From:	Kennedy, Andrew
To:	Daniel James
Cc:	Mark Brown
Subject:	Smiggins Snowfactory
Date:	Tuesday, 17 October 2017 12:37:37 PM
Attachments:	28-17- Smiggins Snow Factory - Add Info - 10.10.17.pdf

Hi Daniel,

Please find attached supplementary information with regard to the operation of the proposed Snowfactory at Smiggin Holes.

Testing of water quality from Smiggins Creek has determined that it has low conductivity , being much cleaner than that of standard drinking water

We have been advised by TechnoAlpin that common salt will be required to be added to the incoming water supply for the Snowfactory to increase the conductivity of the water to ensure that the facility operates efficiently and the perfect ice crystal can be made.

Please contact me should you require further information.

Regards

Andrew Kennedy

Mountain Manager
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Department of Planning and Environment

Issued under the Environmental Planning and Assessment Act 1979

Approved Application No DA 8637

Granted on the 3 June 2022

Signed Mark Brown

Sheet No 13 of 16

Daniel James
Team Leader
Alpine Resorts Team
Department of Planning & Environment
Shop 5A, Snowy River Ave
Jindabyne NSW 2627

Dear Daniel,

Re: Supplementary Information in regard to DA 8637 for the installation of a Snowfactory at Smiggin Holes, Perisher Ski Resort, Kosciuszko National Park

Dabyne Planning Pty Ltd has been engaged by Perisher Blue Pty Ltd (Perisher), the operator of the Perisher Ski Resort to provide supplementary information with regard to the operation of the proposed Snowfactory at Smiggin Holes.

In preparation for the installation and operation of the Snowfactory, TechnoAlpin (TA) have analysed the quality of water that the facility would be using from Smiggins Creek to determine its suitability and in particular it's electrical conductivity to ensure that the facility operates efficiently and the perfect ice crystal can be made.

The water analysis undertaken by TA determined that the water was of low conductivity, being much cleaner than standard drinking water. Whilst this is generally a good outcome, the Snowfactory requires conductivity values at 500-1600 µS/cm (microSiemens per centimeter). The water testing found that Smiggins Creek had a conductivity value of 34 µS/cm.

Nb: Electrical Conductivity (EC) - is a measure of salinity. Electricity is conducted with increased ease as the concentration of dissolved salt in the water increases. Therefore, a high electrical conductivity indicates a high concentration of salt. It is measured in microSiemens per centimetre (µS/cm).

To achieve the optimal conductivity values, TA propose to use common salt to increase conductivity to the minimum standard of around 500 µS/cm.

This would require adding 21.9kg salt/day (a bag). It is understood this is fairly common with the operation of the Snowfactory, currently operating in Mt Buller, North Island New Zealand and around the world.

The Snowfactory uses 2 litres of water per second, therefore over a 24 hour operation, it would use 172,800 litres per day (0.173 ML).

This would equate to 0.127 grams of salt per litre.

Over a 60 day operation (the expected duration of Snowfactory operation over a typical season), the total salt use would be in the order of 1314kg.

With regard to the mean daily water flow within Smiggins Creek, which was recorded at 2.31 Mega Litres (ML) per day in 2013, the addition of one bag of salt to the overall water flow within the Creek would be equivalent to adding 0.0094 grams of salt per litre.

Use of the salt in Alpine Resorts and Kosciuszko National Park:

The RMS manage snow and ice clearing on the Kosciuszko Road, Alpine Way and Snowy Mountains Highway and in doing so use salt (both a wet salt mix and dry salt).

The RMS have advised Perisher that they used in 2016 approximately 120 tonnes (120,000kg) of salt on Kosciuszko Road, 70 tonnes (70,000kg) of salt on the Alpine Way and 25 tonnes (25,000kg) on the Snowy Mountains Highway.

The use of salt is concentrated on the sections of road that incur the most snow and ice, therefore those closest to the resort, particularly between Prussian Creek and the Perisher Car Park.

The proposed quantity of salt to be used for the Snowfactory over a typical season is approximately 1.1% of the quantity of salt used on Kosciuszko Road in 2016.

The presentation provided by RMS as a summary of this operation is provided in Attachment A. It is noted that the presentation referred to a study on how much salt is too much for Australian Alpine streams which is currently undertaken by the University of Canberra – Institute for Applied Ecology, with more information provided at this link:

http://appliedecology.edu.au/project/how-much-salt-is-too-much-the-australian-alpine-streams/

The study includes an Honours Thesis looking at the impacts of salt on macroinvertebrates and water chemistry, by sampling upstream and downstream of roads subject to salt application at Perisher and Falls Creek, as well as control sites. A further thesis is planned which will look at the impacts of specific salt levels on macroinvertebrates. No results are available as yet, with the first thesis expected to be completed in 2018.

Furthermore, the use of salt by the NSW ski resort operators and NPWS is extensive with regard to deicing car parks, internal roads, footpaths, stairs and the like.

Should you require any further information, please do not hesitate to contact me on the details provided below.

Regards

Ivan Pasalich
Principal

10 October 2017

Attachment A