
MEMORANDUM

Recipient: Cheryl Low – Matakanui Gold Limited

From: Julie Palich – Geocontam Risk Management

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Document Title: Response to RFI 11 – Fast Track Approvals Application FTA-2507-1089 – Item 8 Sulfate and Nitrate Compliance Limits

Dear Cheryl,

Geocontam Risk Management Limited (GRM) is providing additional information in response to the Request for Information 11 (RFI 11) – Item 8 raised by the Environmental Protection Authority (EPA) on 25 June 2026, following the conclusion of expert hearings held during 8 – 19 June 2026 with respect to Matakanui Gold Limited's (MGL) Bendigo-Ophir Gold Project (BOGP) Fast-Track Approval Application FTA-25 07-1089, which requests provision of:

“Noting that the compliance limits for water quality have been amended in the 22 June 2026 updated Conditions, please provide an explanation for the proposed new sulfate and nitrate-nitrogen levels.”

Water quality compliance/performance limits for sulfate and nitrate-nitrogen (nitrate-N) have been assessed in consideration of both the protection of ecological values (freshwater and livestock) and beneficial use of groundwater (i.e. drinking water resource within the Shepherds Creek catchment only), as relevant to the receiving environment.

SULFATE WATER QUALITY COMPLIANCE/PERFORMANCE LIMITS

Protection of Freshwater and Livestock Values

As reported in Ryder (2025), there are no recognised guidelines in New Zealand or within the Australian & New Zealand Guidelines for Fresh & Marine Water Quality (ANZG) for the protection of freshwater ecosystems. The originally proposed compliance limit of 500 mg/L (based on US EPA approved criteria derived for the state of Iowa) for surface water (with appropriate hardness adjustment), as justified within (Ryder, 2025) remains valid for the protection of surface water freshwater values at all sites and is recommended for consent compliance monitoring at RS03 and for performance monitoring at all other sites within the Rise and Shine and Clearwater Creek catchments. This compliance limit is not, however, considered appropriate for the Shepherds Creek catchment due to its potential connectivity to a drinking water resource, as described in the following section.

The proposed compliance limit of 500 mg/L is additionally protective of livestock. The draft ANZG (2023) livestock drinking water guidelines (LDWG) state that, except for poultry, sulfate concentrations <500 mg/L in livestock drinking water should not be harmful to animal health. These guidelines note that chronic exposure effects seem to start at sulfate concentrations of 1,000 mg/L and that chronic or acute livestock health problems are expected at concentrations of 1,500–2,000 mg/L. The recommended

acute and chronic compliance limits for freshwater biota set out above will therefore provide adequate protection for livestock that drink water from the affected creeks.

Protection of Drinking Water Values

The 2022 NZ Drinking Water Standard for sulfate is 250 mg/L as a maximum value (MV). This aesthetic taste threshold is presented in the schedule of the New Zealand Aesthetic Values for Drinking Water Notice 2022 (issued under the Water Services Act 2021).

The Shepherds Creek catchment is hydrologically understood to infiltrate into the downstream Ardour Valley Aquifer, which is an alluvial system. A small number of nearby private water bores abstract groundwater from the Ardour Valley Aquifer, from which drinking water beneficial uses cannot be excluded.

The more conservative compliance limit for sulfate of 250 mg/L, being the drinking Water MV (DW MV), is recommended for consent compliance monitoring location SC01 and for performance monitoring at all other surface water monitoring locations within the Shepherd's Creek catchment to protect the beneficial values of the groundwater resource in the Shepherds Creek catchment.

Adoption of this more conservative compliance limit within the Rise and Shine Creek catchment is not warranted, as surface water from the Rise and Shine Creek catchment does not have a similar migration pathway into any aquifers that represent a potential drinking water resource.

NITRATE-NITROGEN WATER QUALITY COMPLIANCE/PERFORMANCE LIMITS

Protection of Freshwater and Livestock Values

Ryder (2025) originally recommended adoption of the National Policy Statement for Freshwater Management (NPSFM) (MfE, 2020) national bottom line Band B for nitrate-N, being <2.4 mg/L as the annual median and <3.5 mg/L as the annual 95th percentile due to the absence of fish values in the Shepherds and Rise and Shine Creek.

During water expert conferencing, concerns were raised by participating experts that exceedances of these guidelines could trigger periphyton growth and that concentrations permitted under the recommended guidelines in Ryder (2025) were substantially higher than currently observed baseline concentrations of nitrate-N in the Shepherds Creek and Rise and Shine Creek catchments where, respectively, median concentrations (0.06 mg/L and 0.002 mg/L) and 95th percentile concentrations (0.17 mg/L and 0.02 mg/L) are well below the national bottom line Band B criteria.

Under the updated ANZG (2025), which considers the effects of nitrate-N as a toxicant, the 90% species protection default guideline value (DGV) for nitrate-N is 1.5 mg/L. This DGV is considered to be better aligned with the catchment values and observed baseline water quality than the higher threshold originally proposed. Additionally, removal of nitrate to this concentration is considered to be achievable by the proposed Active Water Treatment Plant when it is required to be established.

The draft ANZG (2023) livestock drinking water guidelines (LDWG) state that nitrate concentrations <100 mg/L (equivalent to 22.6 mg/L nitrate-N) are safe for all livestock, including pregnant and lactating animals, assuming normal feed. As this concentration is higher than the ANZG (2025) DGV, adoption of the ANZG (2025) DGV will also be protective of livestock.

Protection of Drinking Water Values

The 2022 New Zealand Drinking Water Standard for nitrate-N is 11.3 mg/L and is the recommended consent compliance limit for groundwater monitoring sites associated with the BOGP. This is a maximum acceptable value (MAV) and should not be exceeded at any time.

Noting the previously discussed connectivity of surface water to groundwater in Shepherds Creek, the 2022 Drinking Water Standard is higher than the nitrate-N DGV for freshwater species protection, therefore it is not necessary to adjust the DGV at surface water compliance site SC01, as was proposed for sulfate, as the lower concentration adopted for freshwater species protection will also be protective of drinking water values in the Ardour Valley Aquifer.

SUMMARY

The ecological and water resource values approach used to justify the recommended compliance limits will ensure protection of water values within and surrounding the project area. For clarity, Table 1 summarises the revised recommended surface water and groundwater criteria for sulfate and nitrate-N.

Table 1: Recommended sulfate and nitrate-N compliance limits.

ANALYTE	MONITORING LOCATION	COMPLIANCE LIMIT	RATIONALE AND CONSIDERATIONS
Sulfate (mg/L)	SC01	250	NZ Drinking Water MAV protective of water resources in Ardour Valley Aquifer.
	RS03	500	As approved by US EPA (2009). Hardness and chloride adjustment ¹ if required using the following: A. If the hardness concentration (in mg/L as CaCO ₃) of water is less than 100 mg/L, or chloride concentration of water is less than 5 mg/L, the sulfate water quality standard is 500 mg/L. B. If the hardness concentration of water is between 100 mg/L and 500 mg/L and if the chloride concentration of water ranges between 5 mg/L and less than 25 mg/L the sulfate surface water quality compliance limit is: $\text{Sulfate (mg/L)} = [-57.478 + 5.79 (\text{hardness mg/L CaCO}_3) + 54.163 (\text{chloride mg/L})] * 0.65$ C. If the hardness concentration of water is between 100 mg/L and 500 mg/L, and if the chloride concentration of water is between 25 mg/L and 500 mg/L, the sulfate water quality standard is: $\text{Sulfate (mg/L)} = [1276.7 + 5.508 (\text{hardness}) - 1.457 (\text{chloride})] * 0.65$
	GW01	250	NZ Drinking Water MAV protective of water resources in Ardour Valley Aquifer.
Nitrate-N (mg/L)	SC01	1.5	ANZG (2025) 90% species protection limit as a toxicant. Listed for soft water (<30 mg/L) ² .
	RS03	1.5	ANZG (2025) 90% species protection limit as a toxicant. Annual 95%ile, listed for soft water (<30 mg/L)
	GW01	11.3	NZ Drinking Water MAV protective of water resources in Ardour Valley Aquifer.

1. Hardness and chloride condition A currently applies based on baseline data.

2. The annual 95%ile hardness for baseline is >150 mg/L which would raise the toxicant limit to 29 mg/L. Compliance screening will be done against the lower soft water limit with adjustments made if exceedances are identified.

CLOSING REMARKS

We trust that the information provided adequately addresses the matters raised in the Request for Information. Should the assessing authority require any further clarification or additional information, we would welcome the opportunity to assist. We appreciate your consideration of this response in progressing the assessment of the application.

REFERENCES

ANZG. 2023. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality: Livestock Drinking Water Quality*. Water Quality Australia, Australian and New Zealand Governments.
<https://www.waterquality.gov.au/anz-guidelines>.

ANZG. 2025. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian state and territory governments, Canberra.
<https://www.waterquality.gov.au/anz-guidelines>.

Ministry for the Environment (MfE). 2020. *National Policy Statement for Freshwater Management 2020*, Ministry for the Environment, Wellington, New Zealand.

New Zealand Government. 2022. *Water Services (Drinking Water Standards for New Zealand) Regulations 2022. Schedule: Drinking Water Standards for New Zealand*. Wellington, New Zealand.
Available at: <https://www.legislation.govt.nz/regulation/public/2022/0168/latest/whole.html>.

Greg Ryder Consulting. 2025. *Recommended water quality compliance limits for the Bendigo-Ophir Gold Project*. Prepared for Matakanui Gold Limited. Version 4.2 dated 30 July 2025.

Water Services Act 2021, 2021 No 36 (NZ).