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MEMORANDUM

Recipient:	Cheryl Low – Matakanui Gold Limited
From:	Julie Palich – Geocontam Risk Management
Date:	11 August 2026
Document Number:	J-H-NZ0238-006-M-Rev0
Document Title:	Response to RFI 11 – Fast Track Approvals Application FTA-2507-1089 – Item 1a Downstream Catchment Baseline Water Quality

Geocontam Risk Management Limited (GRM) is pleased to provide additional information in response to the Request for Information 11 (RFI 11) – Item 1a 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. RFI 11 – Item 1a that specifically requests provision of:

"*Further information to understand the downstream catchment's baseline environment including water quality.*"

This response specifically addresses baseline water quality associated with the receiving surface water environment at Bendigo Creek and Lindis River and is supported by:

- Monitoring locations SW13 (Bendigo Creek) and SW14 (Lindis River), which were established downstream of the BOGP Project area to characterise baseline receiving-environment water quality conditions prior to project development. These monitoring locations provide baseline dataset against which future project related effects can be assessed during the operational, closure and post closure phases of the Project. Surface water quality monitoring has been undertaken at SW13 and SW14 on two occasions during 2026. The results presented in Attachment A include data collected during June and July 2026 and provide the initial baseline dataset for downstream receiving-environment monitoring locations:
    - SW13 located along Bendigo Creek, approximately 3 km downstream of consent compliance monitoring location RS03.
    - SW14 located on the Lindis River at the ORC Ardgour Road site.

  Water quality monitoring at these locations included:
    - General water quality parameters – pH, electrical conductivity (EC), total dissolved solids (TDS), total suspended solids (TSS), dissolved oxygen (DO), dissolved organic carbon (DOC), and hardness),
    - Major cations and anions – calcium (Ca), magnesium (Mg), potassium (K), sodium (Na), chloride (Cl), sulfate (SO_4), bicarbonate alkalinity (HCO_3) and carbonate (CO_3) alkalinity.

- Nutrients – total nitrogen (TN), total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO_3-N), ammonia-nitrogen (NH_3-N), and dissolved reactive phosphorus (DRP).
- Total cyanide (CN).
- Total metals – antimony (Sb), iron (Fe), and selenium (Se).
- Dissolved metals – aluminium (Al), arsenic (As), boron (B), cadmium (Cd), total chromium (Cr), cobalt (Co), copper (Cu), Fe, manganese (Mn), molybdenum (Mo), and zinc (Zn).

- A review of the long-term water quality monitoring record collected by the Otago Regional Council (ORC), noting there is no independent water quality monitoring of the Bendigo Creek main stem undertaken by the ORC, or any other party. Relevant monitoring on the Lindis River occurs at the:
  - Ardgour Road flow recorder site.
  - An upgradient site at Lindis Peak, approximately 20 km upstream of Ardgour Rd.

  The ORC archives flow data and water quality data at these stations on pH, ammonia-nitrogen (NH_3-N), nitrate-nitrogen (NO_3-N), dissolved reactive phosphorus (DRP), and *E. coli* for these locations.

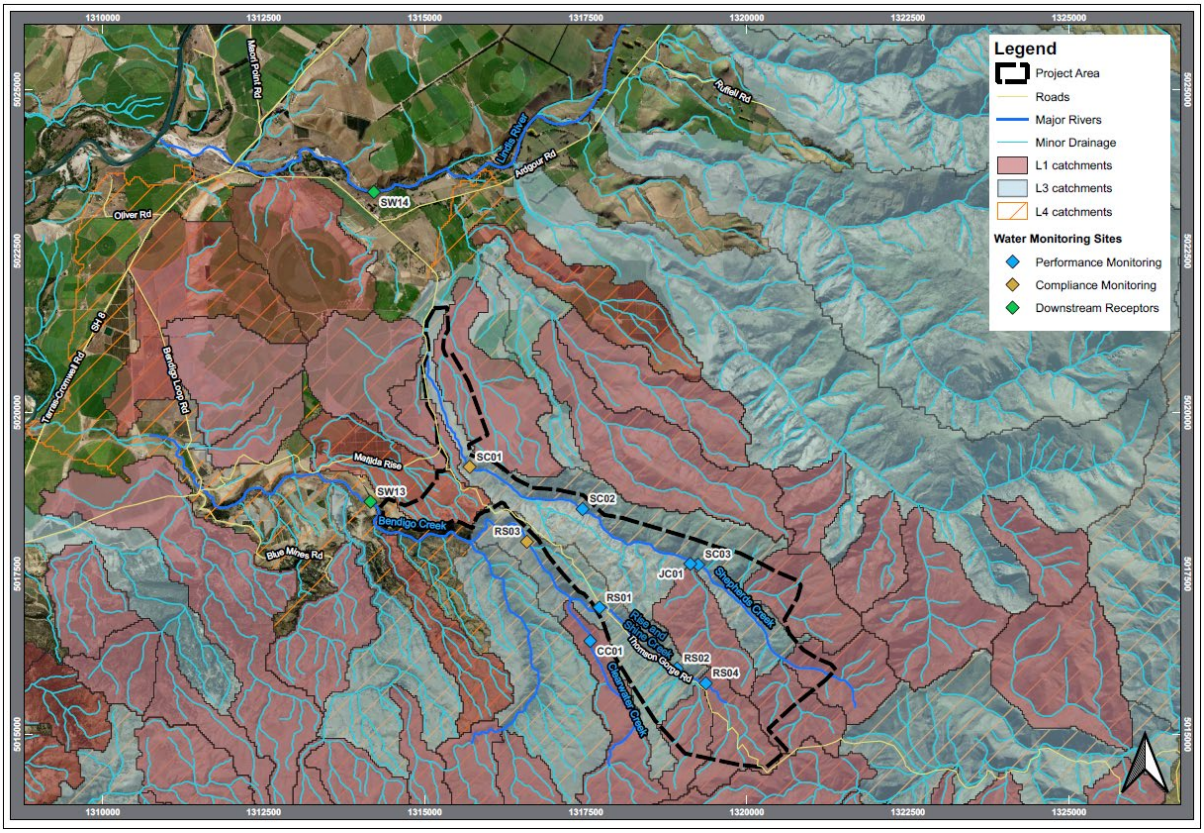

Figure 1: Surface water monitoring locations.

BACKGROUND HYDROLOGY

The following hydrologic conditions are recognised in association with the receiving waters of the Lindis River and Bendigo Creek downstream of the BOGP. Potential water quality impacts from the BOGP have the potential to impact these receiving waters on the basis that the Lindis River receives subsurface flow from the Shepherds Creek catchment, and Rise and Shine Creek is a small tributary of Bendigo Creek.

Lindis River

The Lindis River at Ardgour Road has mostly base-flow dominated hydrology and solute processes predominate over this reach of the river. This site is notable in being bounded upstream and downstream by dry riverbed during late summer low flow periods. During this time river water moves primarily by interflow within the hyporheic zone coarse sandy gravels of the Lindis Alluvial Ribbon Aquifer. By whichever mechanism, the subsurface flows persistently surfaces in the small river reach either side of the flow monitoring site, perhaps bound by a low permeability geological feature beneath the perennial river reach (KSL, 2026).

The catchment in this area is water short and dominated by surface and groundwater abstraction during the irrigation season, particularly in late summer - early autumn when the river is typically broken by dry reaches. However, the ORC flow recorder site is a perennially hydrated reach of the lower Lindis River. During low flows, it is sustained by groundwater interflow that surfaces along the reach, perhaps due to a squeeze in the thickness of the braid plain alluvium.

The upstream portion of the catchment is undergoing increasing agricultural intensification that can be expected to result in a gradual increase of the median nitrate concentration in the river over time. Monthly flow and water quality monitoring (with gaps) has been instituted since September 2005. The upstream monitoring site at Lindis Peak is mostly upstream of irrigation intakes that impose a substantial load upon the lower river during the irrigation season and is therefore interpreted to be representative of water quality unimpacted by agricultural land use, providing a good basis for differentiating between natural and anthropogenic impacts within the catchment at Ardgour Rd.

Bendigo Creek

Rise and Shine Creek is a small tributary of Bendigo Creek with the Mean Annual Low Flow (MALF) of the tributary estimated at 1.3 – 5 L/sec, whereas the Bendigo Creek main stem has an MALF estimated at 33 L/sec (KSL, 2025). Therefore, the low flow yield of Rise and Shine Creek is less than 15% of the comparative yield of the larger catchment.

Surface water is abstracted from Bendigo Creek by Bendigo Station Limited for irrigation purposes, under consent RM12.301.15, which permits abstraction up to 50 L/s. This abstraction site is located upstream of the ORC flow gauging and water quality monitoring site.

BASELINE WATER QUALITY EVALUATION

Baseline water quality results for the Lindis River (monitoring location SW14) and Bendigo Creek (monitoring location SW13) are provided in Attachment A. For context, water quality results from SW13 and SW14 have been compared with baseline monitoring data from Project compliance monitoring locations SC01 and RS03 (based on monitoring data site obtained between April 2023 and May 2026), and with the proposed Project surface water compliance limits where relevant. SW13 and SW14 are

not compliance monitoring locations. Rather, the comparison provides context regarding how existing downstream receiving-environment conditions compare with water quality conditions observed within the Project area and the proposed compliance framework.

Lindis River at Ardgour Rd

Surface water quality at SW14 in June and July 2026 was characterised as follows:

- Near-neutral (pH 6.6 – 7.1), and fresh with an EC of 53.1 – 56.5 μS/cm and TDS of 49 - 50 mg/L. In contrast, surface water at SC01 is characterised as neutral to alkaline (pH 7.7 – 8.5), and fresh (EC 340 – 695 μS/cm) conditions.
- Turbidity and TSS were elevated reporting concentrations of 41 – 31.1 NTU and 10.7 – 111 mg/L, during the June and July 2026 monitoring events, respectively. Turbidity and TSS were notably above the long-term medians (1.9 NTU and 6 mg/L, respectively) and were above the range of historically observed values at SC01. Turbidity exceeded the SC01 compliance limits during both events, and TSS exceeded the SC01 compliance limit during the July monitoring event. The elevated turbidity and TSS, reported on 24 July 2026, are associated with higher river flow associated with a storm event that occurred in the 12-hour period prior to the sampling. Increased turbidity and TSS are interpreted to be associated with this seasonal first flush storm event based on the long-term flow dataset (ORC, 2026).
- Surface water is characterised as soft (<50 mg/L as $CaCO_3$) as opposed to SC01, which is characterised as a hard water (260 mg/L as $CaCO_3$).
- Based on the major cation and anion composition, surface water at SW14 is characterised as a fresh, low-mineralisation calcium-bicarbonate (Ca-HCO_3) water type. Major ion concentrations are generally low, indicating limited salinity and a low dissolved solids content. In contrast, surface water at SC01 is characterised as a calcium-magnesium-bicarbonate water type reflective of surface waters influenced by natural weathering of carbonate-bearing rocks, soils, or catchment materials.
- The TN concentration (0.3 mg/L) in SW14 comprises a balanced mix of organic nitrogen and NO_3-N with NO_3-N concentrations notably higher than at SC01, likely reflecting the pastoral land use upstream of SW14.
- Total phosphorus (TP) was higher at SW14 than the long-term median for SC01; however, phosphorus concentrations at both monitoring sites were present in particulate or organic forms rather than as readily bioavailable phosphate.
- Total Fe concentrations were reported at 1.01 mg/L and 2.46 mg/L during the June and July 2026 monitoring events, respectively. These concentrations are above the proposed Project surface water compliance limit of 0.3 mg/L. Whilst SW14 is not a compliance monitoring location, these results demonstrate that iron concentrations within the downstream receiving environment may exceed the proposed compliance criterion under existing catchment conditions.
- Dissolved Al (0.03 mg/L) and Fe (0.044 mg/L) were relatively low but exceeded the long-term median for SC01. The higher Al and Fe concentrations at SW14 relative to SC01

suggest that additional geological sources, land-use influences, or natural catchment processes operating between the upstream and downstream monitoring locations may contribute to observed concentrations at SW14.

- Compilation and evaluation of the historical water quality monitoring data at Lindis River at Ardgour Rd and Lindis Peak (KSL, 2025), with respect to pH, *E. coli*, and nutrients (NO_3-N, NH_4-N , and DRP), is provided in further detail in Attachment B. Within the limitations of the analytes available for comparison (i.e. excluding *E. coli*), the following evaluation is made regarding the SW14 baseline monitoring results collected during June and July 2026:
    - The field and laboratory reported pH at SW14 is lower than the range of values historically reported at the Lindis River at Ardgour Rd continuous monitoring station. This may reflect slight calibration issues with the continuous pH probe at the monitoring station given field and laboratory pH from the sampling events at SW14 exhibited a close correlation.
    - Concentrations of NO_3-N exhibit notable temporal and seasonal variation, with higher concentrations typically observed annually between May and August. The volatility in the winter and spring season is interpreted to be associated with high river flow rates and depletion. In contrast the relative stability in concentrations in autumn and summer is interpreted to be associated with low river flows over the irrigation season and elevated evapotranspiration The maximum observed concentration between January 2014 and December 2018 was 0.12 mg/L (July 2016), which is comparable to the 0.11 mg/L reported at SW14 during the July 2026 baseline monitoring event.
    - Consistent with the baseline monitoring result at SW14, NH_3-N is typically reported below the limit of detection (0.005 mg/L) although sporadic detections have been reported throughout the historical monitoring dataset. Concentrations reported above the limit of detection, do not appear to exhibit seasonality however do generally seem to overlap with increased NH_3-N concentrations at the Lindis Peak monitoring station, suggesting sources exist higher up in the catchment.
    - Consistent with the baseline monitoring result at SW14, concentrations of DRP have historically fluctuated between 0.001 mg/L ant 0.007 mg/L at the Lindis at Ardgour Rd station and are typically slightly higher than concentrations at Lindis Peak. Concentrations do not appear to exhibit seasonality and are generally low. No compliance limits have been recommended for DRP for the BOGP project, due to an absence of operational sources, and the low concentrations within the catchment suggests compliance limits are unwarranted.

Bendigo Creek

Surface water quality at SW13 in June and July 2026 was characterised as follows:

- Near-neutral (pH 6.5), and fresh with an EC of 32.5 μS/cm and TDS of 39 mg/L. In contrast, surface water at RS03 is characterised as neutral to alkaline (pH 7.0 – 9.3), and fresh (EC 54 – 121 μS/cm)
- Turbidity and TSS were both low reporting concentrations of 2.84 NTU and 8 mg/L, respectively. Turbidity was above the long-term median (0.5 NTU) at upstream compliance monitoring site RS03 but was within the range of historically observed values. The elevated turbidity and TSS, reported on 24 July 2026, are associated with higher river flow associated with a storm event that occurred in the 12-hour period prior to the sampling. Increased turbidity and TSS are interpreted to be associated with this seasonal first flush storm event similar to what was observed at SW14.
- Surface water is characterised as soft (<50 mg/L as $CaCO_3$) consistent with for RS03.
- Based on the major cation and anion composition, surface water at SW13 and RS03 is characterised as a calcium-dominated bicarbonate water. Major ion concentrations are generally low, indicating limited salinity and a low dissolved solids content.
- The TN concentration (0.4 mg/L) in SW13 comprises predominantly organic nitrogen, as opposed to inorganic NO_3-N and NH_3-N, which were both reported below the limit of detection. Concentrations of NO_3-N and NH_3-N were comparable to those reported at RS03, which have historically been reported below or near the limit of detection.
- Total phosphorus (TP) was higher at SW13 than the long-term median for RS03; however, phosphorus concentrations at both monitoring sites were present in particulate or organic forms rather than as readily bioavailable phosphate.
- Total Fe concentrations were reported at 0.032 mg/L and 0.467 mg/L during the June and July 2026 monitoring events, respectively. The July concentration exceeded the proposed Project compliance limit of 0.3 mg/L. Whilst SW13 is not a compliance monitoring location, this result demonstrates that short-term variability in downstream receiving-environment water quality may result in concentrations above the proposed compliance criterion under existing catchment conditions.
- Total Sb (0.005 mg/L – July 2026), and dissolved Al (0.04 – 0.042 mg/L) and Fe (0.068 mg/L – July 2026) exceeded the long-term median at RS03 with dissolved Al (June and July 2026) and total Sb (July 2026) also exceeding the maximum reported concentrations at RS03. The higher Al and Sb concentrations at SW13 relative to RS03 suggest that additional geological sources, land-use influences, or natural catchment processes operating between the upstream and downstream monitoring locations may contribute to observed concentrations.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are drawn based on baseline water quality monitoring undertaken to date at the Lindis River at Ardgour Rd.

- Two rounds of baseline monitoring have been completed at SW13 and SW14 to date. The results indicate generally consistent water quality characteristics between sampling events, with observed differences reflecting normal temporal variability within the receiving environment.
- Baseline water quality of the Lindis River at Ardgour Rd (SW14) is predominantly indicative of a freshwater system with the ability to support the protection of sensitive aquatic species and the maintenance of freshwater ecosystem functions.
- There is some seasonal evidence of anthropogenic disturbance from pastoral and grazing land use within the Lindis River catchment, with NO_3-N concentrations seasonally elevated and present at concentrations higher than at the upstream BOGP compliance monitoring location SC01. Nitrate (NO_3-N) concentrations at SW14 are likely influenced by diffuse agricultural inputs, including livestock activity, soil mineralisation, or runoff from grazed areas.
- Elevated total iron concentrations were observed at SW14 during both baseline monitoring events. The disparity between total and dissolved iron concentrations, together with elevated suspended sediment concentrations, indicates that iron is predominantly associated with particulate material rather than occurring in dissolved form. Comparison with the proposed Project compliance limits indicates that total Fe concentrations at the downstream baseline monitoring sites can exceed the proposed compliance criterion under existing catchment conditions. As SW14 is a receiving-environment baseline location rather than compliance monitoring sites, these results provide important context for future interpretation of monitoring data.
- Other metals including total and dissolved Fe, and dissolved Al at SW14 were higher than the long-term median at SC01. The disparity between total and dissolved metal concentrations, together with the elevated turbidity and TSS results, suggests that these metals are predominantly associated with suspended sediments rather than dissolved in the water column. This indicates that natural geological sources, soil erosion, catchment runoff, or other upstream land-use activities are likely contributing to metal concentrations at SW14, rather than impacts originating from the SC01 catchment or the BOGP project area.

The following conclusions are drawn based on baseline water quality monitoring undertaken to date at Bendigo Creek.

- Baseline water quality in Bendigo Creek (SW13) downstream of the Rise and Shine Creek supports high freshwater environmental values and is generally consistent with the protection of sensitive aquatic ecosystems. Water quality characteristics were broadly comparable to those observed at the upstream compliance site RS03, suggesting that

historical mining activities are not currently impacting downstream values of the Bendigo Creek.

- Nutrient concentrations indicate a low level of nutrient enrichment. Total nitrogen was dominated by organic nitrogen, indicating limited availability of dissolved inorganic nitrogen. Similarly, total phosphorus was predominantly present in particulate or organic forms rather than dissolved reactive phosphorus. Consequently, the risk of nutrient-driven eutrophication appears low, as the fraction of nutrients immediately available for algal uptake was limited.
- The principal water quality indicators of potential concern at SW13 were metals. Concentrations of Al, Sb and Fe were higher than reported at upstream compliance monitoring location RS03 and therefore suggest the influence of localised geological conditions, natural weathering processes, sediment mobilisation, or other catchment-derived sources that are not necessarily associated with historic mining sources within the Rise and Shine Creek. Further, the absence of corresponding changes in major ions, salinity or nutrient concentrations provides limited evidence for a direct anthropogenic signature in the water chemistry. As SW13 is a receiving-environment baseline location rather than compliance monitoring sites, these results provide important context for future interpretation of monitoring data.

Monitoring locations SW13 and SW14 provide important downstream receiving-environment baseline water quality information for the Project. Baseline monitoring undertaken at SW13 and SW14 during June and July 2026 has established the initial receiving-environment water quality dataset for downstream surface waters associated with the Project area. Results obtained to date indicate generally consistent water quality characteristics between the June and July 2026 monitoring event, with observed differences interpreted to reflect natural temporal variability within the catchment.

Ongoing monthly monitoring will continue to characterise seasonal and inter-annual variability, improve understanding of natural catchment processes, and assist in distinguishing these influences from any future Project-related effects during commissioning, operation, closure and post-closure phases.

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.

Attachments: Attachment A – Surface Water Quality Monitoring Results
Attachment B – Lindis River ORC Water Quality Data Evaluation

REFERENCES

Komanawa Solutions Ltd. 2025. Bendigo-Ophir Gold Mine Project – Surface Water and Catchment Existing Environment and Effects Assessment.

Komanawa Solutions Ltd. 2026. Instituting Water Quality Monitoring of the Lindis River and Bendigo Creek. Prepared for Matakanui Gold Limited 11 March 2026.

Otago Regional Council. 2026. Environmental Data Portal – Lindis at Ardgour 30 Day flow data. https://envdata.orc.govt.nz/AQWebPortal/Data/Location/Dashboard/631/Location/EM195/Interval/Latest

ATTACHMENT A – SURFACE WATER QUALITY MONITORING RESULTS

Attachment A
BOGP Lindis River and Bendigo Creek
Table 1: Surface Water Quality Results

			Field Parameters							Water Quality Parameters					Hardness				Major Ions									
			Temperature	Dissolved Oxygen (%)	Dissolved Oxygen	Electrical Conductivity	pH	ORP (mV)	Turbidity	Total Dissolved Solids (Lab) (filtered)	Total Suspended Solids (Lab)	Dissolved Oxygen	Dissolved Organic Carbon	Turbidity	Calcium Hardness	Magnesium Hardness	Soluble Hardness	Total Hardness	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Sodium	Sodium (filtered)	Potassium	Potassium (filtered)	Chloride (filtered)	Sulfate (filtered)
Field ID	**Date**	**ALS Sample Code**	**°C**	**%**	**mg/L**	**µS/cm**	**--**	**mV**	**NTU**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**NTU**	**mg CaCO3/L**	**mg CaCO3/L**	**mg CaCO3/L**	**mg CaCO3/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
EQL			--	--	--	--	--	--	--	3	3	0.1	0.5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.01	0.01	0.01	0.01	0.05	0.05	0.5	0.15
LINDIS RIVER CATCHMENT																												
COMPLIANCE LIMITS - SC01			--	--	--	--	6.5 - 9.0	--	--	--	50	--	--	5	--	--	--	--	--	--	--	--	--	--	--	--	--	250
MEDIAN - SC01 (24/04/2023 - 20/05/2026)			--	--	--	540	8.2	--	1.89	284	6	--	2	1.9	--	--	--	260	--	66.7	--	23.6	--	13.6	--	1.8	5.7	46.5
SW14	25-Jun-26	NH2602707002	3.9	100.6	12.5	34.3	6.76	202.3	7.16	50	41	--	--	10.7	16.1	5.99	22.1	--	6.76	--	1.83	--	3.07	--	1.11	--	0.9	2.26
SW14	24-Jul-26	NH2602985002	4.6	97.5	12.32	60.6	8.26	172.1	15.8	49	111	10.9	3.2	31.1	15.8	6.01	21.8	26.3	6.99	6.32	2.15	1.46	3.31	2.93	1.72	0.61	0.9	1.99
BENDIGO CREEK CATCHMENT																												
COMPLIANCE LIMITS - RS03			--	--	--	--	6.5 - 9.0	--	--	--	50	--	--	5	--	--	--	--	--	--	--	--	--	--	--	--	--	500
MEDIAN - RS01 (24/04/2023 - 20/05/2026)			--	--	--	87.4	7.31	--	0.495	47	--	11.4	2	0.5	--	--	--	35	--	10.8	--	2.14	--	3.41	--	0.5	1.27	0.95
SW13	25-Jun-26	NH2602707002	5.9	98.4	11.75	56.7	6.85	123	34.05	45	<3	--	--	0.26	15.7	5.1	20.8	--	6.42	--	1.29	--	2.72	--	0.44	--	1.2	0.96
SW13	24-Jul-26	NH2602985001	3.8	101	12.88	54.3	8.14	175.5	2.33	39	8	11.6	7.7	2.84	9.35	3.29	12.6	13.9	4.06	3.74	0.92	0.8	2.25	2.05	0.78	0.7	1	0.66

(##) acute compliance limit not to be exceeded

Attachment A
BOGP Lindis River and Bendigo Creek
Table 1: Surface Water Quality Results

			Inorganics					Nutrients						Metals															
			pH (Lab)	Electrical Conductivity (Non Compensated)	Bicarbonate	Carbonate Alkalinity	Cyanide Total	Nitrogen (Total)	Kjeldahl Nitrogen Total	Nitrate (as N) (filtered)	Ammonia as N (filtered)	Total Phosphorus as P (Organic Phosphate as P)	Dissolved Reactive Phosphorus as P	Aluminium (filtered)	Antimony	Antimony (filtered	Arsenic (filtered)	Boron (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Cobalt (filtered)	Copper (filtered)	Iron	Iron (filtered)	Manganese (filtered)	Molybdenum (filtered)	Selenium	Zinc (filtered)
Field ID	**Date**	**ALS Sample Code**	--	µS/cm	g CaCO3/m3	g CaCO3/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EQL			0.01	10	1	1	0.002	0.1	0.1	0.002	0.005	0.005	0.002	3	0.1	0.0001	0.5	5	0.02	0.2	0.01	0.2	5	5	0.5	0.2	0.5	1
LINDIS RIVER CATCHMENT																												
COMPLIANCE LIMITS - SC01			6.5 - 9.0	--	--	--	0.007	--	--	1.5	0.4	--	--	0.055	0.02	--	0.013	0.94	0.0002	0.001	0.0014 (0.11)	0.0014	0.3	--	1.9	0.01	0.005	0.0008
MEDIAN - SC01 (24/04/2023 - 20/05/2026)			8.2	540	226	5	0.001	--	--	0.06	0.005	0.013	0.004	0.003	0.0002	--	0.0024	--	0.00002	0.0002	0.00009	0.0005	--	0.01	0.002	0.0005	0.0006	0.001
SW14	25-Jun-26	NH2602707002	7.17	56.5	24	<1	<0.002	0.3	--	0.098	<0.005	0.067	0.004	0.016	<0.0001	<0.0001	0.0005	<0.01	<0.00002	0.0002	0.00008	0.0005	1.01	0.029	0.0023	<0.0002	<0.001	<0.001
SW14	24-Jul-26	NH2602985002	6.59	53.1	25	<1	<0.002	0.3	0.16	0.11	<0.005	0.078	0.004	0.030	<0.0001	<0.0001	0.0006	<0.01	<0.00002	<0.0002	0.00008	0.0006	2.46	0.044	0.0019	<0.0002	<0.001	0.001
BENDIGO CREEK CATCHMENT																												
COMPLIANCE LIMITS - RS03			6.5 - 9.0	--	--	--	0.007	--	--	1.1	0.04	--	--	0.055	0.074 (0.25)	--	0.042	0.94	0.0002	0.001	0.0014 (0.11)	0.0014	0.3	--	1.9	0.034	0.005	0.008
MEDIAN - RS01 (24/04/2023 - 20/05/2026)			7.3	87	40	<1	0.001	--	--	0.002	0.005	0.011	0.005	0.0038	0.0001	--	0.0082	--	0.00002	0.0002	0.00006	0.003	--	0.034	0.0098	0.002	0.001	0.001
SW13	25-Jun-26	NH2602707002	7.14	50	25	<1	<0.002	<0.1	--	<0.002	<0.005	0.025	0.007	0.004	<0.0001	<0.0001	0.0045	<0.01	<0.00002	<0.0002	0.00003	<0.0002	0.032	0.013	0.0024	<0.0002	<0.001	<0.001
SW13	24-Jul-26	NH2602985001	6.48	32.5	13	<1	<0.002	0.4	--	<0.002	<0.005	0.032	0.007	0.042	0.0005	<0.0001	0.0036	<0.01	<0.00002	0.0002	0.00006	0.0006	0.467	0.068	0.0012	<0.0002	0.002	<0.001

(##) acute compliance limit not to be exceeded

ATTACHMENT B – LINDIS RIVER ORC WATER QUALITY DATA EVALUATION

Memo

To: Cheryl Low, Environmental Manager, Matakanui Gold Ltd
From: Jens Rekker,
CC: Shay MacDonald, Senior Consent Planner, Otago Regional Council
Date: 11 March 2026
Subject: Instituting Water Quality Monitoring of Lindis River and Bendigo Creek

1 Introduction

At the 25 February 2026 workshop between Matakanui Gold and Otago Regional Council, the question of delineating the baseline and monitoring long-term surface water quality in the primary catchments downstream of the BOGP mining complex –

- During pioneering (Year 1)
- During operations (Year 2 – 13)
- Following mineral extraction closure (Active Closure)
- In Post-Closure.

1.1 Lindis River at Ardgour Road

Otago Regional Council maintains surface water quality monitoring on the Lindis River at the ORC Ardgour Road flow recorder site. This site is notable in being bounded upstream and downstream by dry riverbed during late summer low flow periods, as river water moves primarily by interflow within the hyporheic zone coarse sandy gravels of the Lindis Alluvial Ribbon Aquifer. By whatever mechanism, the subsurface flows persistently surfaces in the small river reach either side of the flow monitoring site, perhaps a low permeability geological feature beneath the perennial river reach.

ORC archives water quality on Ammonia-N, DRP, E. coli, Nitrate-N and pH for the Lindis at this site. Flow data is also available. Monthly monitoring has been instituted since September 2005, with gaps.

1.2 Lindis River at Lindis Peak

Earth Science New Zealand (formerly NIWA) maintains a flow monitoring and water quality monitoring at 'Lindis River at Lindis Peak', which is upstream of the lower river and mostly upstream of irrigation intakes that impose a substantial load upon the lower river during the irrigation season. ORC archives water quality on Ammonia-N, DRP, E. coli, Nitrate-N and pH for the Lindis at this site. Flow data is also available. Monthly monitoring that includes the above determinands has been instituted since September 2014.

1.3 Bendigo Creek

There is no independent water quality monitoring of the Bendigo Creek main stem. Proposed BOGP monitoring focuses on Clearwater Creek and the Rise & Shine Creek catchment affected by SRX and the RAS pit edge. It is proposed to institute a new main stem surface water quality monitoring site in lower Bendigo Creek upstream of points below which creek water infiltrates to the ground, and thence to the Bendigo Aquifer.

2 Historic Surface Water Monitoring

A location map of the combined surface water quality monitoring at Lindis Peak and Ardgour Road sampling sites is provided below in Figure 1.

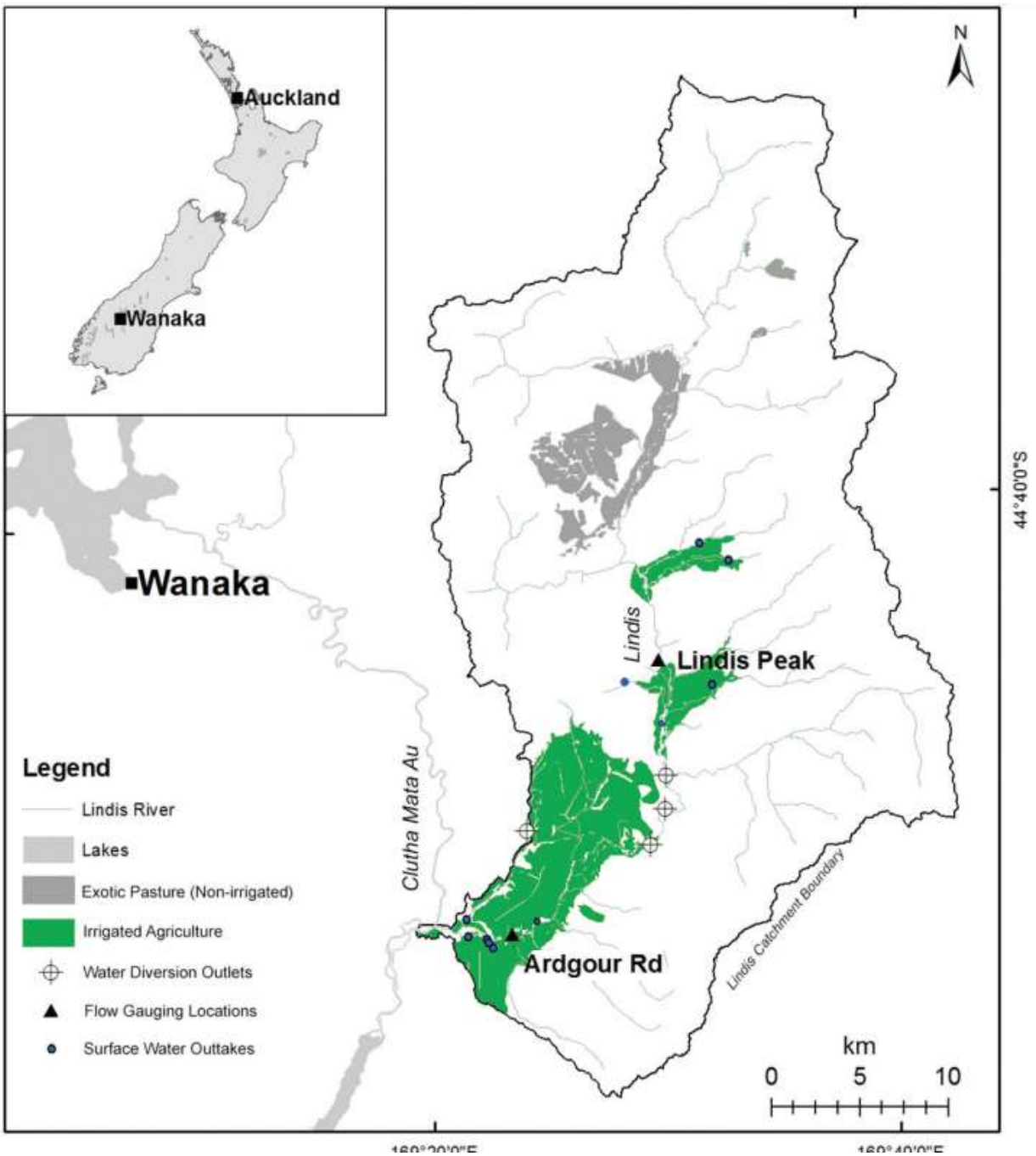

Figure 1: Location of Lindis River @ Lindis Peak, plus the downstream site of Lindis River @ Ardgour Road

Plots of the analytical results as time series are provided for each set of analytes in Figure 2, Figure 3, Figure 4, Figure 5, and Figure 6 for ammonia, DRP, nitrate, pH and E. coli, respectively. The data is presented as time series plots to display variability and any seasonal trends.

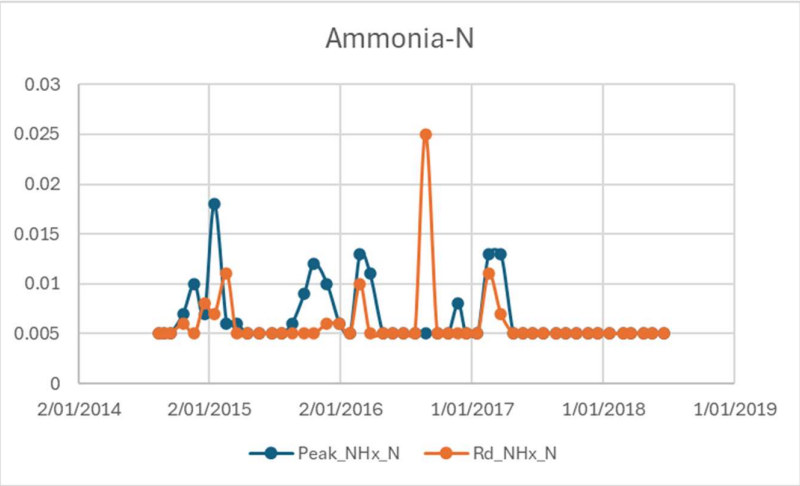

Figure 2: Ammoniacal nitrogen concentrations for Lindis Peak (Peak) and Ardgour Road (Rd)

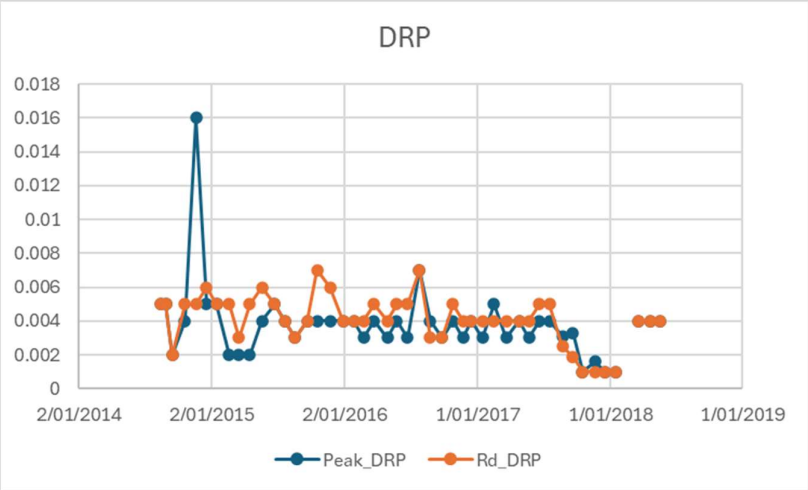

Figure 3: DRP concentrations for Lindis Peak (Peak) and Ardgour Road (Rd)

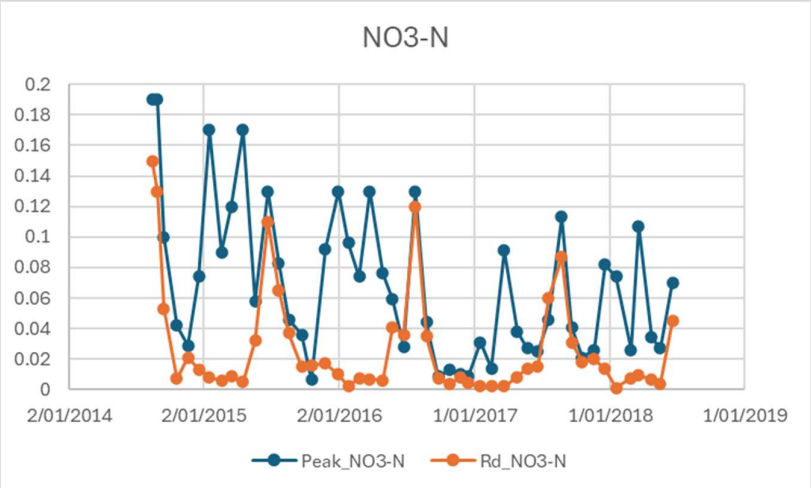

Figure 4: Nitrate nitrogen concentrations for Lindis Peak (Peak) and Ardgour Road (Rd)

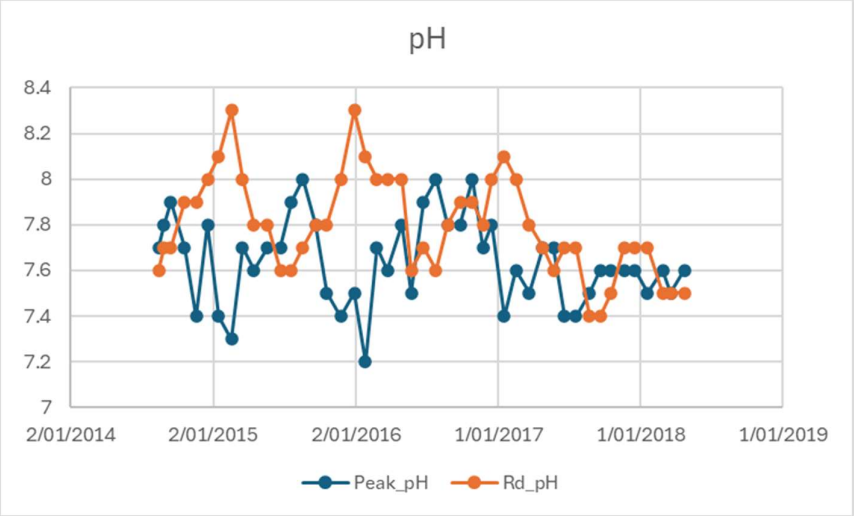

Figure 5: pH levels for Lindis Peak (Peak) and Ardgour Road (Rd)

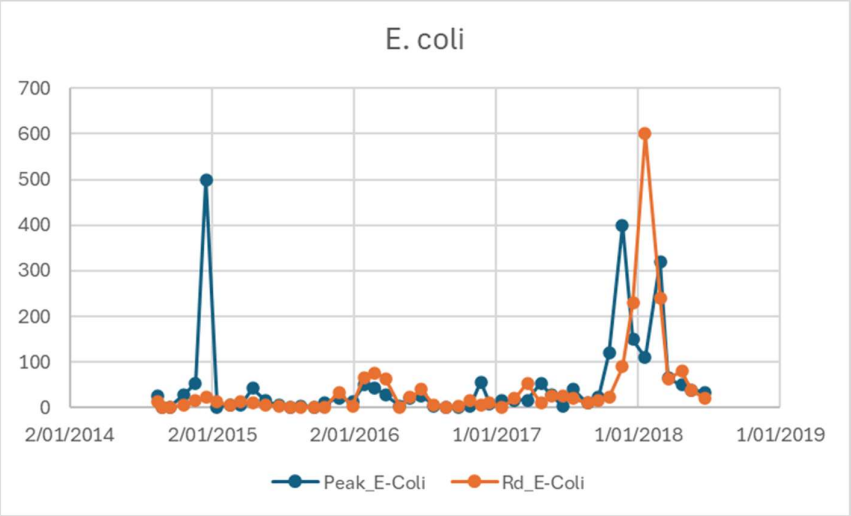

Figure 6: E. coli concentrations for Lindis Peak (Peak) and Ardgour Road (Rd)

The sole determinand that appeared to display consistent seasonal dependencies was nitrate nitrogen. Expanding on nitrate nitrogen plot in Figure 4, two plots were prepared of river nitrate nitrogen concentration alongside measured daily river flow at Ardgour Road monitoring site. Figure 7 plots a time series of nitrate at both Lindis Peak and Ardgour Road sampling site, alongside the measured mean daily flow rate. The distinction between the upstream schist rock dominated catchment of the Lindis Peak site and the downstream alluvium dominated catchment of the Ardgour Road site is probably the larger degree of groundwater-mediated baseflow at Ardgour road. Due to the large porous reservoir of alluvium immediately upstream of the flow and sampling monitoring site at Ardgour Road.

Figure 7 reveals nitrate nitrogen concentrations at Ardgour Road following the trend of flow rate, while the nitrate nitrogen concentration at Lindis Peak was markedly more volatile. Figure 8 reveals a strong pattern of dependence between flow rate and nitrate nitrogen concentration at Ardgour Road. It is inferred, based on studies in comparable braided river bed catchments, that nitrate accumulates in upstream alluvium and is flushed into surface water through to the river water column by high flows. Low flows are period of declining nitrate nitrogen concentration and depletion of the upgradient nitrate reservoir.

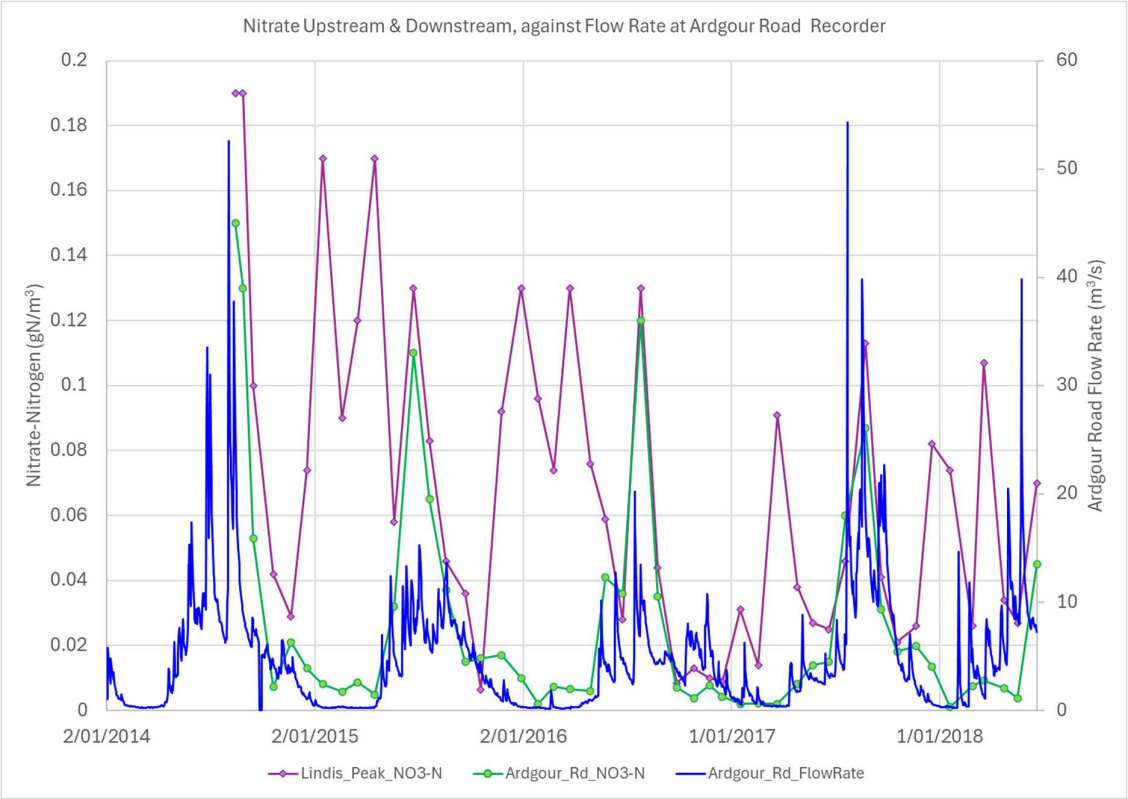

Figure 7: Trends in monthly nitrate-N at Lindis Peak and Ardgour Road daily mean measured flow rate

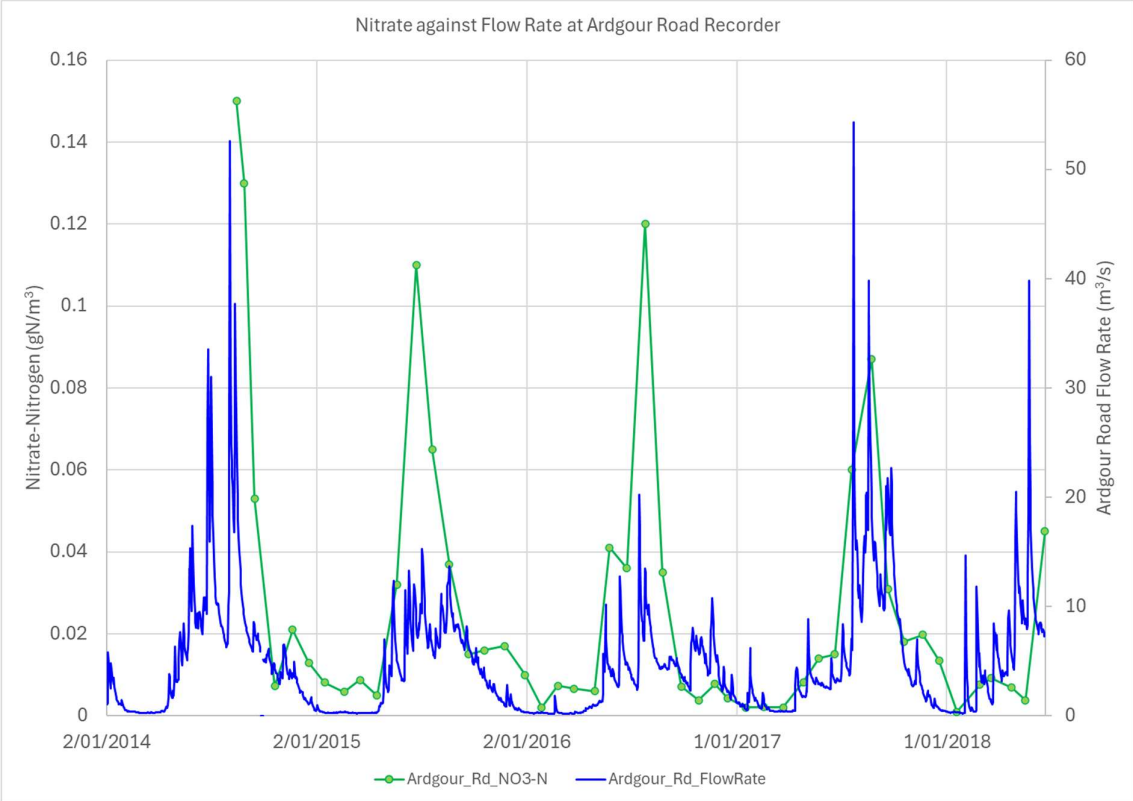

Figure 8: Ardgour Road monitoring site nitrate-N concentration and measured mean daily flow rate

Pastoral land use is the predominant inferred source of nitrate, which nitrifies in the soil profile and moves readily dissolved in soil water and groundwater to the Lindis Alluvial Ribbon Aquifer (LARA). The LARA ultimately discharges into the Lindis River before its confluence with the Clutha River, but particularly into the river bed immediately upgradient of the Ardgour Road monitoring site.

Dissolved inorganic nitrogen moves through the Lindis River primarily as nitrate, with ammonia about an order of magnitude lower in concentration and therefore mass load. This pattern is consistent with the mostly oxic geochemical characteristics of the gravelly alluvium making up the majority of upgradient subsurface vectors of catchment drainage. Nitrate nitrogen is generally associated with high velocity groundwater flow within high effective porosity, high permeability, and elevated dissolved oxygen content through the ground and hyporheic zone. Ammonia in groundwater is more generally associated with low velocity water flow within low effective porosity, moderate to low permeability, and suppressed dissolved oxygen content through the ground or wetlands.

3 Implications for Ongoing Monitoring

In the Shepherds Creek and lower Lindis River catchments, the BOGP operational and post-closure water quality risks include the multiple mode surface – subsurface – surface water vectors for potential contaminants such as arsenic, sulphate, nitrate, and other dissolved metals. The Lindis Valley water quality monitoring does not include sulphate but does include nitrate nitrogen. Other dissolved metals and metalloids have not been defined in existing monitoring.

Monitoring of nitrate has indicated that the baseline is influenced by volatility in the winter and spring season associated with high river flow rates and depletion with relative stability in concentrations associated with low river flows over the irrigation season and elevated evapotranspiration.

4 Proposal for Future Monitoring with Matakanui Gold involvement

4.1 Monitoring Sites

It is proposed that surface water monitoring with an expanded and focused list of analytes should be undertaken as follows:

1. Continuation of monthly monitoring of the Lindis River at Ardgour Road
    a. Consideration could also be given to the installation and maintenance of a continuous optical nitrate sensor for further spatial characterisation of ambient solute concentration trends.
2. Implementation of new monthly monitoring of Bendigo Creek at grid reference1314160 5018620 metres NZTM.

The Lindis River site would coincide with the ORC monitoring site in the lower river. The Bendigo Creek site would coincide with the Bendigo Station flow monitoring site that is a residual flow monitoring site for consent RM20.079.01 issued to Bendigo Station. This location coincides with a track crossing and ford, affording light vehicle access. The creek is considered to have perennial flow character at this proposed sampling site, which avoids the tenancy of lower reaches to lose creek flow during late summer.

Figure 9: Proposed surface water monitoring site at "Bendigo Creek monitoring station" (Bright, 2020)

Both proposed monitoring sites are collocated with existing flow measurement equipment. The ability to correlate the results of analysis with flow conditions is helpful in interpreting the concentrations or trends. Mass loads may also be calculated.

4.2 Analytes

The list of analytes would conform with the parameters and limits specified in Table 3 of the BOGP Water Management Plan.

4.3 Sampling Frequency

Monthly sampling and analysis frequency is proposed. As the basic objective of the surface water quality monitoring at Lindis River and Bendigo Creek is conjunctive assimilated catchment condition rather than trigger compliance limits, sampling frequency needs merely to characterise temporal trends in any seasonal fluctuation pattern. With such seasonal patterns characterised, the effects of upstream mining activities could be estimated in the context of downstream infiltration to groundwater. Both the Lower Lindis River and the lower Bendigo Creek contribute to groundwater sustaining irrigation galleries and bores operated during the 6 – 7 month irrigation season (October to April).

ENDS

Table 1: List of Analytes

Analyte
pH
Turbidity
Ammoniacal Nitrogen
Nitrate Nitrogen
Cyanide
Sulfate
Aluminium
Antimony
Arsenic
Cadmium
Chromium
Cobalt
Copper
Molybdenum
Zinc

Note: Green shading indicates overlap with ORC Lindis River monitoring analytes.

5 Reference

Bright, C. (2020). *Hydrological assessment for flow losses / gains—Bendigo Creek* (Technical Comment No. S15298). Landpro.