# Technical Memorandum

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| **To:** | Angela Fenemor | **From:** | Tim Baker |
| **Company:** | Otago Regional Council | | **SLR Consulting New Zealand** |
| **cc:** | | **Date:** | 3 June 2026 |
| | | **Project No.** | 860.016625.00003 |

**RE: RM26.075 NZ Ski Ltd (FTA)**
**Doolans Creek Water Take Technical Peer Review**
**Wastewater Treatment Plant and Discharge**

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# 1.0 Introduction

SLR Consulting New Zealand Ltd (SLR) has been engaged by Otago Regional Council (ORC) to conduct a technical review of the Fast Track Consent Application to be submitted to the Environmental Protection Authority (EPA) by NZ Ski Limited to expand the Remarkables Ski Area into the Doolans Creek Right Branch catchment. This memorandum produced by SLR may be disclosed by ORC to the EPA and the EPA Hearing Panel as part of ORC's environmental audit of the consent application.

The application will be submitted under the Fast Track Approvals Act 2024 and Is a Listed Project under Schedule 2 of the Act. The purpose of this Technical Memorandum is to complete an independent technical review to support ORC in the preparation of their submission regarding the application to the Fast Track Panel.

I have read the Code of Conduct for Expert Witnesses in giving evidence to the Environment Court. I agree to comply with that code when giving evidence to the Panel in this matter. All my evidence is within my expertise, and I have considered and stated all material facts known to me which might alter or qualify the opinions I express.

# 2.0 Scope of Review

## 2.1 Scope

This preliminary review considers the Wastewater Treatment Plant (WWTP) and land-based treatment of the discharges; it does not include a review of the receiving environment water quality. This review is to provide ORC with initial comments to compile for the applicant, prior to lodgement of their Fast Track Consent Application to the EPA. This memorandum should not be considered a final review of the application.

## 2.2 Key Documents Reviewed

- Stantec New Zealand Limited, 2026. Remarkables Ski Area Expansion Project Doolans Creek Right Branch Wastewater Report, April 2026. Appendix B-16.
- Stantec New Zealand Limited, 2026. Remarkables Ski Area Expansion Project Wastewater Treatment and Disposal Feasibility Report, May 2026. Appendix B-17.

- e3 Scientific, 2026. Remarkables Ski Area Upgrade and Doolans Expansion - Wastewater Discharge Impact Assessment.

# 3.0 Background

NZSki is seeking consent to increase wastewater volumes discharged to land at The Remarkables Ski Area to support the proposed expansion into the Doolans Basin.

The Remarkables Ski Area currently operates an onsite wastewater system under ORC consent RM14.336.01, which permits up to 127 m³/day of treated effluent discharge, catering for approximately 4,000 skiers. The proposed expansion of the ski field, which will increase the capacity to 6,000 skiers, will increase the volume of wastewater generated. This will require a new consent for the discharge of up to 204 m³/day.

The ski field expansion is achieved by opening access into the adjacent Doolans Basin. The reports consider the options for wastewater disposal, the performance of the existing system, description of the proposed upgrades to the system and assessment of the effects of the proposed system.

# 4.0 Pre Application Review Comments

### Doolans Creek Right Branch Wastewater Report (Appendix B-16)

This report contains an evaluation of wastewater conveyance and discharge options (at concept design stage) for the ski field expansion project and presents a preferred option.

The report ‘sets the scene’ for the wastewater conveyance and discharge (and some treatment) component of the project, outlining the following challenges associated with wastewater treatment in alpine environments and seasonal discharge patterns:

- Significant seasonal variation in visitor numbers.
- Winter low temperatures which coincide with maximum visitor numbers.
- Steep topography with significant height differences.
- Operation and maintenance access challenges due to overlying snow during winter.
- The sensitive existing alpine natural environment.

Given the above considerations, the authors present a preferred option which:

- Does not discharge wastewater in the Doolans Basin.
- Pumps effluent over Helicopter Ridge and gravity feeds it to the existing/upgraded Rastus Burn wastewater system.
- Comprises:
    - A gravity fed macerating pump station in Doolans Basin
    - Two above ground progressive cavity pump stations and associated storage chambers
    - A rising main following existing formed trails up to Helicopter Ridge
    - A falling main with break chambers from the Helicopter Ridge down to the existing septic tank.

Overall, the basis for deciding on the preferred option is well considered minimising impact on the Doolan basin, keeping new infrastructure largely within exiting modified landscape and keeping discharge impacts to roughly the same footprint as they are currently.

I have no major comments or points requiring clarification on this report.

## Wastewater Treatment and Disposal Feasibility Report (Appendix B-17)

This report provides a detailed analysis of treatment options in the Rastus Burn with the objective of designing a practical, economical, and consentable wastewater system.

The report describes the current system that comprises:

- One pre settlement tank
- Two septic tanks
- An additional pre-settlement tank prior to the infiltration basis
- Three rapid infiltration basins (RIB) where wastewater infiltrates naturally through the soil, providing some passive treatment via filtration through the ground
- Off-site disposal of solids from the ponds
- Five groundwater monitoring bores to monitor discharge effects

The ponds were originally designed as decant and overflow ponds (overflowing to the burn), but they never functioned as intended and were modified in 2014 to function as rapid infiltration basins. The hydraulic loading was set at 20 mm/day, equating to an acceptable discharge capacity of approximately 127 $m^3$/day across the three ponds (combined they have a basal area of 6,100 $m^2$).

Infiltration testing in April 2026 indicated hydraulic conductivity ranging between 1.9-4.8 m/day, far more than the 20 mm/day adopted since 2014. On this basis, a design reliant on increasing the hydraulic loading to 50 mm/day (still conservative) has been advanced.

The applicant states that contingency in storage capacity is maintained given the freeboard in the basins (I agree) and that given the performance of the basins, the requirement of Clause 5.5.3.4 of AS/NZS 1547:2012 to maintain 100% reserve area, is achieved by intent of operating the three basins at a low design loading rate (DLR). I generally agree with this approach, subject to quality outcomes being achieved, and subject to clearly written operational contingency measures being documented in the WWTP Management Plan.

Historical and projected flow rates are discussed, and a design allowance of 34 L/person/day adopted based on a review of historic metering data and comparison to other ski field data. This seems reasonable and justified.

Baseline nutrient loads (nitrogen and phosphorus) are calculated based on a ‘first principles’ approach and compares the results to those derived by e3 in their assessment. It is not clear on first reading how Stantec have derived the results, and some further explanation would be helpful. It would also be helpful to explain which numbers are considered correct (Stantec vs e3), and which are then carried through to the effects assessment.

A range of wastewater treatment and disposal options are discussed in detail, but the report does not conclude what the optimal system is and so at this stage, I am unclear how this report fits into the application, other than demonstrate that an alternatives assessment has been completed. It would be useful to understand what the final system design is, and what water quality objectives it has been designed to meet.

## e3 Scientific Wastewater Discharge Impact Assessment

This assessment is quite broad ranging, and includes the site conceptual/physical setting description, a review of historic wastewater discharges, discussion of ongoing investigations and then an assessment of environmental effects. I have several comments/questions, outlined below.

Section 3.5 Hydrology

Almost all wastewater discharge to the RIBs eventually ends up in Rastus Burn, which means that understanding the flow regime, and having the ability to calculate contaminant mass-balances in the stream is important in assessing the effects of both the current and the future discharge. It appears the only flow gauging data are from a single event in May 2025 and that other flow data are assumed from NIWAs national river flow model. In my experience, that model is not appropriate for adopting in site specific assessments, and more flow gauging data should be provided to improve the reliability of this assessment.

Section 4.5 Contaminant Loads

The contaminant loads calculated in this section are derived from the monthly wastewater discharge concentrations multiplied by the monthly wastewater flow. However, later in the report (Table 16) the representativeness of these monthly samples is questioned (also discussed in the Stantec assessment) and yet the results are then carried forward into the assessment of effects sections. Some further discussion on data accuracy, reliability, adequacy and representativeness would be helpful.

Section 4.6 Proposed Preliminary Performance Criteria

These performance criteria appear to be based on the contaminant loads calculated in Section 4.5. The proposed criteria are lower than those calculated by Stantec (Appendix B-17 Section 3.4) and as such, it is not clear whether the assessment of effects on water quality (which is based on these numbers) is accurate. This section is critical in terms of presenting a robust assessment of effects so needs further work to ensure consistency and accuracy.

It is noted that NZ Ski have '*confirmed that the current nutrient loads will be maintained to preserve the good-excellent aquatic ecology in the Rastus Burn despite an increase in patronage and associated wastewater flows*' but given the uncertainty in data it is not clear what those current nutrient loads are.

Further explanation is required to:

- Explain the discrepancy in wastewater nutrient loads between Stantec and e3 and which are correct/adopted for the AEE
- Explain how these loads will change with the proposed increases in wastewater discharges
- Determine what the impact of increased wastewater loads on water quality will be (quantified)
- Clearly outline how performance criteria are linked to water quality objectives and that the WWTP design has considered this.

6.2 De-risking Investigations

A significant amount of baseline data and operational information is currently unknown. This section suggests much will be collected over the coming summer. Typically, this information would be known prior to approvals being sought. A clear explanation as to how any new data would be incorporated into the design is required. Additionally, if the future data were to

indicate a level of effect that is different from what is currently discussed, how that would be managed.

Section 7 Assessment of Effects

7.1 suggests that the proposed system will include nutrient management/treatment but it is not clear what the specifics of the system are, nor how this links in with the Stantec options assessment (i.e. which option proposed by Stantec is being assessed?).

7.2 Effects on Soils

There has been no sampling of seeps, groundwater exposures or soils so the assessment presented it largely qualitative. This section would benefit from some quantification of groundwater quality below the RIBs and from an assessment of soil quality.

7.3 Effects on Groundwater Quality

Again, this would benefit from some more quantification of groundwater impacts beyond the monitoring wells. I recognise this is steep and difficult terrain, but at it stands, the monitoring wells show significant impacts on groundwater but that is the extent of delineation of the effects.

## Summary

Overall, the assessment of effects is largely qualitative, and would benefit from more quantitative analyses to support the conclusions reached. The apparent discrepancies between e3 and Stantec with regards to the wastewater quality, and long list of 'future investigations' would also be helpful to resolve to present a more robust assessment.

I understand from reading these reports that rather than proposing a specific WWTP solution, the Applicant is seeking an 'envelope of effects' approach and seeks to demonstrate that there are WWTP options that can meet the required performance criteria. At this stage, there seems to be a high degree of uncertainty in the representativeness of wastewater data, and in how the current results have been used to determine performance criteria. I would recommend these items be addressed to allow for more confidence in the assessment of effects.

## Closure

I trust this technical review meets your requirements. If you have any questions, please don't hesitate to contact me.

Regards,

**SLR Consulting New Zealand**



**Tim Baker**
Principal Consultant