cost of the wastewater treatment system, the civil DA package does not nominate a specific product or set out of the system, however further details including a certificate of compliance of the system would be provided prior to procurement and confirmation of the exact area and layout of plant can be supplied once a system is confirmed.

No treated wastewater is proposed to be discharged to the surrounding landscape through drip irrigation.

6.0 Ancillary Works

Included in this DA are the works associated with the construction of a toboggan take off ramp that is located on the northern side of the resort over existing disturbed area. The ramp is nominally 2m high with batters of 1 in 4 to match into existing site levels as illustrated on the civil plans.

Also included in the DA is the provision for two above ground portable lifts located to the south of the Visitor Centre as nominated on civil drawing C220.

7.0 Maintenance Considerations

This section of the report deals with maintenance issues such as snow build up and clearing snow off roads.

Snow Push Material: Snow will be cleared from the pathways around the Visitor Centre building using a snow blower. Access for a number of snow blowing systems has been coordinated to ensure adequate access.

Snow Build-up: Snow loading and build-up will not affect the proposed civil and hydraulics works in this package. Care has been taken to grade the area to the south of the building during rainfall outside of periods of snow, so stormwater will not enter the building.

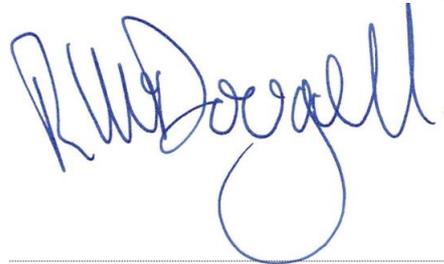
During peak season when the resort has snow cover the grades of the area adjacent the overland flows paths building will be infilled with snow and the area will become easily traversed by users of the facility.

Prepared by
TAYLOR THOMSON WHITTING (ACT) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING ACT TRUST



CHRISTIE PLAYER
Associate Director

Authorised By
TAYLOR THOMSON WHITTING (ACT) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING ACT TRUST



ROSS MCDOUGALL
Director

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Appendix A

Civil Plans

Civil Traffic & Hydraulics DA Report - ROC

Selwyn Snow Resort

Prepared for Blyton Group / 21st October 2020

209064

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1.0 INTRODUCTION

This report has been prepared for the purpose of providing civil, traffic and hydraulics technical information to accompany the Development Application submission for the Resort Operations Centre (ROC) at the Selwyn Snow Resort.

2.0 Vehicle Access

2.1 Connection to Kings Cross Road

Vehicle access from the public road system to the ROC is provided from Kings Cross Road via the existing vehicle crossover nominally in the north western corner of the site. The existing gravel road is proposed to be maintained with only local regrading proposed within nominally 15m of the ROC to provide connections to the proposed building.

Sight distances at the vehicle crossover have been checked in accordance with the Austroads Road Design Guidelines and sight distances available at the proposed intersection are in excess of 80m, exceeding the minimum requirements for an at grade intersection within a 60km/hr speed limited zone.

TTW have assessed the relationship between the Snowy Hydro – Kings Cross Road Alternations and the existing vehicle access arrangements to the ROC and can confirm that the alterations to Kings Cross Road will reduce traffic through the intersection. Sight distances to the north will be affected, and if the speed limit to the internal car park access road is reduced to 20km/hr or less after the Kings Cross Road alterations, the requirements for sight distances at the intersection would be further reduced.

2.2 Internal Roadway

The existing gravel road is proposed to be maintained with only local regrading proposed within nominally 15m of the ROC to provide connections to the proposed building.

The internal roadway is generally 6m wide to cater for 2 way traffic and to permit single vehicle movements into and out of the ROC and Ambulance Turning Bay.

The internal road is used for emergency vehicle access and has been designed in accordance with the requirements of the Planning for Bushfire Protection Code 2019 for maximum cross falls on roads to be 3 degrees and longitudinal grades to be less than 10 degrees.

2.3 Car Parking

Car parking has been facilitated adjacent the ROC for operational vehicles, and shall be managed operationally with staff.

To restrict access to the ROC car parking by guests of the resort, it is proposed that a no entry sign (authorised vehicles only) be placed at the intersection with Kings Cross Road.

3.0 Stormwater

Stormwater is proposed to be drained to the north as per the drainage arrangements of the previous development area currently drains.

The hardstand elements are drained to the discharge point through a grassed swale located on the north side of the internal access road. The roadway and carparking areas will drain directly to the channel, and the roof areas will be piped to avoid issues associated with erosion over extended periods of wet weather.

TTW has carried out a stormwater assessment of the development site using DRAINS. The existing site conditions were modelled to determine an existing peak site discharge (48L/s), then the proposed development was modelled with all impervious areas (roads and roof areas) added to the model.

Protection of the downstream environment from contamination caused by spilling of diesel during refilling of the operational vehicles at the entrance to the ROC is provided. The protection system consists of a pit and pipe stormwater system draining the refilling area through an oil separator to pick up any diesel contaminants before discharging downstream through a swale.

Due to the works area being previously developed and containing impervious areas, the peak stormwater discharge from the developed site did not increase over the existing conditions. As such a detention strategy is not required.

Erosion of the proposed swales is prevented through grassing of the channels. Further erosion protection measures are not required due to the small catchment and the low flow rates.

For details of the proposed stormwater management system refer to the civil plans.

4.0 Water Supply

Water is supplied from the water tank nominated as part of the Staff Accommodation DA. For the route of the water main connecting to the ROC refer to the civil plans and details.

4.1 Firefighting Water Supply

A total of 576,000L of dedicated firefighting water supply is proposed within the Quarry located atop the Selwyn Ski Resort. The 576kL of dedicated fire supply water will provide for flows of 10L/s per hydrant (4 off) for a period of 240 mins.

The fire fighting water supply is connected to four in ground spring hydrants located at least 10m from the ROC and at intervals not exceeding 60m.

All reticulation mains are to be buried steel, except for where they connect to the fire pump which is required to achieve the required pressure (700kPa) and 40L/s total flow rate.

5.0 Wastewater Treatment

Wastewater from the ROC is proposed to be collected and treated using an 1000L aerated septic system with a drip feed discharge system. The septic system is designed to cater for loading from up to 10 people and will be in operational outside of peak season. A bypass to the low volume septic treatment system will be provided in future stages of works, where wastewater will be dealt with using a large system.

The treatment tank will be installed below ground, with a nominal depth of 2.0m and nominal diameter of 2.4m. The treated waste water from the tank is suitable for drip irrigation and above ground spray irrigation, however only drip irrigation or subsurface filtration through subsoil is proposed (depending on rock level within irrigation areas) The extent of drip irrigation are is illustrated on the civil general arrangement plan C020 and is only proposed for use outside of peak season.

No fencing is proposed around the Wastewater Treatment System as the manholes are gatic type and access to all working parts or controls can be restricted through locking mechanisms.

For further details of the proposed septic system refer to the civil plans and Appendix A of this report.

6.0 Maintenance Considerations

This section of the report deals with maintenance issues such as snow build up and clearing snow off roads.

Snow Push Material: Snow pushed off the ROC access road is anticipated to be pushed to the landscape area north of the road.

There are no envisaged operational issues associated with clearing snow from gravel roads if the base course and gravel layers are compacted and trimmed to a smooth surface. The gravel road shall have a layer of road base laid to achieve a tightly compacted base with a layer of gravel rolled into the top 50mm to achieve an even surface providing a reasonable level of traction.

Sediments from the snow pushing activities will be captured by the landscaped area to the north of the ROC access road unless the area is covered in snow, then the sediment will be stopped by the downstream snow conditions.

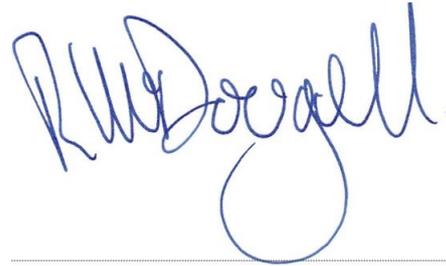
Snow Build-up: Snow loading and build-up will not affect the proposed civil and hydraulics works in this package.

Prepared by
TAYLOR THOMSON WHITTING (ACT) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING ACT TRUST



CHRISTIE PLAYER
Associate Director

Authorised By
TAYLOR THOMSON WHITTING (ACT) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING ACT TRUST



ROSS MCDOUGALL
Director

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Appendix A

Civil Plans