Stockton water management and assessment of effects on waterways and water users from the BPCP Stockton mining activities

Bathurst Resources Limited (including its subsidiary companies BT Mining Ltd, Bathurst Coal Ltd, and Buller Coal Ltd)

17 August 2026

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Glossary of Terms, Acronyms and Abbreviations

<table>
<tr><th>Term</th><th>Definition</th></tr>
<tr><td>Acid Mine Drainage / Acid and Metalliferous (AMD)</td><td>Acidic water generated from mining activities, particularly where sulfide minerals (like pyrite) are exposed and oxidise in the presence of air and water.
Acid Metalliferous Drainage (AMD) is a broad term describing acidity that originates from mining, generally called Acid Mine Drainage and natural geological sources. Though both apply to Stockton, most of the discussion in this report is focused on the Acid Mine (related) Drainage impacts.</td></tr>
<tr><td>Adaptive Management</td><td>A learning-oriented approach to managing environmental uncertainty associated with AMD. May change over time to reflect new information as it becomes available.</td></tr>
<tr><td>Adit</td><td>A horizontal or near-horizontal passage driven into a hillside to access underground mine workings, provide drainage, ventilation, or allow haulage. Millerton area at Stockton contains multiple adits into historic underground workings.</td></tr>
<tr><td>Bathurst</td><td>Bathurst Resources Limited, including its subsidiary companies Bathurst Coal Ltd and Buller Coal Ltd, and joint venture company BT Mining Ltd.</td></tr>
<tr><td>Betterment</td><td>The definition of 'Betterment' in the context of the BPCP as outlined in Bathurst (2026c) is described below:
The term Betterment has been applied to rivers in New Zealand (i.e. Waikato River) that have experienced long term anthropogenic contamination. It is recognised that managed improvement will take 3 generations (80-100 years) and require a collective, sustained, and sustainable effort between stakeholders.
Betterment is the process of active and progressive improvement of river health over the long-term.
The Betterment pathway for a given waterbody is marked by a combination of discrete events and long-term decay in AMD sources. Performance monitoring is used to track short- to medium-term water quality improvements along the Betterment pathway. These improvements are site / project specific, but contribute to overall long-term recovery.</td></tr>
<tr><td>Betterment Reference Values</td><td>Time-dependent 'Betterment reference (water quality) values' for acidity loads and acidity / dissolved aluminium concentrations modelled for the period 2010 – 2106 as presented in the Millerton AMD Water Management Report (Bathurst 2026a) to guide the long-term AMD management of Millerton Block waterways – Granity Stream, Miller Stream, Mine Creek and Twins Stream. The Betterment reference values assume that:
– Millerton Block opencast mining cease in 2010.
– Millerton Block underground workings remain at the 2010 extent and untreated.
– The load / concentration change from 2010 – 2106 is solely due to acidity decaying at a rate of 0.62% per year.</td></tr>
<tr><td>Buller Plateaux</td><td>A collective reference to the Stockton Plateau and Dennison Plateau.</td></tr>
<tr><td>Cleanwater</td><td>Runoff from undisturbed ground or rehabilitated areas where water quality is suitable for direct discharge into natural streams without treatment, and is comparable to natural background water quality.</td></tr>
<tr><td>Ecosystem</td><td>A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit (Cavanagh et al., 2018).</td></tr>
<tr><td>Future State</td><td>[redacted]</td></tr>
<tr><td>Macroinvertebrates</td><td>Report discusses aquatic macroinvertebrates. Macroinvertebrates are organisms without backbones (e.g., worms, snails, insects and crustaceans) which are visible to the naked eye (Cavanagh et al., 2018).</td></tr>
<tr><td>Millerton Block</td><td>AMD impacted waterways draining various catchments within the Millerton and northern Rockies mining areas at Stockton.</td></tr>
</table>

Term	Definition
Mining	The act of extracting a mineral existing in its natural state in land or a chemical substance from a mineral existing in its natural state in land.
Minewater	Runoff from disturbed, mining and historic areas where the water requires AMD correction and/or sediment capture prior to discharge into natural streams. Minewater is largely contaminated by coal fines (i.e. runoff from stripped coal and coal stockpiles). Can also be referred to as 'Mine Impacted Water'.
Mine Closure	The point at which Bathurst has ceased mining operations at Stockton and completed terrestrial rehabilitation of the site.
Opencast mining	This is the main mining method used at Stockton to extract coal. At Stockton, this involves the removal of topsoil and vegetation which are placed in specific terrestrial rehabilitation areas. The overlying rock is then broken up by drilling and blasting, removed and placed in nearby already mined areas ready for rehabilitation. An excavator then extracts the coal for processing.
[redacted]	[redacted].
Sludge	Comprised of physical sediments eroded from upstream mining activities and mineral precipitates formed during AMD treatment.
Stockton	Term used for Stockton Mine.
Stockton Mine	Mining Licence and Permit areas [redacted].
Stormwater	Runoff from disturbed areas where the water requires sediment capture prior to discharge into natural streams.
Tarn	Small mountain pond or lake, often glacial in origin. At Stockton, these include both natural and constructed tarns.
Term	35-year duration of the new resource consents sought through the Fast-track Approvals Act 2024 for the Buller Plateaux Continuation Project, covering a nominal period from 2027 - 2062.
TRONT	Te Rūnanga o Ngāi Tahu. Overarching iwi authority and as such they are consulted as matter of course on any major projects undertaken by Bathurst.
Turbidity	A measure of the amount of light scattered by suspended particles in a sample, typically reported in nephelometric turbidity units (NTU).
Water Infrastructure	Water management structures e.g. sumps, pumps, drains, dams, ponds, pipelines and monitoring equipment.
Waterway	Receiving environment surface water body. Generally, a stream or river. Distinct from the cleanwater, minewater and stormwater run-off into the waterways.
West Coast Regional Council (WCRC)	The local government authority for the West Coast region of New Zealand responsible for environmental management, including flood control, air and water quality, and pest control.

Acronyms and abbreviations	Definition
ACML	Ancillary Coal Mining Licence
Al	Aluminium
AMD	Acid Mine Drainage / Acid and Metalliferous Drainage
AMDI	Acid Mine Drainage Index
BCM	Brunner Coal Measures
BPCP	Buller Plateaux Continuation Project
BRL	Bathurst Resources Limited
Bathurst	BT Mining Limited

Acronyms and abbreviations	Definition
Ca	Calcium
CaO	Calcium Oxide
Cd	Cadmium
CFSF	Coal Fines Storage Facility
CHPP	Coal Handling and Processing Plant
~	Approximately
cm	centimetre
CMA	Crown Minerals Act
CML	Coal Mining Licence (for Stockton)
Co	Cobalt
Cr	Chromium
Cu	Copper
DCA	Millerton Drainage Control Adit
[redacted]	[redacted]
DOC	Dissolved Organic Carbon
EC	Electrical Conductivity
ELF	Engineered Landform
EOML	Stockton End of Mine Life at 2033
EPT	Ephemeroptera (Mayflies), Plecoptera (Stoneflies) and Trichoptera (Caddisflies)
ESE	Escarpment Extended (BPCP sub-area)
Fe	Iron
FTAA	Fast-track Approvals Act 2024
ha	Hectare(s)
km	Kilometres
LINZ	Land Information New Zealand
LLB	Limestone Leaching Bed
LOM	Stockton Life of Mine to 2033
LoP	Limit of Protection
L/s	Litres per second
LDP 1 & 2	Lime Dosing Plant (1 & 2)
LDS	Low Density Solids
m	metres
m^3/s	Cubic metres per second
MALF	7-Day Mean Annual Low Flow
MaPPS	Millerton and Plateau Protection Society Incorporated
MFS	Mount Fredrick South (BPCP sub-area)
MgO	Magnesium Oxide
MWM	Mine Waste Management
mm	millimetres

Acronyms and abbreviations	Definition
Mn	Manganese
Mg	Magnesium
mg/L	milligrams per litre
MoU	Memorandum of Understanding
MP	Mining Permit
MSR	Mussel Shell Reactor
N/A	Not Applicable
NAF	Non-Acid Forming
NELF	Northern Engineered Landform
Ngākawau ED	Ngākawau Ecological District
Ni	Nickel
NIWA	National Institute of Water and Atmospheric Research (now Earth Science New Zealand (ESNZ))
NTU	Nephelometric Turbidity Units
PAF	Potentially Acid Forming
PCE	Parliamentary Commissioner for the Environment
pH	Potential Hydrogen
RL	Relative Level
RMA	Resource Management Act 1991
SEMP	Stockton Environmental Management Plan
SWaMP	Stockton Water Management Project
TSS	Total Suspended Solids
UFL	Ultra Fine Limestone
UWHR	Upper Waimangaroa Haul Road (BPCP sub-area)
VDT	Vegetation Direct Transfer
WCRC	West Coast Regional Council
Zn	Zinc

Executive summary

Stockton Mine

Stockton coal Mine ('Stockton') has been owned and operated by BT Mining Limited since 2017, a joint venture between Talley's Energy Limited and Bathurst Resources Limited ('Bathurst'). Stockton is located on the West Coast of the South Island of New Zealand on the Stockton Plateau - Mangatini ki Ngākawau.

Stockton operates under a variety of water rights and associated resource consents that are scheduled to expire between 2026 and 2057. The current Stockton Coal Mining Licence (CML) and Ancillary Coal Mining Licences (ACMLs) will expire on 31 March 2027. If replacement authorisations cannot be obtained, BT Mining operations at Stockton will end in 2027.

Buller Plateaux Continuation Project (BPCP)

Bathurst (including its subsidiary companies BT Mining Ltd, Bathurst Coal Ltd, and Buller Coal Ltd) is seeking authorisations for the Buller Plateaux Continuation Project (BPCP) through the Fast-track Approvals Act 2024 (FTAA), including permits relating to water management under the Resource Management Act 1991 (RMA) for a 35 year term (covering a nominal period from 2027 – 2062).

The BPCP consists of five project sub-areas, one of which is Stockton. The Stockton sub-area timeline is:

- Operation phase mining until Stockton coal runs out: 2027 - ~2033.
- Receival / processing of coal and receival / disposal of potentially acid forming rejects from other BPCP sub-areas: 2027 - ~2042.
- Receival of Mussel shell sludge from ESC in Millerton: 2027 - > 2062.
- Land rehabilitation (physical works): 2027 - ~2046.
- Mine closure: 2046.
- Post-closure monitoring, [redacted]
- Continued AMD management: Likely beyond 2062.

This report was commissioned by Bathurst to summarise water management at the Stockton BPCP sub-area, with a focus on describing the effectiveness of current water management approaches and providing a summary of impacts on waterways.

A key aspect of the BPCP is the management of impacts from contemporary and historical Acid and Metalliferous Drainage (AMD), focused on mining related impacts on waterway quality and aquatic ecosystems.

Crown Liability

[redacted]. LINZ on behalf of the Crown has initiated a five-year monitoring and optimisation programme (commenced late 2025) to refine and enhance the long-term treatment performance for historic AMD sources at Stockton (The Treasury, 2025a).

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1 [redacted]

Current operations and impacts

Mining at Stockton commenced in 1896, initially involving underground operations that lacked modern environmental controls. It wasn't until the early 2000's following rapid expansion of mining operations and deteriorating water quality in the Ngākawau River that significant efforts began to address the environmental impacts from historic and contemporary mining, including impacts on waterways. The most challenging environmental issue is the impact of AMD from historic underground and contemporary opencast mining on waterways - especially aquatic ecosystems.

Untreated AMD results in lowered pH as low as 2.5 (though many Stockton waterways are naturally acidic and as low as 3.4), elevated metal concentrations, and elevated turbidity which are detrimental to aquatic ecosystems. As a result, many AMD impacted waterways, though not all, are generally devoid of aquatic fauna and have low ecological values.

Stockton water management faces unique challenges due to the high rainfall, historic mining impacts on water quality, underground workings and fires. Despite this, over the past 25 years, water management efforts, initiated by Solid Energy New Zealand Ltd and continued and improved on by Bathurst, have led to improvements in downstream water quality and enhanced aquatic ecosystems in many waterways, including the Ngākawau River. With improved water quality comes improved aquatic ecosystem health. [redacted]

The key water management approaches include (1) excavation and removal of underground workings, (2) active and passive treatment of AMD, (3) land rehabilitation (including Vegetation Direct Transfer), (4) capping of potentially acid forming waste rock, and (5) a network of diversion channels, sediment ponds, and containment bunds to manage surface water flow, to prevent cleanwater from mixing with contaminated runoff, and to reduce erosion.

Bathurst also has an extensive environmental monitoring network to track compliance with consent conditions as well as voluntary measures to assist day-to-day site management of water and support mining operations and community expectations. Overall, Bathurst has a very high level of compliance in a very challenging environment. Where non-compliances have occurred, the actions taken to achieve compliance have resulted in improved environmental outcomes.

Future operations and impacts with and without the BPCP

An assessment of the future water quality and associated impacts on aquatic ecosystems and water users was conducted through to the year 2106 (80 years from present). The assessment considered the impacts of the BPCP and also evaluated a scenario where mining and water treatment activities cease in 2027.

Without the BPCP

Without the BPCP assuming no AMD treatment beyond 2027, there would be significant impact to aquatic ecosystems due to ongoing discharges from historic mining activities. Many waterways, including the Ngākawau River, would change from supporting aquatic life, to a moderate or severely AMD impacted state, and generally devoid of aquatic life. This would occur unless the Crown steps in to undertake on-going water quality management to same level as is currently be undertaken.

With the BPCP

The BPCP and its proposed water management initiatives will help to reduce the uncontrolled legacy and contemporary AMD impacts. The project aims to improve water quality so that aquatic ecosystems can return to their natural state and mahinga kai can be safely gathered. The key initiatives include:

– Updated and new environmental management plans including the Stockton AMD sludge management and the Millerton AMD management plan. The Millerton AMD management plan underpins much of the future water quality improvements in waterways draining the Millerton Block (most AMD impacted catchment at Stockton) and subsequent improvements in the quality of water in the lower Ngākawau River.

– Continued opencast mining that will result in the removal of historic underground and opencast mines which are the main AMD sources to waterways.
– Ongoing land rehabilitation and the use of modern overburden engineered landforms (ELFs) to cap acid forming overburden waste rock produced from opencast mining.
– Separation of contaminated water ('minewater' and 'stormwater') from 'cleanwater' around active and rehabilitated pits.
– Post (2046) mine closure AMD treatment in all major surface water catchments using the existing Mangatini and McCabes Sumps and the proposed future MW16 Sump at Millerton.

These and other initiatives will improve the water quality in many waterways, including the lower Ngākawau River (largest Stockton waterway) changing from a recovery to recovered aquatic ecosystem state. As well, sections of the largest and key waterways within the Mangatini catchment (Mangatini Stream) and St Patrick catchment (St Patrick Stream) are expected to improve from an impacted state (one generally devoid of aquatic life) to a recovered or recovering state that supports aquatic life within the next 35 - 80 years.

Under the BPCP, the Millerton Block (currently the most AMD impacted area of Stockton) waterway aquatic ecosystems in Mine Creek, Miller Stream and Granity Stream will move towards a state of recovery within 80 years. These ecosystems may reach the recovery state; however, this will depend on the outcomes of discussions of additional AMD management through the Crown led AMD management plan that is being prepared over the next five years, as discussed in The Treasury (2025a). The exception is the coastal reach of Twins Stream, which is expected to improve to a recovered state.

Though continued opencast mining as part of the BPCP will result in the removal of historic underground workings (a major source of AMD to waterways), some AMD sources – largely from underground workings will remain post closure both within and outside the proposed Stockton consent area. The Crown (via LINZ) management of all remnant historic underground workings outside the opencast disturbance footprint and proposed consent boundary are not included in the BPCP. This will require multi-party collaboration from a range of stakeholders including Ngati Waewae, the community, Millerton and Plateau Protection Society Incorporated (MAPPs), Department of Conservation (potential AMD treatment infrastructure on Department of Conservation administered land) and councils. The Crown led process that is underway is the mechanism to provide an agreed long term AMD solution between all parties and is expected to result in future consents to optimise AMD treatment systems, which will address these and other historic AMD sources downstream.

In summary, continuation of BT Mining operations beyond 2027 will enable further removal of AMD sources and continued improvements and development of water treatment infrastructure that will ultimately lead to better long-term water quality outcomes and reduced future risk for the Crown and other parties.

Future objectives, strategies and recommendations

A focus for Bathurst mine planning is an 80 to 100-year (three generations) water quality improvement programme that will be carried out in partnership with the Crown and Iwi. During this time, focus for many BCM streams is on recovery from an impacted state rather than protection of an otherwise healthy biota. Mine planning requires water quality thresholds that represent the beginning of the water quality recovery zone to guide remediation, rather than a protection focused threshold that will become a consideration in the future as recovery progresses (Instream, 2026). Stockton also contains streams currently not affected by mining which require protection. Over time, the ultimate objective is waterway improvement that enables the gathering of mahinga kai.

Bathurst is committed to a programmed approach to infrastructure projects intended to improve water quality.

Regional water-related resource consents (water and discharge permits) are being sought for the ongoing operation, maintenance, rehabilitation and eventual closure of Stockton. Bathurst seeks:

– Alignment of future consent expiry times and monitoring for compliance where possible for the life of the BPCP.
– Review periods every 5 -10 years to reassess and adjust consent conditions and monitoring as necessary.
– Alignment of new consents with the current low-density sludge (RC06206) and mussel shell reactor (RC11138) consents where appropriate.
– New consent compliance limits for selected waterways.

A water monitoring strategy for the life of the BPCP is proposed so that incremental changes in waterway quality and aquatic ecosystem state can be tracked over time, reported and tested against thresholds. The monitoring will include both surface water and groundwater. The proposed monitoring sites fall into three types, 1) Compliance, 2) Performance and 3) Reference.

Both the compliance and performance monitoring sites inform the performance of Stockton water management initiatives under the BPCP. The Compliance Sites on critical waterways will ensure that recent improvements in water quality are maintained. The Performance sites (that have no compliance limits) are proposed for those waterways that would be assessed against a moving betterment trajectory over time.

Reference monitoring Sites are those in a natural state and not impacted by mining. These sites will be used to identify whether any changes at the Compliance and Performance Sites are the result of Stockton mining activities or from broader variation and changes in background conditions.

Aquatic ecosystem assessments are proposed on a six yearly basis at water quality Impacted and Recovering sites, but on a 3-year rotation at water quality Recovered sites, such as NR on the Ngākawau River as per the monitoring format described in Instream (2026).

Other future monitoring is also being proposed. A notable one includes the annual sediment surveys on the Ngākawau River estuary to help to monitor metal accumulation and inform environmental impacts associated with resource consent RC06206 that regulates the discharge of low-density solids from Mangatini Sump into Mangatini Stream. [redacted]

Limitations and primary references

This report is subject to, and must be read in conjunction with, the limitations set out in section 1.7 and the assumptions and qualifications contained throughout the report.

The primary references for this report are listed in section 1.9.

1. Introduction

1.1 Bathurst Resources and BT Mining

Bathurst Resources Limited (BRL, or 'Bathurst') (including its subsidiary companies BT Mining Limited, Bathurst Coal Ltd, and Buller Coal Ltd) is currently New Zealand's largest coal producing company and a 65% joint venture owner of BT Mining Limited (BT Mining) with the Talley's Energy Limited. BT Mining owns and manages the Stockton Mine (Stockton). All BRL mining operations are located within South Island West Coast, Southland, and Waikato regions of New Zealand. Metallurgical coking coal from Stockton is exported primarily to international steel makers. The primary markets being in India, Japan and South Korea.

1.2 Stockton Mine

Stockton is located on the Stockton Plateau - Mangatini ki Ngākawau – approximately 20 kilometres (km) northeast of Westport on the South Island's West Coast (Figure 1-1). Stockton (mined under Coal Mining License (CML) 37150) is part of the Buller Coalfield that also includes Cypress Coal Mine, Cascade Coal Mine, Escarpment Coal Mine, and historic workings on the Denniston Plateau. Stockton is the largest opencast coal mine in New Zealand, comprised of multiple pits, engineered landforms and rehabilitated areas over approximately 2,500 hectares (ha). The active mining area is 787 ha.

Figure 1-1 Location of Stockton and Coal Mining Licence 37150 (in grey)

The Stockton CML, within which the mine is located, is surrounded almost entirely by Crown land administered either by the Department of Conservation or administered by Land Information New Zealand (LINZ) in the Upper Waimangaroa Valley area. Stockton encompasses mining both within the CML and the Upper Waimangaroa Valley (Cypress Mine, which operates under a separate mining permit).

1.3 Mining extent and permits

Figure 1-2 provides an overview of mining areas on the Stockton Plateau and presents the mining licences and permits. The areas are broken into blocks (Figure 1-2). The Millerton Blocks (within CML 37150) are the largest of Bathurst's current mining operation. This block was previously mined by the Westport Coal Company, the Crown, and Crown-owned entities using underground methods. Bathurst now mines the block using open pit mining methods.

Smaller mining operations occur in other locations across the CML, although most of this activity is anticipated to be completed by 2033. An exception to this is the Rockies area (west of the Millerton Block) and Mine Creek area (within part of the Millerton Bock), which are anticipated to be mined in the future with overburden rock to be placed in Millerton.

Inland from the CML is the Cypress mine which sits within the mining permit 41515 area. Solid Energy obtained the required permits to mine Cypress in 2005. Development commenced in 2011 and mining in 2013. Bathurst anticipates that mining in this area will be ongoing for ~10 years.

1.4 Historical context

Environmental impacts from mining on water quality stem largely from Acid Mine Drainage (AMD). Smaller impacts on water can result from suspended sediment (activities such as coal fines storage and run-off from disturbance areas) and changes to water quantity (water takes and diversions). A full description of the legacy AMD and history of AMD management at Stockton is provided in the *History of AMD Management and Proposed Future Management* report by Bathurst (2026c).

1.4.1 Acid Mine Drainage

Acid Mine Drainage (AMD) occurs when the iron sulfides in rock material unearthed by mining activity interact with water and air and oxidize. The process creates sulfuric acid, a corrosive acid capable of breaking down surrounding rocks, which can cause metals to enter and eventually dissolve into surrounding waterways (Bathurst, 2026c). Acid Metalliferous Drainage includes both mining impacts and non-mining sources. A major non mining source at Stockton occurs from the Brunner Coal Measures (BCM) acid that is naturally released into some waterways.

AMD from mining will continue from uncovered Potentially Acid Forming (PAF) rock material until such time as the process is complete or the rock material is encapsulated in such a way that oxygen and/or water ingress is excluded or reduced to very minimal levels. Mining sources of AMD at Stockton in order of largest to smallest are listed below.

– Historic underground and open cast coal workings (by far the largest source~80%) located within and outside the Stockton Coal Mining Licence areas.
– Current waste rock from open cast mining.
– Historic underground coal fires and recent fire suppression works that create secondary AMD.

A timeframe of 100 years is commonly applied to this process where the rock material is left exposed and AMD declines over time (Bathurst, 2026c). For Stockton, Gandy & Younger (2007) estimated a specific AMD decay rate of 0.62% per year.

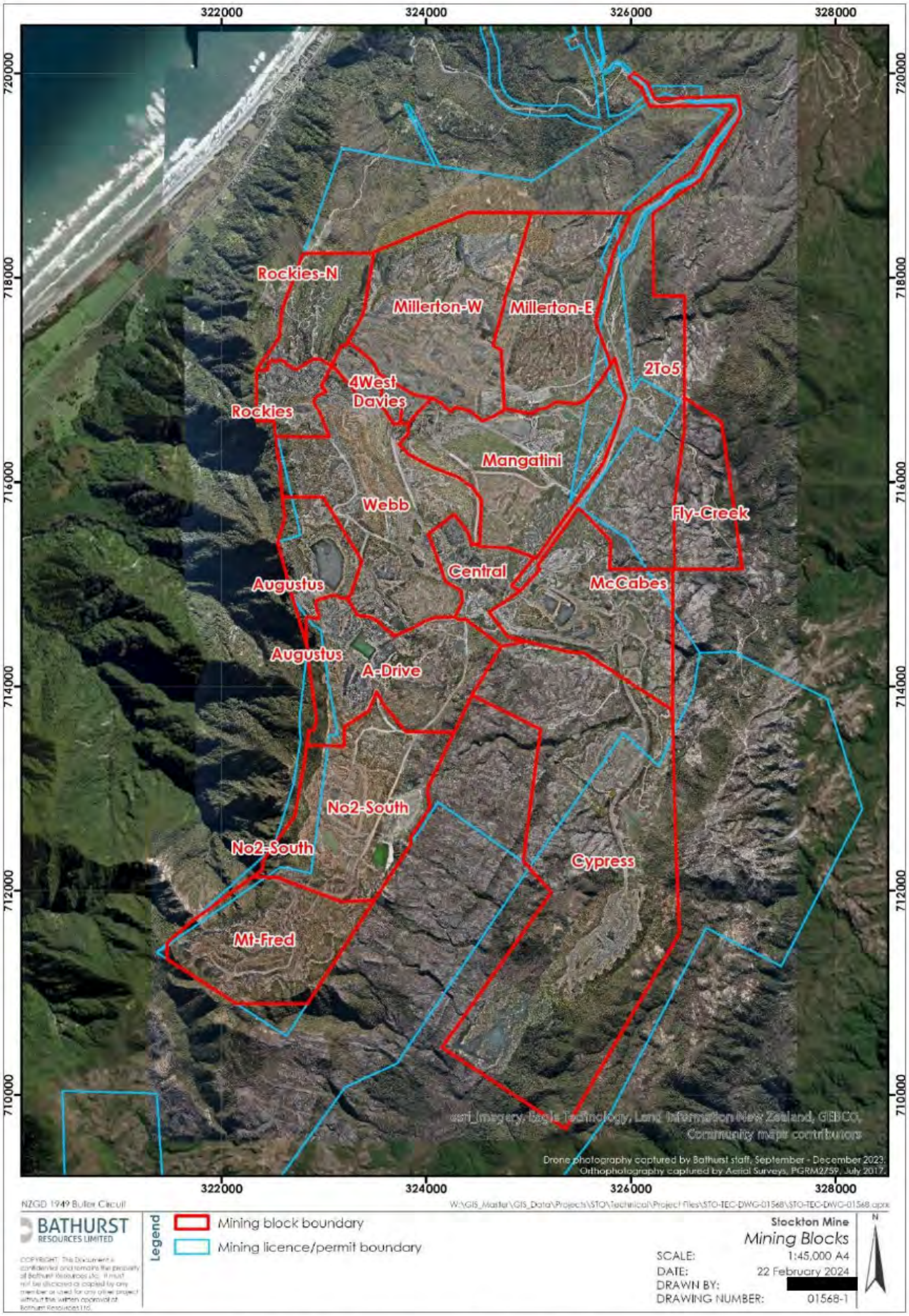


Figure 1-2 ***Stockton mining sub-area blocks (source: Bathurst, 2025c)***

1.4.2 Stockton mining history

Mining on the Stockton Plateau began in 1896 with the Westport-Stockton Coal company. Initially this was limited to underground operations in the Millerton area, before moving to other areas on the Stockton Plateau between 1908 and 1969. Initial mining lacked modern environmental controls to manage AMD. Remnants of these early practices – such as underground fires, hot rock, heated coal, and combustion gases – still pose risks and must be carefully managed before and during current mining operations. An initial fire started by spontaneous combustion in 1926 in the Millerton area and multiple fires have continued to burn at various locations in the historic Millerton workings since that time (Bathurst, 2026c). The extent of underground mining is shown in Figure 1-3.

In 1944, the transition to opencast mining began under the ownership of State Coal Mines and marked the start of large-scale development. In 1987, the Crown established Coal Corporation of New Zealand Limited. Its name was changed in 1997 to Solid Energy New Zealand Limited (referred to hereafter as Solid Energy).

It was not until the early 2000s, under management of Solid Energy that significant efforts began to address the environmental and AMD impacts from historic mining and to manage the impacts of ongoing operations. This resulted in the implementation of various water management initiatives to improve waterway quality with a focus on the Ngākawau River. In 2008, the PCE (2006) findings showed that Solid Energy's efforts to manage the impacts of AMD since 2005 had resulted in significant improvements. [redacted]

[redacted]

[redacted]

[redacted]

1.4.4 The Treasury Business Case

In 2024, a Single Stage Business Case was completed to identify a preferred long-term solution for the management of AMD by the Crown and the transitional arrangements required for managing AMD before BT Mining leaves the site. The project was led by The Treasury, which engaged Tregaskis Brown and Tonkin and Taylor Limited (2024) to complete the business case, supported by an Expert Advisory Group (The Treasury, 2025b).

From this project, four potential long-term AMD management approaches were identified. Of these, an Enhanced Base Case option was recommended. The Enhanced Base Case option includes:

– The Base Case option representing the current AMD management approach in use by BT Mining and assumption of a 'Mine Creek' Sump in place before the mine is closed.
– Additional treatment of minor waterways that receive historical AMD discharges for which no resource consent has been sought or granted, and for which the Crown could be held accountable once it resumes ownership of the site and responsibility for compliance.
– Passive treatment (i.e. mussel shell reactors) and small-scale active treatment for additional, smaller waterways.

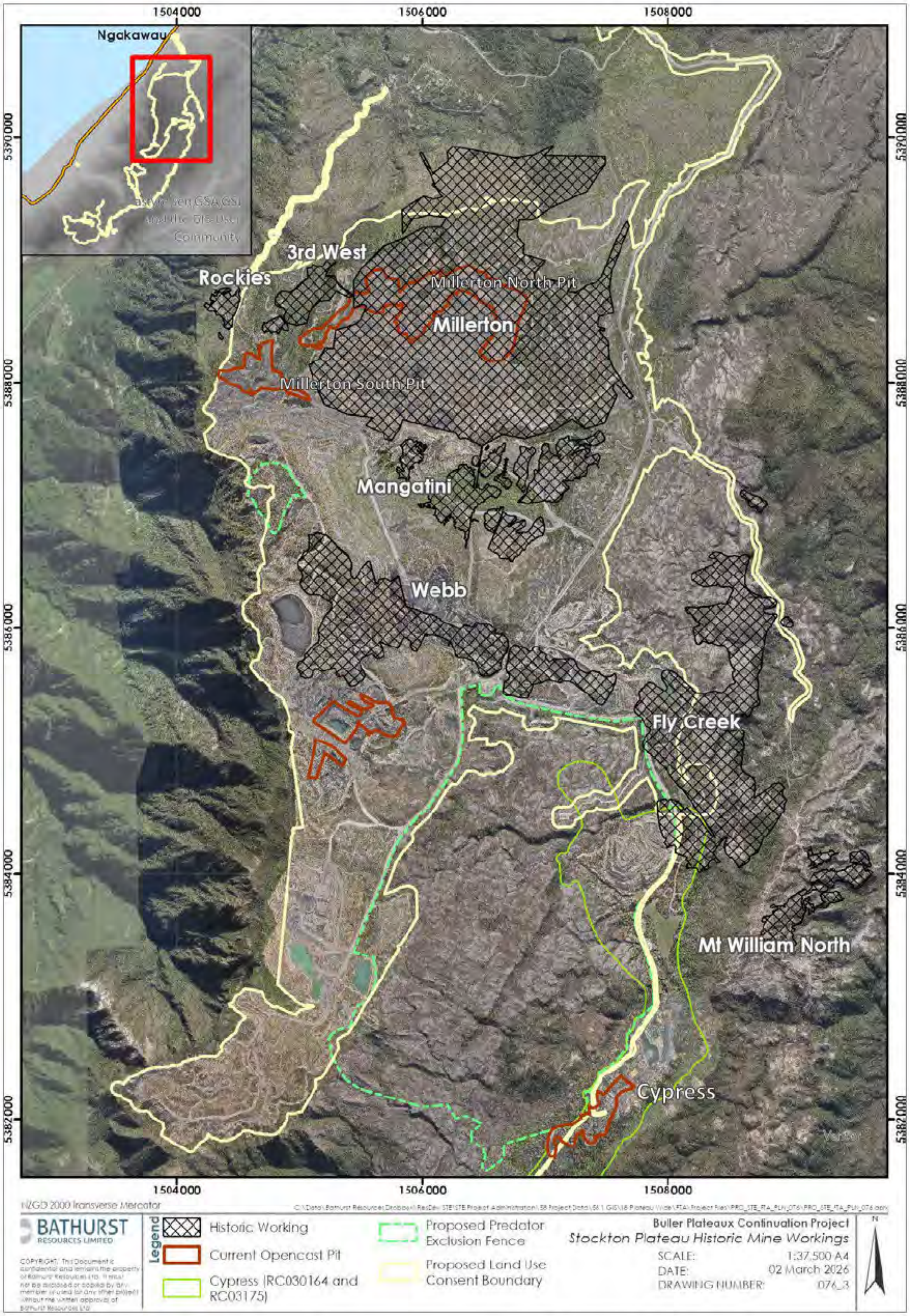


Figure 1-3 ***Extent of underground and current opencast mining at Stockton and Cypress***

Key points

- Approximately 80% of the AMD loads to Stockton Plateau waterways are from historic mining undertaken prior to BT Mining taking over Stockton. The responsibility for managing and treating historic AMD resides with the Crown.
- The Treasury Business Case on Stockton AMD management that was prepared in consultation with Ngati Waewae as partners and involved an expert panel of AMD management experts concluded that the current practise of treating AMD at Stockton is the best practicable option.
- Optimisation for the future long-term treatment of AMD is already underway and being led by LINZ (The Treasury, 2025a). This is likely to involve capturing and treating historic AMD from underground workings downstream of the FTA application and some AMD that is outside of CML or in the MAPPS area where negotiated access will be required.
- The long-term optimal AMD management implementation will require collective agreement and support from a range of stakeholders and partners including Ngati Waewae, Crown, LINZ, Councils, community, Millerton and Plateau Protection Society Incorporated (MAPPs) and Department of Conservation.
- The complexity of treating all historic and current AMD produced over the past 130 years of mining has resulted in the development of a progressive improvement approach to ensure a return of mauri to the downstream waterways over the next three generations (~80 years).

1.5 Buller Plateaux Continuation Project (BPCP)

Bathurst is seeking resource consents through the Fast-track Approvals Act 2024 (FTAA) for the Buller Plateaux Continuation Project (BPCP). There will be several unique phases throughout the life of BPCP with AMD related resource consents expected to be transferred from Bathurst as part of the handover to the Crown sometime between 2047 and 2062.

A key objective of the BPCP is to re-consent the existing infrastructure and mining operations at Stockton and provide access to additional mining areas as the coal resources at Stockton are depleted. The BPCP proposes to mine approximately 20 million tonnes of coking coal across the Buller Plateaux using existing infrastructure and facilities at Stockton to support and extend the mine life of the current Stockton operations. The BPCP is broken into five key project sub areas shown in Figure 1-4.

- Stockton (including the Ngākawau Rail Loadout and associated aerial ropeway).
- Escarpment Extended (ESE).
- Mount Frederick South (MFS).
- Upper Waimangaroa Haul Road (UWHR) (transport corridor).
- Cypress.

This report focuses on the Stockton sub-area (Figure 1-4). The other four sub-areas are discussed where cumulative impacts are addressed. The proposed consent and disturbance areas for the Stockton sub-area are shown in Figure 1-4 and Figure 1-5. The existing Cypress Mine consent boundary is shown for context (solid green outline).

The Stockton sub-area covers existing mining operations within the Stockton CML. This includes ancillary activities provided for under the Stockton Ancillary Coal Mining Licence (ACML), including the Coal Handling and Processing Plant (CHPP), the Coal Aerial Ropeway, and Ngākawau Rail Loadout. Currently, over 400 ha of disturbance is fully rehabilitated. In the Stockton sub-area, Bathurst proposes to mine additional areas in the north of the Stockton Mine, continue using the existing infrastructure and facilities, carry out further sourcing of granite material in the A Drive quarry, place PAF waste rock from other BPCP sub-areas, and develop three additional Coal Fines Storage Facilities (CFSF).

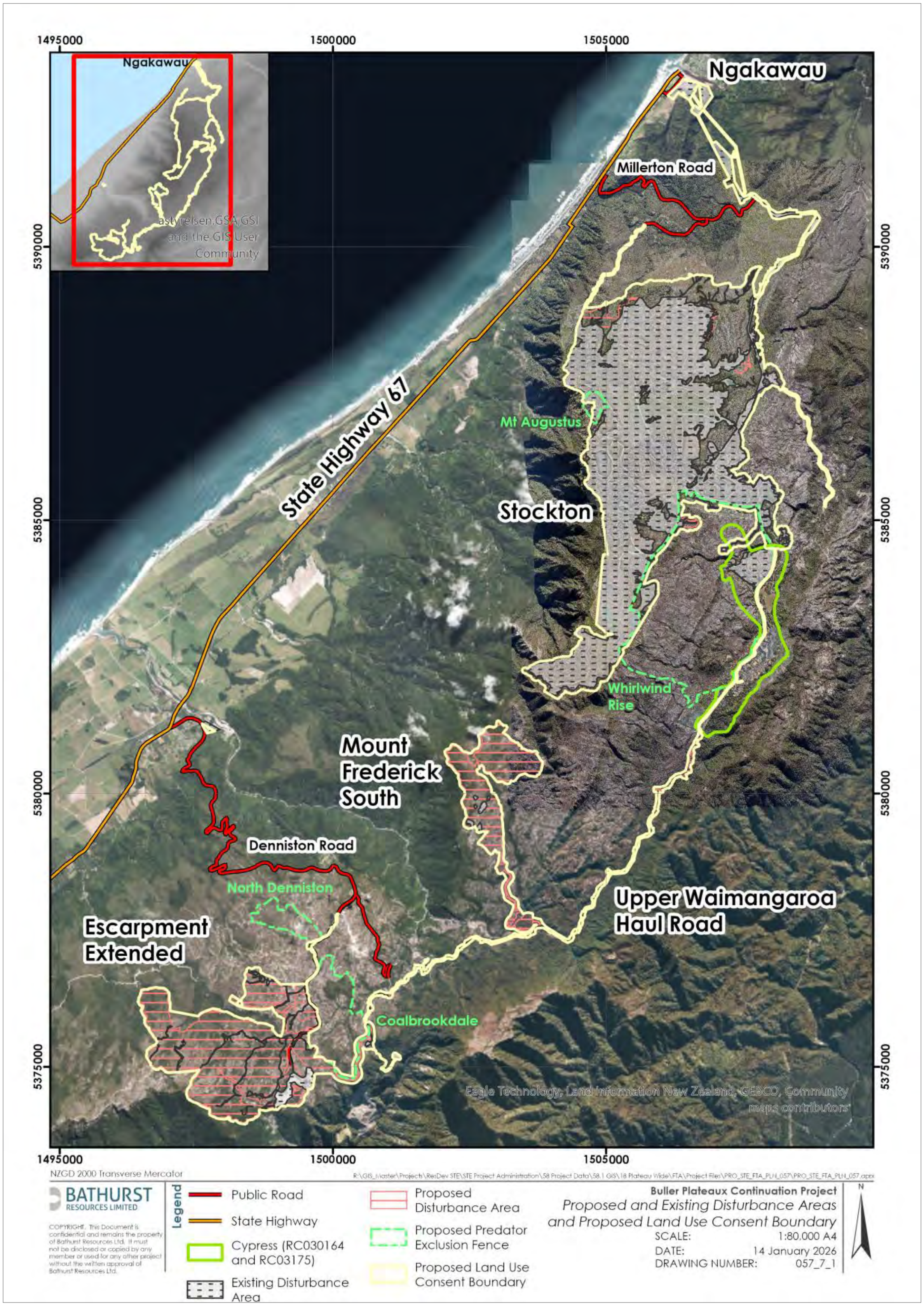


Figure 1-4 ***Proposed disturbance and consent areas across the BPCP***

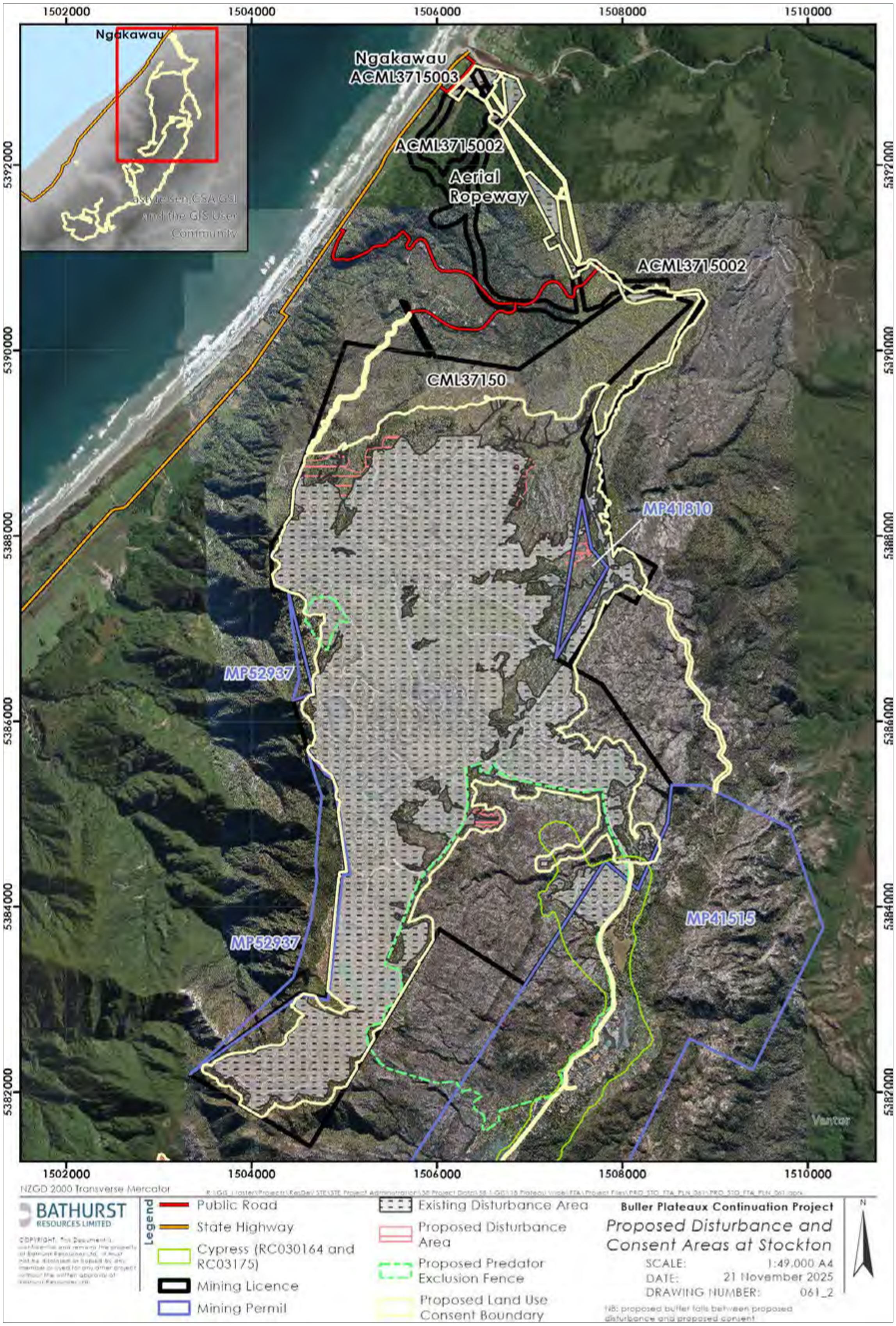


Figure 1-5 ***Proposed disturbance and consent areas within the BPCP Stockton sub-area***

Coal mined in the ESE and MFS sub-areas will be transported to Stockton via the UWHR for processing, blending or washing as required at the Stockton CHPP, and then transported via the existing aerial ropeway to the Ngākawau Rail Loadout. Coarse rejects from ESE and MFS will go to Stockton Engineered Landforms (ELF) and fine rejects to the Stockton coal fines storage facilities. The rejects are a combination of potentially acid forming (PAF) and non-acid forming (NAF) material and will be dealt with accordingly through Stockton rehabilitation procedures and active / passive water treatment. The transport of coal and rejects to Stockton will cease in ~2042.

A full description of the BPCP project is provided in the FTAA application.

1.6 Purpose and scope of this report

Historically, Stockton operates under a variety of water-related resource consents with differing expiry dates spanning from 2027 to 2057. This report supports Bathurst's application for new water related consents for the BPCP under the FTAA, including the renewal of some existing resource consents with pending expiry dates. Commissioned by Bathurst, this report summarises Stockton's water management framework, evaluates the effectiveness of current and proposed practices, and outlines their environmental implications. The scope includes descriptions of the:

- Environmental setting.
- History of mining at Stockton.
- Current water management infrastructure and plans, water quality improvements over time.
- Current water related resource consents, associated monitoring data and compliance records.
- Current impacts on aquatic ecosystems and water users (groundwater and surface water).
- Proposed future mining activities within the Stockton sub-area and associated water management approaches.
- Future influences on water quality and impacts to aquatic ecosystems and water users.
- Future monitoring strategies.
- Recommended consent conditions.

1.7 Limitations

This report: has been prepared by GHD for Bathurst Resources Limited (including its subsidiary companies BT Mining Ltd, Bathurst Coal Ltd, and Buller Coal Ltd) (together Bathurst) and may only be used and relied on by Bathurst for the purpose agreed between GHD and Bathurst Resources Limited as set out in Section 1.6 of this report. Without limiting the foregoing, this report is intended to support Bathurst Resources Limited's application under the Fast-track Approvals Act 2024 and may be relied upon by the Expert Panel and relevant administrating agencies for the purposes of assessing the application.

GHD otherwise disclaims responsibility to any person other than Bathurst arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

GHD has prepared this report on the basis of information provided by Bathurst and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

1.8 Exclusions and assumptions

This report is subject to the following assumptions and exclusions:

Exclusions:

- Cypress, MFS, ESE and UWHR sub-areas, except where needed to discuss cumulative impacts on Stockton.
- Assessment of economic impacts, impacts on iwi and community wellbeing.
- [redacted]
- Review and quality assurance of Bathurst supplied data and external consultant reports.

Assumptions:

- The data and reports obtained from Bathurst, the WCRC and other sources are reliable and without error.

1.9 Primary information

Due to the extensive operations and longstanding history of the Stockton Mine, many references and information sources were used to prepare this report. All references are provided in Section 6. The primary information sources are listed in Table 1.1 and included in Appendix E - Appendix J.

Table 1.1 Primary references

Subject	Reference	Report Appendix
BPCP project description	– Within the FTAA application.	Within the FTAA application
Stockton Acid Mine Drainage	– *Acid Mine Drainage. History of AMD Management and Proposed Future Management* (Bathurst, 2026c).	Appendix E
Waterway quality and management –past and future under the BPCP	– Mangatini and St Patrick catchments: • *Millerton Water and AMD Management Report* (Bathurst, 2026a) • *Stockton 80-year Water Quality Forecast* (Bathurst, 2026b).	Appendix F Appendix G
AMD sludge management	– Stockton Operational AMD Sludge Management. PLO-50126. (Bathurst, 2025b).	Appendix H
Stockton aquatic ecosystems – Current and future impacts from the BPCP	– *Stockton Aquatic Ecology: History, Thresholds and Long-Term Management* (Instream, 2026). – *Ngākawau fish survey 2025*. Prepared for Bathurst-Talleys (InStream Consulting, 2025).	Appendix I
Stockton groundwater – Current and future impacts from the BPCP	– *Hydrogeology of the Stockton Area and the Assessment of Effects on Groundwater from BPCP Stockton Mining Activities* (GHD, 2026).	Appendix J
Stockton waterway hydrology – Current and future impacts from the BPCP	– *Hydrological Assessment* (MWM, 2026).	-
Water related consents and compliance monitoring	– Annual consent compliance monitoring reports (previous three years).	-
Current Stockton water management plans	– Stockton Mine Water Environmental Management Plan STO-ENV-PLN-013 (Bathurst, 2026g). – Stockton AMD Management Plan STO-ENV-PLN-016. (Bathurst, 2026h). This includes the Mangatini Sump Management Plan (GHD, 2024).	-

Subject	Reference	Report Appendix
Proposed Stockton water management plans	– *Millerton Water and AMD Management Plan* (Bathurst, 2026f)	-
The Treasury Business Case	– Key documents available online from **https://www.treasury.govt.nz/publications/information-release/stockton-acid-mine-drainage** – Includes The Treasury (2025a, 2025b)	-

2. Existing environment

2.1 Climate

Stockton experiences a harsh and challenging climate. Rainfall on the Stockton Plateau is significantly higher than other parts of New Zealand, with between 5 to 6 metres (m) of rain falling a year, and frequent storm events that can produce more than 200 millimetres (mm) rainfall per day. Rainfall greatly exceeds the mean annual evapotranspiration of ~1.4 m (Westport Township) (Macara, 2016). Snowfall is common, especially during winter and spring. The mean annual temperature at Stockton is 9°Celcius (C), with mean monthly temperatures range from 13°C in January to 4°C in July.

2.2 Topography

Stockton Mine is located on the Stockton Plateau, at an altitude ranging from ~500 m to 1,000 m Figure 2-1. The Stockton Plateau, located within the Papahaua Range on New Zealand's West Coast, features a rugged and elevated landscape that plays a significant role in shaping both its natural environment and mining operations.

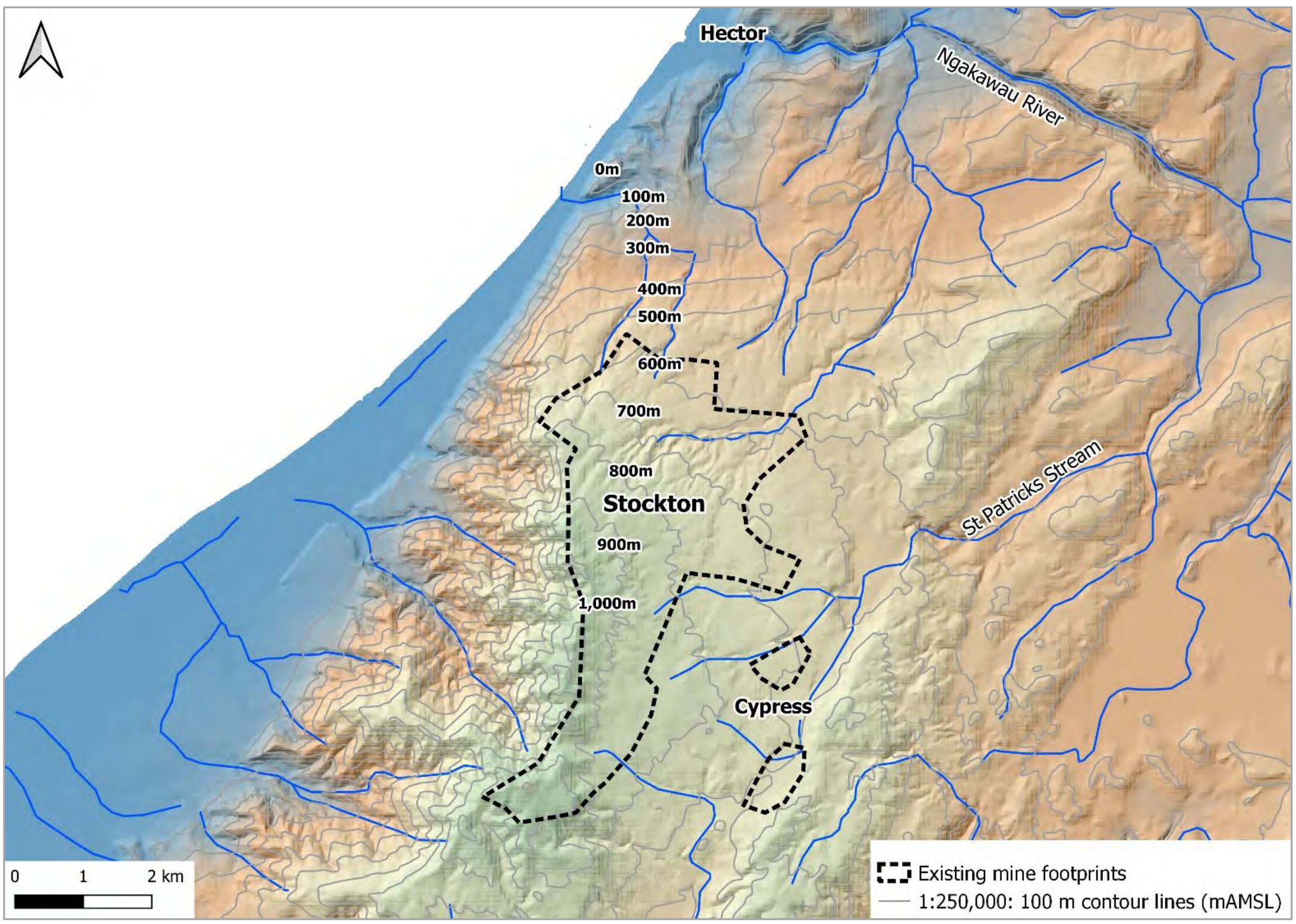


Figure 2-1 Pre-mining topography and mining areas at Stockton and Cypress

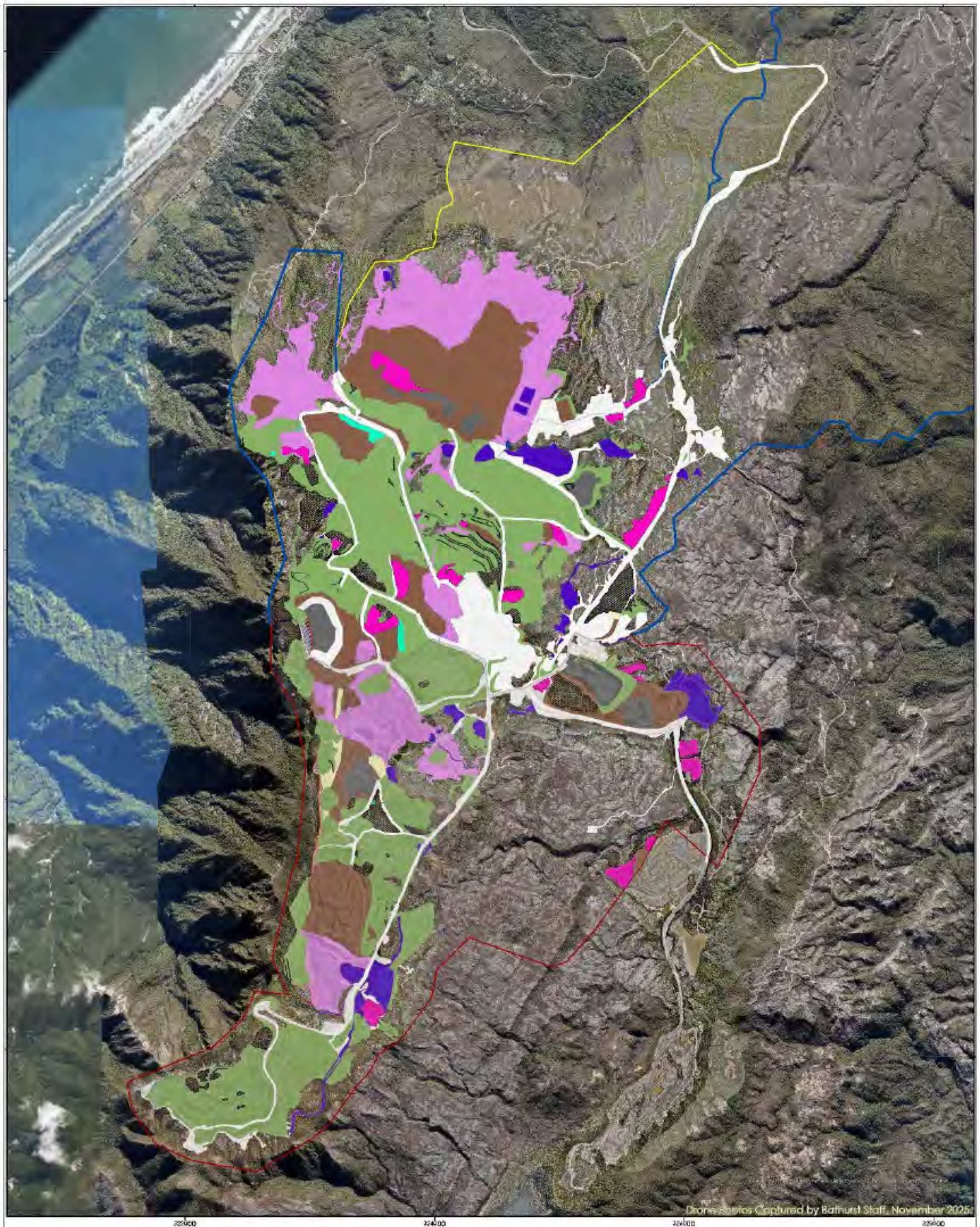
The terrain is characterised by undulating surfaces, steep escarpments, and deeply incised gullies, creating a complex and dissected topography. The Waimangaroa River cuts through the Buller Plateaux, effectively dividing it into the Denniston and Stockton sections. The underlying geology is dominated by sandstone, which has weathered into coarse, acidic silica sand. This results in naturally poor soil development and widespread areas of bare, eroded rock. Due to the low permeability nature of the sandstone and the region's high rainfall, depressions are often waterlogged, whilst sloped areas drain very quickly to adjacent waterways. These topographic and geological conditions present significant challenges for both mining and ecological rehabilitation efforts.

2.3 Land use

The Stockton Plateau currently consists of undisturbed areas (mostly shrubland and some forest), historic mining sites (such as underground tunnels, portals, relics, ponds and buildings) and active mining areas (opencast mining, waste rock areas and coal fines storage sites). The Stockton Plateau also contains native fauna and flora of conservation interest and intersects designated conservation areas.

The harsh climate and poor soil conditions limit alternative land uses such as agriculture or forestry. Instead, post-mining land use has focused on land rehabilitation (Figure 2-2), including recontouring landforms, re-establishing native vegetation, and managing water quality, particularly in response to AMD. Bathurst are currently rehabilitating mined areas at rates of ~30 ha/year, with plans to ramp up to 50 – 100 ha/year from ~2029. To date, ~503 ha of a total disturbance area of 787 ha have been rehabilitated as of March 2025. The land use and rehabilitation areas at Stockton (December 2025) are shown in Figure 2-3.

Figure 2-2 ***Aerial view of Stockton rehabilitation within the Mangatini catchment in February 2026. Mangatini Sump shown to the left of the photo (source: BT Mining)***



Catchment	Active work areas	Coal stockpiles	Highwalls	Infrastructure	Overburden dumps	Rehab stage 1	Rehab stage 2	Rehab stage 3	Rehab VDT	Topsoil stockpiles	Water infrastructure	Grand Total
Millerton	94.42	4.36		22.62	104.11	0.00	1.49	88.72	1.50	7.66	4.27	329.14
Mangatini	56.30	12.26	1.51	125.85	35.61	0.37	2.18	139.39	31.32	19.10	17.43	441.32
Fly Creek	64.91	21.46	2.76	64.57	67.97	5.69	0.09	207.78	26.76	12.27	28.79	503.04
Grand Total	**215.63**	**38.08**	**4.27**	**213.04**	**207.68**	**6.07**	**3.76**	**435.88**	**59.57**	**39.02**	**50.49**	**1273.50**

Figure 2-3 Stockton land use and rehabilitation areas

As future mining winds down, land use will increasingly prioritise long-term environmental stewardship. The rehabilitation objective for Stockton is a return to a stable, self-sustaining landscape that supports native biodiversity and protects downstream ecosystems. Land rehabilitation is an important activity being undertaken by Bathurst which is helping to re-instate a natural hydrological regime and ecosystem processes.

2.4 Geology

Figure 2-4 shows the geology of Stockton Plateau, surrounding areas and waterways. The geological unit descriptions are summarised in Table 2.1.

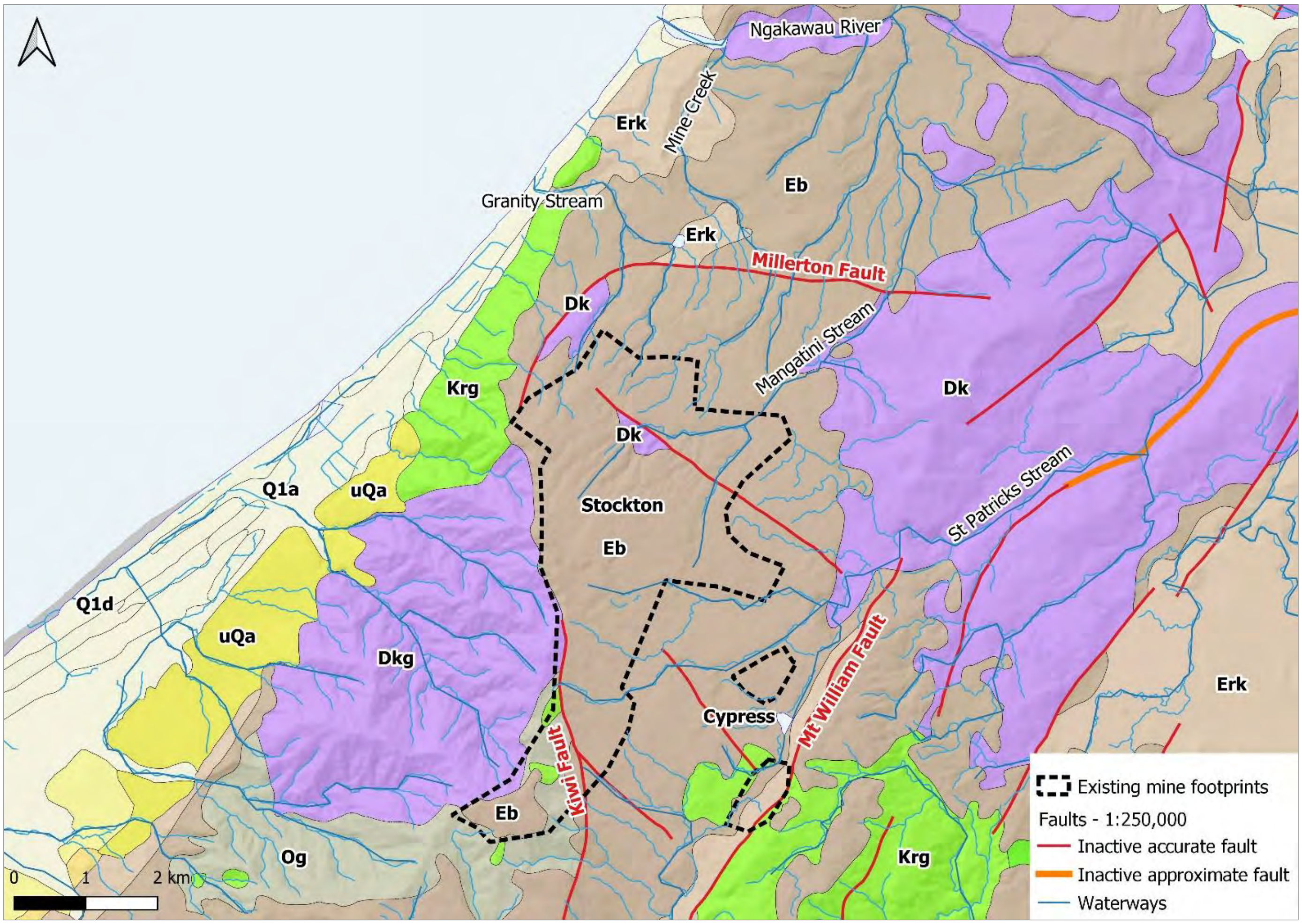


Figure 2-4 1:250,000 geology, faults waterways surrounding Stockton (geological map source: Heron, 2014)

Table 2.1 Summary of the 1:250,000 geological units (source: Heron, 2014)

Legend	Unit code	Key name	Main rock types	Minor rock types
	Og	Greenland Group	Basement: Sandstone	Greywacke and argillite.
	Dk	Undifferentiated Karamea Suite	Basement: Granite	Granodiorite & diorite
	Dkg	Britannia Granite (Karamea Suite)		-
	Krg	Rahu Suite		-
	Eb	Brunner Coal Measures (BCM)	Sandstone	Shale & coal measures
	Erk	Kaiata Formation (KM)	Mudstone / sandstone	-
	uQa	Undifferentiated older alluvial fans	Gravel	Sand & silt
	Q1a/Q1d	Well sorted gravels / dune deposits	Gravel / sand	Sand, silt, mud, clay, boulders, peat

The surficial geology of the Stockton Plateau is dominated by the Brunner Coal Measures (BCM) (geological unit labelled Eb on Figure 2-4). The BCM is comprised of fine to coarse sandstone, minor carbonaceous mudstone beds, and coal measures (10 m to 20 m thick). This unit unconformably overlies Basement consisting of greywackes and argillites intruded by younger granitic material. The BCM comprise coal seams separated by non-coal rock lithologies. AMD generation at Stockton occurs because the coal-bearing sedimentary rock contains relatively high levels of pyrite (iron sulphide).

2.5 Surface water

2.5.1 Waterway catchments and modifications

The Stockton Plateau is dissected by numerous waterways. These waterways contribute to biodiversity and downstream aquatic ecosystems but are also highly vulnerable to impacts from mining activities (historic and present). The key waterways and catchments are summarised in Table 2.2 and shown in Figure 2-5 and Figure 2-6.

Table 2.2 Catchments receiving water from Stockton

Catchment drainage into	Catchment description for report	Key sub-catchments	Waterway discharge location
Tasman Sea	Millerton Block	Miller Stream	Granity Stream
		Granity Stream	Tasman Sea
		Twins Stream	
		Un-Named Stream	
		Hugh Stream	To ground then as groundwater discharge into Kerr Swamp and the Tasman Sea
		Rudolph Stream	
Ngākawau River		Mine Creek	Ngākawau River
	St Patrick	St Patrick Stream	
		Fly Creek	Plover Stream
		Plover Stream	St Patrick Stream
	Mangatini	Mangatini Stream	Ngākawau River
Waimangaroa River	Upper Waimangaroa	Herbert Stream	Upper Waimangaroa River
		Whirlwind Stream	

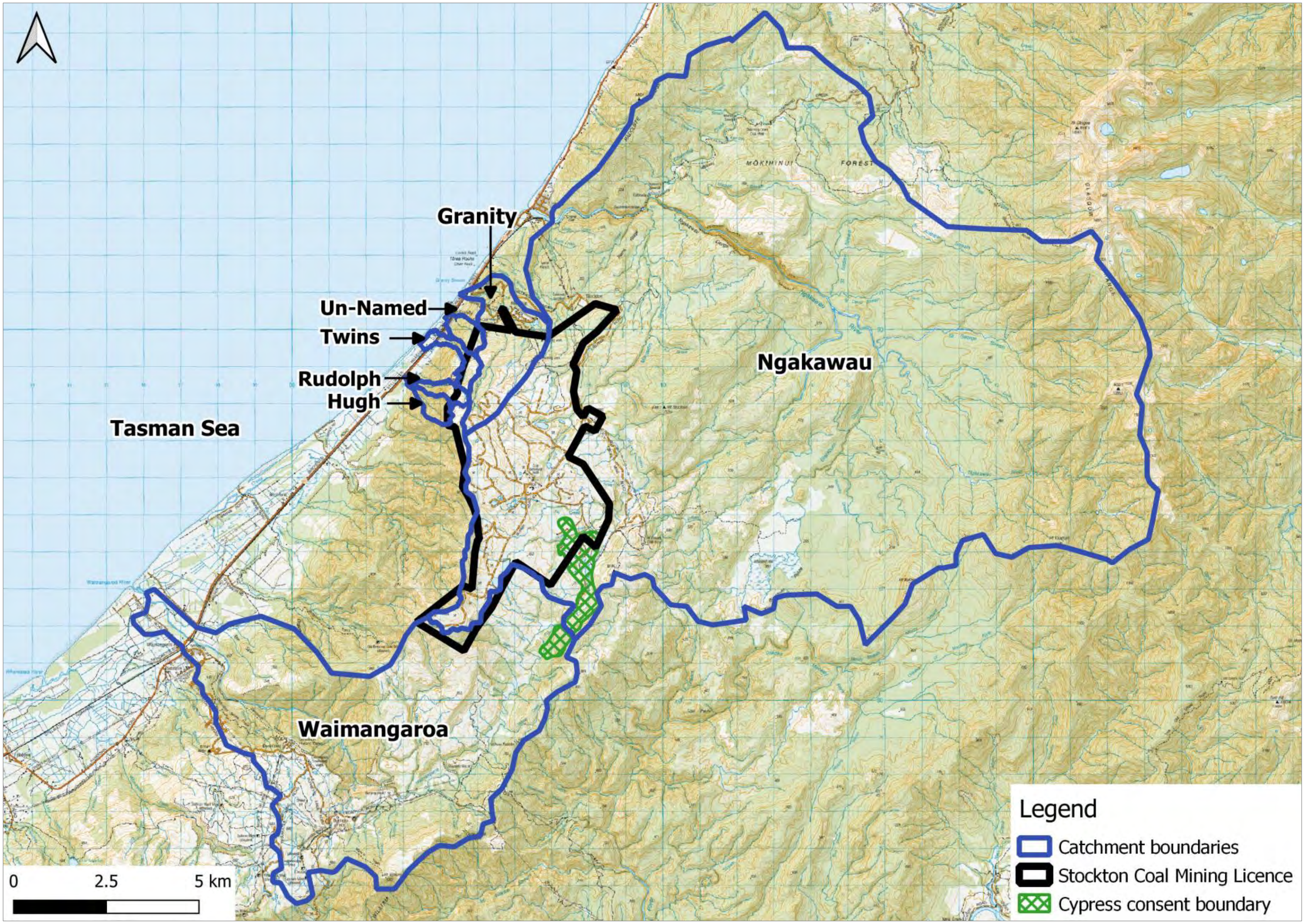


Figure 2-5 Major surface water catchments that intersect Stockton. Cypress consent boundary also shown

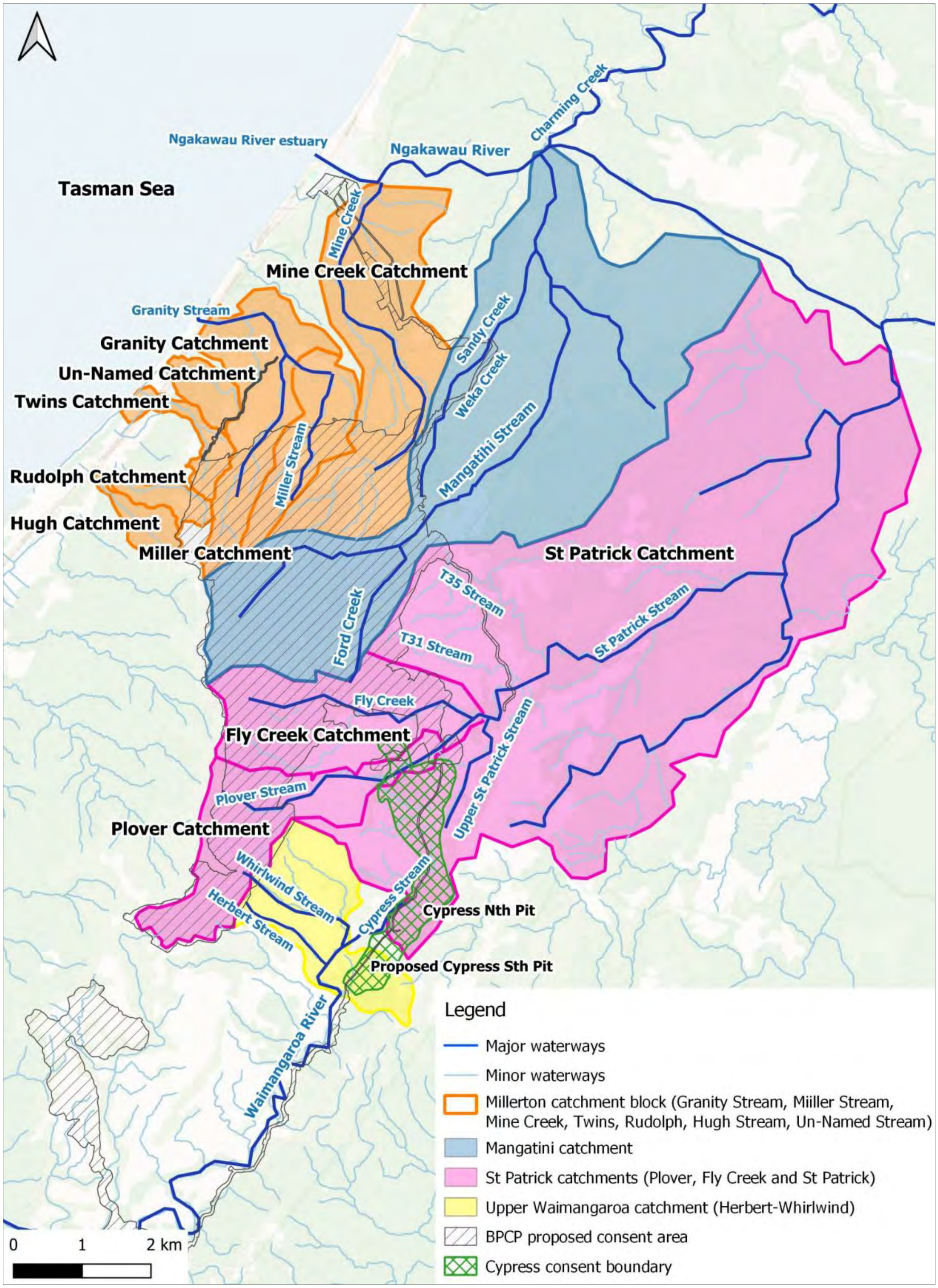


Figure 2-6 Key catchments and waterways discussed in the report

Waterways from the Stockton Plateau drain into one of three locations (Figure 2-5):

- Ngākawau catchment (largest drainage area)
- Directly to the Tasman Sea or indirectly where they discharge to ground (second largest drainage area).
- Waimangaroa catchment (smallest drainage area from the south-west corner of Stockton).

2.5.1.1 Cypress and UHR

The boundary between the Ngākawau and Waimangaroa catchments falls roughly across the Cypress mining area. The Waimangaroa River runs south from its upper reaches, some of which drain from cleanwater diverted around the Cypress mine, and then turns northwest around Mount Frederick (to its north) before flowing to the coast. The proposed UWHR will run across three catchments, from the south Ngākawau, through the eastern (upper) Waimangaroa and into the upper Whareatea (MWM, 2026).

2.5.1.2 Stockton

For this report, waterways draining the Stockton Plateau are classified into the following four areas shown in Figure 2-6 and the Ngākawau River itself:

- Mangatini
- Millerton Block
- St Patrick
- Upper Waimangaroa

The St Patrick Stream, Mangatini Stream and Mine Creek are the main waterways draining into to the Ngākawau River from the Stockton Plateau (Figure 2-6). Coastal waterways adjacent to the Stockton Plateau drain steep headwater catchments and have short low elevation reaches before discharging to the Tasman Sea. Their middle and lower reaches are surrounded by dense native vegetation. A small discharge from the Stockton Plateau into the Waimangaroa River occurs via Herbert and Whirlwind Streams.

Many waterways draining historic and active mining areas do not exist in their natural state and have over time been altered or engineered to manage AMD risk. Water treatment systems, sediment ponds, and diversion channels have been constructed to control flow, reduce erosion, and treat contaminated water before it enters these waterways. However, legacy impacts from historic underground mining continue to affect water quality.

2.5.2 Hydrology and interaction with groundwater

Within the Millerton Block, Mine Creek and Miller Stream lose all their flow into historic underground workings in their upper reaches except in flood conditions when the capacity of the submergences is exceeded by the rainfall runoff (Solid Energy, 2010). Water in these two waterways re-emerge lower in the catchments where underground workings intersect waterway gullies/paths.

Groundwater interacts with Stockton waterways in various ways. In the upper catchments of the Stockton Plateau, many waterways receive groundwater flowing out of historic underground workings that have not collapsed, along with natural groundwater seepages. In contrast, Millerton Block waterways that flow to the coast generally lose water to groundwater in the reaches where they flow across and into the coastal sediments.

2.5.3 Flow variability

Table 2.3 shows the flow variability of key waterways. The high rainfall at Stockton results in frequent flood events and large flow variations seasonally. Both are exacerbated by the steep topography, deeply incised waterways and sparse riparian vegetation. St Patrick Stream (largest catchment) has the largest flows, followed by Mangatini Stream then the combined Millerton Block waterways.

Table 2.3 Flow variability for waterways draining the three largest surface water catchments at Stockton (source: Bathurst)

Catchment	Flow monitoring site	Median flows (L/s)	Lowest flows (L/s)	Maximum flows (L/s)
St Patrick	St Patrick Stream (S16)	886	160	112,020
Mangatini	Mangatini Stream (S14)	467	8	88,800
Millerton Block	Mine Creek Sth Tributary (S23)	152	15	9,270
	Mine Creek Nth Tributary (S6)	80	3	14,465
	Miller Stream (S24)	180	8	8,220
	Granity Stream at Millerton (S25)	40	4	1,717
Based on all available data between 2018 and 2025				

2.5.4 Water quality

Stockton Plateau waterways are largely AMD impacted with a smaller number of non-AMD impacted waterways. O'Kane (2015) identified 24 AMD-impacted waterways requiring treatment. The key AMD impacted waterways are shown on Figure 5-2.

Natural waterway acidity

Many waterways draining the Stockton Plateau exhibit naturally acidic conditions. The level of natural acidity depends largely on the soils and underlying rock type. The naturally low pH results from rainwater passing through thin soils, the presence of abundant organic acids generated by plant matter decomposition, and acid rock drainage due to natural exposure of potentially acid-forming rocks to air and water. The lowest pH (highest acidity) waterways occur in the silica rich BCM sedimentary rocks due to natural weathering of pyrite producing inorganic acid and production of organic acids, combined with limited calcium and magnesium content. Lower natural acidity occurs in waterways draining areas containing non-acid producing granites.

Without mining, the natural waterway pH levels generally range from 4 to >6 and occasionally fall as low as 3.4 (minimum value) in response to first flush through soils (i.e. monitoring site MT6, a pristine tributary of Mangatini Stream).

Mining impacts

AMD impacted waterways draining the Stockton Plateau are shown in Figure 5-2. The AMD mainly comes from mining (historic and contemporary) of the BCM in the waterway's upper catchments near the top of the plateau. As discussed in Section 1.4.1, the sources of AMD, all of which impact waterway quality are (in order of greatest to smallest impact), historic underground (Figure 2-7) and opencast coal workings within and outside Stockton, historic underground coal fires, waste rock areas, fire suppression at Millerton Block and opencast mining.

Downstream of the mining areas, the Mangatini and St Patrick catchment waterways show a general improvement due to dilution by non-AMD tributary waterways. Waterways in the Millerton block, like Mine Creek, often show poorer quality downstream as mine impacted water (passing through historic underground workings) re-surfaces further downstream.

The main impacts of mining on waterway quality are pH as low as 2.5, elevated metal concentrations (especially aluminium, iron, zinc, nickel), elevated turbidity, visual and aquatic ecosystem impacts from orange deposits in waterway beds due to iron precipitation or white deposits due to aluminium precipitation (Figure 2-8). The acidity load in surface water due to AMD is highly variable due to the high flow variability (see Section 2.5.3).

[redacted]

Figure 2-8 White aluminium precipitation occurring at an AMD seep confluence with the upper Waimangaroa River (source: Instream, 2026)

2.6 Groundwater

2.6.1 Stockton Plateau groundwater

Groundwater beneath the Stockton Plateau predominately occurs within generally low permeability sedimentary acid producing Brunner Coal Measures and potentially acid producing Kaitata Mudstone rock (consisting of sandstone, with varying amounts siltstone, shale, conglomerate and coal). This is underlain by low permeability Basement rock dominantly non-acid producing granite, greywacke and argillite. Groundwater within the rock material is controlled by a combination of primary porosity and secondary permeability associated with fractures, as well as underground works in the Brunner Coal Measures (GHD, 2026). A simple conceptualisation of groundwater from Stockton Plateau to the coast is shown in Figure 2-9.

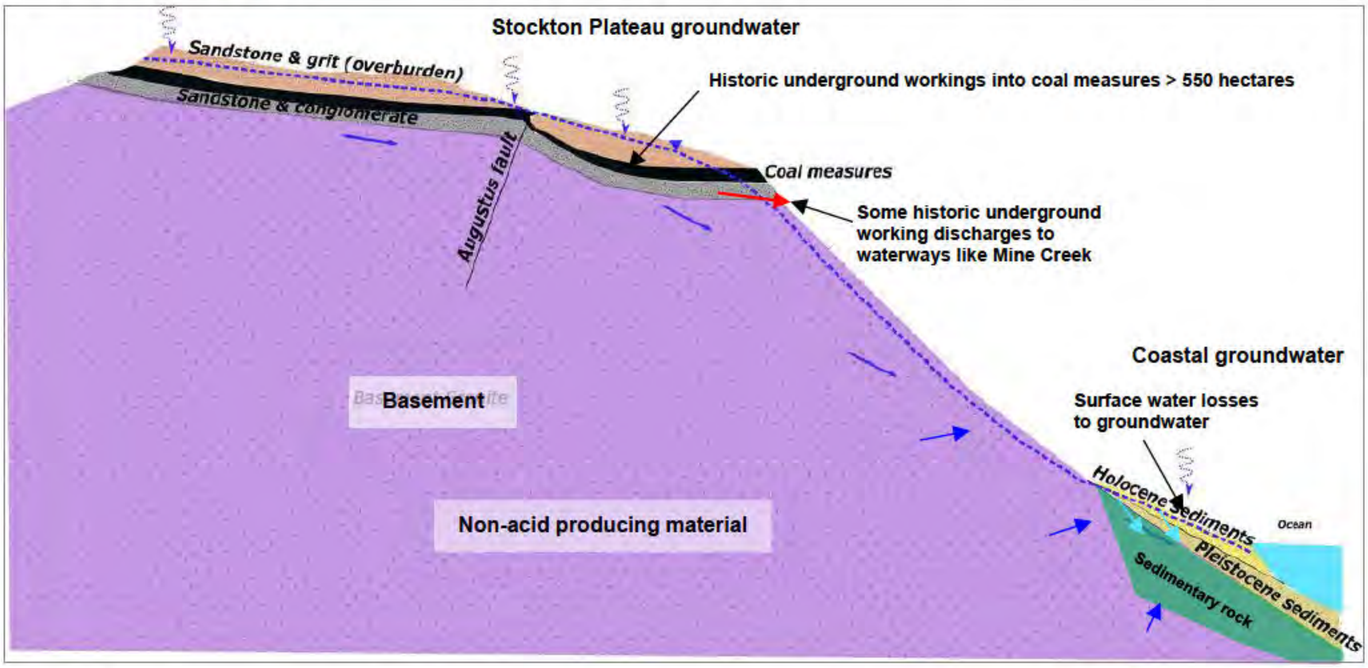


Figure 2-9 Conceptualisation of groundwater from Stockton to the coast (adapted from Trewick, 2008 and Alarcon, 1997)

Based on available data (GHD, 2026), groundwater flows in the direction of the natural topographic surface, with some groundwater discharges to waterways at topographic low points. Most of the groundwater from Stockton flows towards the Ngākawau River. The remainder flows towards and then discharges to the coast. Structural features such as faults, folding, fracturing and weathering also play a significant role in groundwater flow direction, especially in the deeper rock material.

Groundwater (both quantity and quality) on the Stockton Plateau is heavily influenced from historic underground workings, waste rock areas and current opencast mining pits and cuts. This causes localised changes in groundwater chemistry (including AMD), flows toward dewatered zones (drawdown) near pit sumps and potentially mounding in areas due to fire suppression discharges into underground workings in the Millerton Block. The Millerton Block is the most heavily influenced groundwater from mining at Stockton (GHD, 2026).

Groundwater interacts with waterways (surface water) draining the Stockton Plateau. The key environmental impact is where AMD impacted groundwater discharges into waterways, mainly in the upper reaches. The largest source of AMD impacted groundwater to waterways is historic underground workings, some of which intercept the water table. Progressive opencast mining at Millerton Block is removing more of this AMD source. Waterways also receive groundwater from seepages.

AMD impacted groundwater is likely confined to localised areas of active and historic mining within the Brunner Coal Measures. This is because of both the low permeable nature of the host rock and the limited zone of influence away from the active mining areas, in combination with the significant thickness of underlying non-acid forming Basement rock (GHD, 2026).

2.6.2 Coastal groundwater

Between the Stockton Plateau and the coast, groundwater flow occurs within unconsolidated Quaternary coastal sediments comprising river gravels, sands and locally fine-grained estuarine deposits that overly Basement or sedimentary rock. These sediments form highly permeable, unconfined aquifers with hydraulic conductivities typically several orders of magnitude greater than the Stockton Plateau rock. Groundwater recharge is dominated by rainfall and waterway losses to ground (GHD, 2026).

Shallow costal groundwater flows coastward and discharges to wetlands, estuaries and ultimately the Tasman Sea. Fine-grained coastal and wetland sediments locally act as aquitards, influencing water table elevations and discharge behaviour (GHD, 2026).

AMD impacted waterway Twins Stream draining the Stockton Plateau (from the Millerton Block), losses all its flow to groundwater and is therefore a pathway for AMD into coastal groundwater. Some AMD impacted water from Granity Stream may also seep into coastal groundwater. Other than this, Stockon AMD is not expected to influence costal groundwater (GHD, 2026).

2.7 Aquatic ecosystems

Waterways draining the Stockton Plateau may be classified into two broad categories:

1. Natural (no mining impacts) state including those with a naturally low pH with diverse aquatic ecosystems.
2. Mining (impacted) state which ranges from marginally impacted aquatic ecosystems to those generally devoid of life due to the levels of metal contamination and acidity (Instream, 2026).

The Stockton waterways have beds with substrate variably composed of bedrock chute or cobbles, boulders and gravel. The flow regime is highly variable, a characteristic of their natural state. This results in a unique habitat for diverse ecological communities including fish, macroinvertebrates, birds and vegetation (Eikaas, 2004; McDowall, 1998).

2.7.1 Natural state waterways

In their natural state, Stockton Plateau waterways support a diverse array of macroinvertebrate and in some cases fish communities (Blakely, 2010; Harding & Boothroyd, 2004; Hogsden & Harding, 2012; Winterbourn, 1998). The waterways range in size from small seeps to large rivers, sometimes surrounded by low growing vegetation on the Plateau and native podocarp forest at lower elevations (Instream, 2026). Aquatic ecosystems have naturally adapted to the high annual rainfall and distinctive water chemistry (Collier et al., 1990).

Native and endemic fish species

Several fish species naturally inhabit the lower altitude waterways such as the lower Ngākawau River (Harding et al., 2006). [redacted]

[redacted]

The natural pH and dissolved metal concentrations in Stockton waterways fall beyond national guideline criteria for toxicity (ANZG, 2018). An adaptation to this local water chemistry is considered to have created resilience among fish and macroinvertebrate taxa to AMD (Instream, 2026).

Introduced fish species

Introduced salmonids, especially brown trout, are largely absent from most Stockton waterways, specifically those that flow across the more naturally acidic BCM, are AMD affected or are located above steep obstacles.

Brown trout significantly impact native ecosystems and suppress various native species, but they are typically not found in West Coast streams with pH below 6, suggesting naturally acidic streams may serve as refuges for native fish and macroinvertebrates (Greig et al., 2010; McIntosh, 2000; Olsson et al., 2006).

Macroinvertebrates, biofilms and algae

Macroinvertebrate, biofilms and algae have unique and diverse communities in the natural state waterways. This includes those with naturally high acidity and low metal concentrations. In areas of the Buller Plateaux such as the Whareatea River catchment, macroinvertebrate communities in unimpacted sections are diverse and dominated by acid-tolerant taxa (mayfly nymphs (*Deleatidium* spp.)). In the Waimangaroa River catchment, the macroinvertebrate fauna is similarly diverse with pollution-sensitive mayflies, stoneflies and caddisflies. Periphyton in both catchments is typically sparse in the shaded headwater streams, becoming more apparent as thin films or mats in lower reaches with more light availability. This is typical of the Denniston and Stockton Plateaus (Hogsden & Jellyman 2026).

2.7.2 AMD impacted waterways

AMD currently impacts many waterways at Stockton, decreasing the pH and making metals like iron and aluminium bioavailable to fish and macroinvertebrates. Rising pH causes metals to precipitate sequentially – iron above pH 3.5 and aluminium around pH 4.2-4.9. Precipitates result in coloured deposits that can cover fish gills and streambeds, impacting habitat quality for aquatic life (Instream, 2026). The aquatic ecosystem impacts of AMD, including turbidity and precipitates, are well documented globally and in New Zealand. Streams heavily contaminated by AMD usually only support extremophile bacteria and algae (Harding & Boothroyd, 2004; Hogsden & Harding, 2012; Instream, 2026).

Fish species

Fish species diversity and numbers are generally low in AMD impacted waterways, with fish typically absent at pH below 4.5 on the West Coast of the South Island (Harding et al, 2006; Greig et al, 2010). Studies indicate that while pH often drives fish species richness, dissolved metals have a stronger impact in naturally acidic West Coast streams (DeNicola & Stapleton, 2001). As pH drops, metal concentrations rise, worsening impacts regardless of natural tolerance. Fish are harmed by direct toxicity from low pH and metals, gill precipitate accumulation, degraded streambeds, reduced egg viability, loss of food sources, and contaminated diets (Hogsden & Harding, 2012). Aluminium hydroxide precipitation around pH 4.2-4.9 further harms fish by coating their gills, extending AMD impacts downstream beyond the influence of simple metal toxicity (Hogsden & Harding, 2012; Instream, 2026).

Migratory New Zealand fish, diadromous species, face additional challenges. [redacted]

Macroinvertebrates

On the West Coast of the South Island, macroinvertebrates have adapted to naturally low pH, offering some resistance to AMD, though this tolerance varies (Collier et al., 1990). However, metals impact macroinvertebrates more than pH, because local species are adapted to naturally acidic conditions (Collier et al., 1990; Gray & Harding, 2012).

Macroinvertebrate responses to AMD are complex and depend on the species, location, and initial community composition (Collier et al., 1990; Gray & Harding, 2012). Macroinvertebrate species in AMD impacted waterways are less diverse and abundant than those in natural state waterways. Often only the most tolerant of taxa survive in AMD impacted streams or, in severe cases, none (Winterbourn 1998). This decline is mainly due to difficulty regulating ions and metals, as well as altered resources, with water chemistry generally more impactful than habitat changes or precipitates (Hogsden & Harding, 2012).

Stockton AMD impacted waterways are typically dominated by pollution-tolerant species like Chironomidae larvae, Diptera, and worms. Interestingly, they also include mayflies, stoneflies, and caddisflies species usually found in cleaner waterways, while snails, often tolerant of polluted waters, are highly sensitive to AMD. This mix makes it difficult to apply standard water quality and ecological thresholds to manage AMD impacted waterways, particularly those at Stockton (Gray & Harding, 2012).

Biofilms and algae

In AMD affected waterways biofilms and algae shift towards more tolerant species as sensitive species decline (Hogsden, 2013). Metal hydroxide precipitates, caused by pH changes, result in lower species richness by occupying colonisation sites and blocking light. While tolerant algal taxa can reach high biomass with sufficient light and stable flow, precipitates often result in low algal biomass. Fungi and bacteria in AMD waterways typically show reduced diversity and biomass, though some unique extremophile communities exist. Precipitates primarily influence microbial communities, affecting organic matter breakdown rates (Hogsden, 2013).

2.7.3 Other waterway impacts

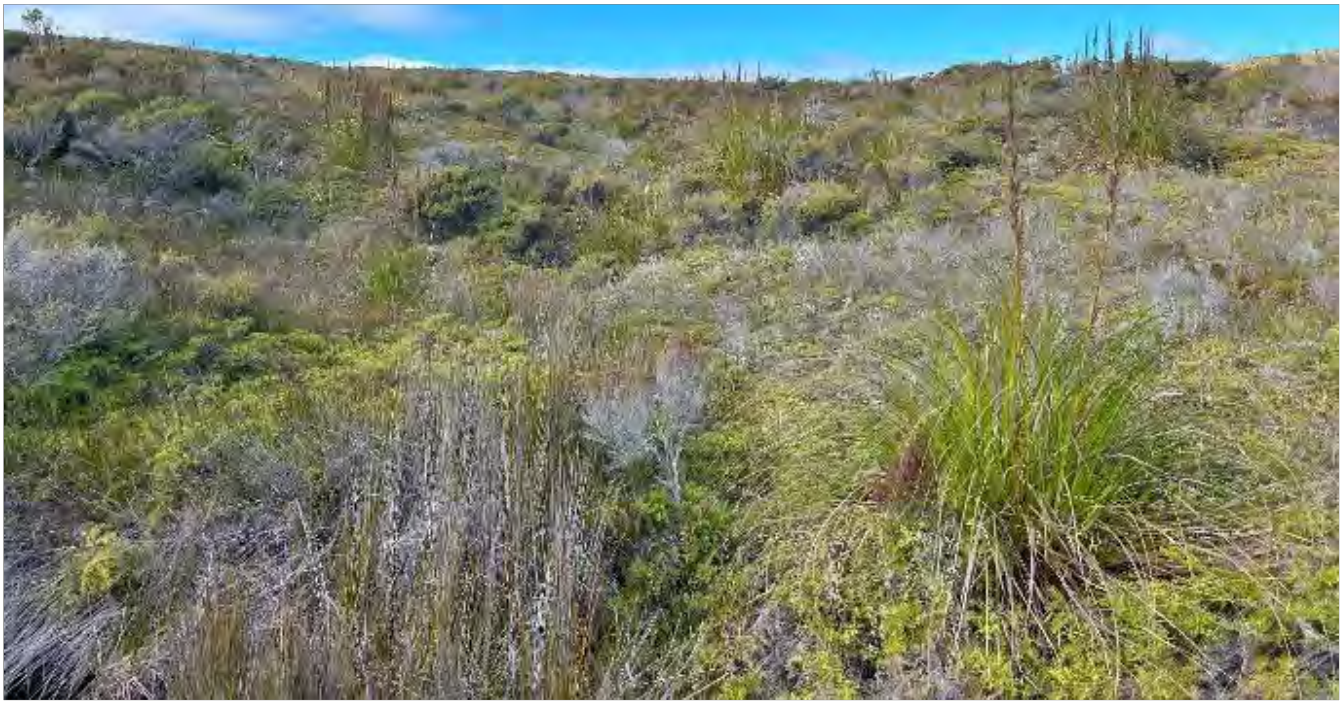
Although not a component of AMD, aquatic ecosystems may also be impacted by high turbidity (sediment concentrations) in waterways draining active mining areas (Boubee et al., 2010; Richardson et al., 2001; Richardson & Jowett, 2002; Rowe et al., 2000, Hickey, 2025).

This sediment can be derived from general erosion of soils, engineered landforms, run off from waste rock areas, soil stockpiles, coal fines, road and excavation works or treatment systems. Elevated turbidity can also result from the AMD precipitates (dominantly aluminium and iron hydroxides) noted in previous sections. Intermittent elevation of turbidity can occur naturally due to flood events in streams and rivers.

As noted at Denniston by Hickey (2025), elevated turbidity levels can affect survival of fish, invertebrate and macroinvertebrate species, [redacted] the most sensitive species. Suspended sediments can decrease water clarity, altering feeding success and habitat quality for aquatic fauna. Migratory cues and movement can also be disrupted in fish in environments with high suspended solids/turbidity; ultimately impacting distribution, population sizes and community structure (Hickey, 2025).

2.8 Wetlands

Parts of the Stockton Plateau exhibit hydrological and soil characteristics typical of wetlands, including soil saturation, surface water, stunted plants and highly leached gley soils. The high rainfall helps maintain these wetland features (ecoLogical Solutions, 2025b). Existing wetlands at Stockton include, 1) mānuka-tussock-wire rush shrubland, 2) mānuka/gahnia-wire rush shrubland, 3) mānuka-mountain flax/wire rush shrubland, 4) Tanglefern shrubland, and 5) pākihi. Photos of a pākihi wetland and a tarn are shown in Figure 2-10 and Figure 2-11 respectively.



[redacted] [redacted]

[redacted] [redacted]

Land rehabilitation at Stockton includes tarn construction and is an established practice to reinstate wetlands. Since the early 2000s, there have been efforts to recreate tarns on impermeable coal floor, in areas rehabilitated with vegetation direct transfer (VDT), and on flat compacted overburden areas. A recently constructed tarn with VDT is shown in Figure 2-12. A 2025 study by ecoLogical (2025a) found that constructed tarns are providing a new and important habitat for macroinvertebrate species which are statistically indistinguishable from natural tarns (ecoLogical, 2025a). Further information on wetlands is provided in ecoLogical (2026).

[redacted] [redacted]

2.9 Iwi

The Mangatini ki Ngākawau - Stockton Plateau, is an important ancestral landscape for Poutini Ngāi Tahu – the Ngāi Tahu people of the West Coast, with records showing occupancy of the West Coast of Te Waipounamu dating back to the early 17th century. The area provided an abundance of mahinga kai. Coastal areas provided shellfish, the rivers primarily provided eels, whitebait and fish, and the river mouths were good places for cultivations.

The Stockton Plateau where BT Mining operations are undertaken, forms part of the Te Rūnanga o Ngāti Waewae takiwa. Waterways draining the Plateau are vital for regional biodiversity, and downstream communities, and the ongoing connection of and protection of mauri for Ngāti Waewae.

2.10 Water users and consents

Maps showing surface water related consents, consented groundwater takes, and WCRC registered bores are provided in Appendix C.

2.10.1 Surface water

Most consented surface water take, use, dam and diversions within and surrounding Stockton are granted to Bathurst for mining. There are several consents for hydro power related activities and two for potable supply and mining outside Stockton which are held by third parties.

[redacted]

2.10.1.2 Domestic and community supply consents

Down-gradient of Stockton towards the coast, there is one consented surface water take for domestic supply and one for community supply Table 2.4 Appendix C-3.

Table 2.4 Surface water takes for domestic and community water supply downgradient of Stockton

Consent	Held by	Take location	Use	Rate of take	Consent period
[redacted]					

[redacted]

2.10.2 Groundwater

2.10.2.1 Groundwater consents

BT Mining consents

BT Mining currently hold three groundwater consents at Stockton which are due to expire in 2027/28. These are for the construction of Duncans Sump (AUTH-RC07007-2), construction of Mangatini Sump (AUTH-RC07229-4) and abstraction of groundwater seepage from McCabe Block (AUTH-RC10256-3). The consents for sump construction are no being exercised. The McCabe Block consent and groundwater condition was for mining the McCabes block and granted 2010. McCabes mining has been completed and area rehabilitated or used for CFSF and McCabes Sump [redacted] personae communication, March 2026). As such, this consent related to the mining pit is not required or relevant (GHD, 2026).

BT Mining also hold groundwater consents for the following activities outside the Stockton CML as detailed in Appendix C-4.

Other consent holders

Groundwater consents within and near Stockton held by other entities are all located outside the proposed consent area and Stockton CML. These include:

– [redacted]

[redacted]

2.10.2.2 Registered bores

There are no registered bores within the Stockton CML or proposed consent area. The closest are 14 bores registered with the West Coast Regional Council and located within the quaternary coastal sediments. None of the registered bores are described as being used for domestic or community potable supplies. Thirteen are described as being used for monitoring (unknown depths) at Kerr Swamp south of Rudolph Stream. There is one consented bore (unknown depth) used for dairying and located more than 3 km south of Twins Stream (GHD, 2026).

The registered bores are summarised in Table 2.5 and detailed in Appendix C-4.

Table 2.5 Registered groundwater bores nearest to Stockton (source: West Coast Regional Council (2026))

Bore ID	Use	Bore diameter (mm)	Status on council database
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

3. Existing and recent historical water management operations, monitoring and consents

Ongoing mining at Stockton has allowed BT Mining to implement management strategies for treating AMD that align with and build on the previous Solid Energy methodology, prioritising reduction of AMD generation through the implementation of encapsulated waste rock areas for overburden and long-term outcomes. Additionally, BT Mining utilises 'dose and settle' techniques to treat AMD-impacted waters. Run-off water is captured in sumps and dosed with lime to neutralise the acidity, before being discharged to waterways. Sludge with traces of heavy metals that settle with other sedimentary material is either discharged via a controlled consented process during high flow events (e.g. floods) or regularly removed and disposed of within waste rock areas (Brown, 2025). The management strategy also provides improvements in other areas such as geotechnical instability and historic underground coal mine fires.

3.1 Crown partnership

The contemporary approach by BT Mining to the management of water and AMD at Stockton is undertaken within the operational and ecological context of the Crown's broader long-term management approach, in alignment with long-term management objectives.

The legacy and current Stockton AMD management approach has recently been thoroughly reviewed by the Crown using a team of internationally recognised experts in AMD management and aquatic ecology. The review findings indicate that the current AMD management approach to progressive improvement of the impacted streams with the objective of sustaining mahinga kai values within three generations (~80 years) is the optimal approach for long-term AMD management at Stockton (Brown, 2025).

The 80-year improvement approach to managing long-term AMD effects is supported by Crown, Iwi and councils. This approach/objective is based on ecological survey evidence of streams that are in recovery and long-term forecasting of continued water quality improvement through the 80-year timeframe (Brown, 2025; Instream, 2026).

In late 2025, LINZ on behalf of the Crown initiated a five-year monitoring and optimisation programme with BT Mining and Ngāti Waewae to refine and enhance the long-term treatment performance for historic AMD sources at Stockton (see The Treasury, 2025a).

3.2 Water management plans

3.2.1 Stockton Environmental Management Plan (SEMP)

The overarching document for water management at Stockton is the Stockton Environmental Management Plan (SEMP) (Bathurst, 2025c). This plan describes the overall framework for environmental management at Stockton. Beneath this plan sit various operating procedures and environmental management sub-plans guided by legislative and non-legislative requirements. The planning framework is shown in Figure 3-1.

The key environmental management subplans related to water management are discussed in Section 3.2.2.

STO-ENV-PLN-002 V2.2 Stockton Environmental Management Plan (SEMP)

Operating Procedures and Plans

STO-ENV-PLN-013 Water Management Plan

STO-ENV-PLN-016 Acid and Metalliferous Drainage (AMD) Environment Management Sub Plan

- PLO-50126 Stockton Operational AMD Sludge Management

STO-ENV-PLN-026 Ngakawau Water Management Plan

STO-ENV-PRO-024 Management of Clean Water Diversions Procedure

STO-ENV-PRO-031 Rehabilitation Stages and Planning Procedures

STO-ENV-SOP-065 Water Management Infrastructure and Pond Inspections Standard Operating Procedure

STO-ENV-PRO-031 Rehabilitation Stages and Planning Procedures

STO-ENV-PRO-032 Water Sampling Procedure

STO-ENV-PLN-005 Environment Protection and Response (Hazardous Substances) Environment Management Sub Plan

STO-ENV-PLN-007 Flora and Fauna Environment Management Sub Plan

STO-ENV-PLN-019 Erosion Control and Land Disturbance Environment Management Sub Plan

STO NV-PLN-026 Ngākawau Coal Handling Facility Water Management Plan

STO-ENV-PRO-010 Design and Sizing of Sumps Procedure

STO-ENV-PRO-069 Dump Standard Operating Procedure STO-TEC-PRO-104.4 Disturbance Permit Procedure

STO-MIN-SOP-105 Pumping Set Up and Maintain Pumps Standard Operating Procedure

STO-ENV-SOP-107 LDS Filter Bed Maintenance and Cleaning Standard Operating Procedure STO-ENV-FRM-319 Active Mining Daily Inspection

Other legislative requirements and guidance

Expectations around water quality and quantity

Iwi – Mahinga Kai Water Quality Targets -3 generations of water improvements, targeting life supporting capacity of water

Ngākawau River Community Target <1mg/L dissolved aluminium 99% of time Community

Bathurst Resources Limited Stockton Mine Stakeholder Engagement Plan

Crown Acid and Metalliferous Drainage Liability

Resource Consents

Bathurst Resources Limited Environment Policy

Department of Conservation and their specialist teams to support biodiversity and species of significance

Any other guidelines as directed by the Department of Conservation.

Figure 3-1 Overview of the current Stockton water management plans and operating procedures

3.2.2 Key Environmental Management Plans

Stockton Water Management Plan STO-ENV-PLN-013 v2.0

The Stockton Water Management Plan outlines the objectives, risks, management controls, responsibilities, and training requirements to effectively manage surface water, groundwater and stormwater impacts from the development, construction, operation, and rehabilitation of Stockton Mine (Bathurst, 2026g). The key objectives are:

- That water discharges from the site are of the highest practicable quality and, as a minimum, comply with all statutory and non-statutory obligations.
- Maintain operational capacity through optimal water management.
- Protect the health and safety of all associated employees and contractors through effective management of inflows from storm events, maintaining water infrastructure and managing discharges.
- Fulfil legal obligations.

Help achieve environmental policy through positive mitigation and restoration of impacted ecosystems.

Stockton AMD Management Plan STO-ENV-PLN-016

The AMD Environment Management Sub Plan sets out the framework for managing AMD arising from development, operation and rehabilitation of Stockton Mine. The Plan applies to all Stockton Mine operations and contractors and forms part of the broader site environmental management framework. AMD is identified as the site's most significant long-term environmental liability, driven by disturbance of sulphide-rich Brunner Coal Measures and legacy historical mining activities.

The management approach follows a hierarchy of prediction, prevention, minimisation, control, treatment, and monitoring / auditing. All overburden at Stockton is conservatively classified as potentially acid forming and is managed through controlled waste rock construction, compaction, alkaline amendment where required, surface water diversion, and progressive capping with low-permeability non-acid forming material and topsoil. Where AMD generation cannot be fully prevented, impacted water is captured and treated using active lime dosing systems, supported by passive treatment measures where appropriate.

A comprehensive monitoring programme is implemented, combining real-time telemetry, routine laboratory analysis, tip head geochemical sampling, and ecological monitoring across key catchments, including the Ngākawau and Waimangaroa systems. Reporting is undertaken through Annual Work Plans and Environmental Monitoring Reports, with results communicated to regulators and community stakeholders. Roles, responsibilities, training, and adaptive management processes are defined to support continual improvement and long-term protection of downstream water values.

Coal Fines Storage Management Plan STO-ENV-PLN-028

The Coal Fines Storage Facility Management Plan has been prepared to manage environmental and operational risks associated with the storage of coal fines generated at the Stockton Coal Handling and Processing Plant for the Buller Plateaux Continuation Project. The Plan applies to all existing and proposed coal fines storage facilities within the Stockton Mine area and supports the Fast track Approvals Act 2024 consenting process.

The Plan describes the environmental and hydrogeological setting, identifies potential surface water and groundwater pathways, and outlines the key risks associated with coal fines storage, including seepage and overflow. It establishes a structured management framework covering facility design, construction, operation, maintenance, water level and freeboard management, and eventual closure and rehabilitation.

A comprehensive monitoring programme is defined, including routine inspections and groundwater seepage monitoring downstream of each facility, supported by continuous and laboratory-based water quality assessment. The Plan also sets out procedures for complaints and incident management, adaptive management, reporting, and defined roles and responsibilities. Collectively, these measures define an approach to managing coal fines storage effects and protecting surrounding water resources.

3.3 Stakeholder engagement

Stakeholder engagement has and continues to be an integral to Stockton water management operations, leading to focused water management outcomes, decisions and strategies.

In 2004, Solid Energy, in consultation with the Stockton Community Consultative Group (Ngākawau Riverwatch Inc)., set performance targets for water quality at monitoring site NR in the lower Ngākawau River. The aim was to enhance water quality in the Ngākawau River so that whitebait could migrate and the river would meet standards considered acceptable for aesthetics and recreation. Although the group was dissolved over a decade, these initial performance targets have contributed to water quality improvement initiatives for the river. The latest framework for classifying aquatic ecosystem state which supersedes the initial performance targets are discussed in Section 5.4.

BT Mining's current operations have stakeholder engagement as an integral part of the SEMP (STO-ENV-PLN-002) and Stockton AMD Management Plan (STO-ENV-PLN-016), and is detailed specifically in the Stockton Mine Stakeholder Engagement Plan. Key water management outcomes that have occurred from ongoing engagement with existing stakeholders is summarised in Table 3.1.

Table 3.1 Existing Stakeholders and engagement that has led to specific water management outcomes

Stakeholder	Water management outcomes
Treasury and LINZ	Long-term management of historical AMD arising from pre-2017 Crown mining activities, including development and implementation of a Crown-led monitoring and remediation [redacted]
Department of Conservation	Ongoing statutory role as land administrator and regulator for mining activities on and adjacent to conservation land at the Stockton Plateau, including oversight of access arrangements and consent conditions that address water management and protection of conservation values.
Regional and District Councils	Regulation and oversight of water discharges and water quality under resource consents, including compliance monitoring, reporting, and enforcement. [redacted]
Millerton and Plateaux Protection Society (MaPPS)	Agreed Memorandum of Understanding (MoU) for management of the Ecological Reserve Protected Area. Outcomes include protection of surface water and headwater streams within the reserve, agreed restrictions on mining extent, access, and drainage to protect surface waters and ecological values within the Ecological Reserve.

3.4 Iwi Participation

BT Mining engagement is with Te Rūnanga o Ngāti Waewae as the overarching iwi authority and as such they are consulted as a matter of course on any major projects. Engagement between BT Mining staff, Ngāi Tahu and Te Rūnanga o Ngāti Waewae has been on-going over many years. Many consent conditions demonstrate the desired outcomes of parties, and regular consultation and meetings impart and share knowledge and information and explore opportunities for partnership initiatives.

BT Mining consult with Ngāti Waewae to ensure monitoring programmes for assessing cultural stream health monitoring are acceptable and appropriate. BT Mining were also in a consultative group with The Treasury and Ngāti Waewae from 2021 to 2024. Ngāti Waewae have been partners with Crown in the Treasury Business Case for Stockton Plateau AMD Management that was released in December 2025 (The Treasury, 2025a).

BT Mining staff have and will continue to meet with Ngati Waewae representatives to discuss the BPCP and consult on future engagement including the process for information sharing (Bathurst, 2025a).

3.5 Water management approaches

Water management approaches have evolved over time. Initial efforts concentrated on sediment capture only. Today, Stockton water management involves the capture and treatment of both sediment and AMD from historic and current mining areas prior to release back to waterways.

In some cases, some of this water is released into a different catchment, for example, Mangatini catchment sump water is diverted to the Millerton (Mine Creek catchment) for fire suppression.

The overarching water management approaches that apply to all catchments include:

- Reducing erosion by minimising runoff velocities, disturbance areas and managing the direction of water to designated areas.
- Diversion of cleanwater around disturbed areas.
- Diversion of runoff from disturbed areas to sediment control structures.
- Design and construction of in-pit sumps for sediment settling and water capture prior to pumping.
- Risk-based approach for water structure design that includes provision for climate change variations (Bathurst, 2026e).
- ELF design and construction to reduce AMD generation.
- Trials and demonstration through extensive monitoring of the effectiveness of active and passive AMD treatment.

The existing water infrastructure used to achieve this is shown in Figure 3-2.

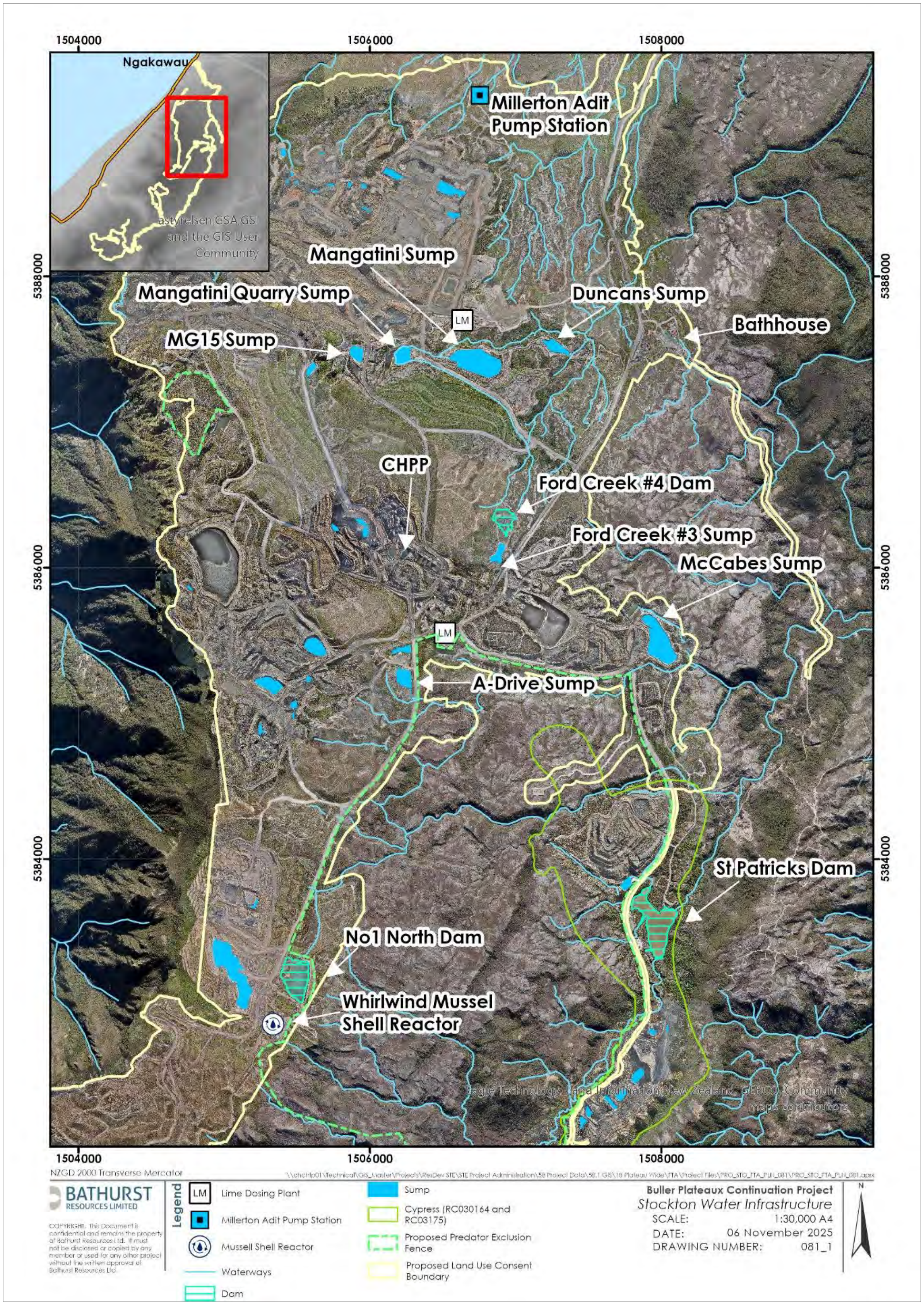


Figure 3-2 Current Stockton water management infrastructure

3.5.1 Water management infrastructure

The management of water from active mining and rehabilitated areas is important for waterway quality and aquatic ecosystems. Bathurst manages this by separating contaminated 'minewater' and 'stormwater' from 'cleanwater' prior to its discharge into waterways. Each water type is discussed below:

- **'Cleanwater'** run-off and seepage from undisturbed and suitably rehabilitated areas where water quality is suitable for direct discharge into natural waterways. This water is diverted from the work area as much as possible to retain the receiving waterways' natural flow and minimise water volumes requiring treatment.
- **'Minewater'** run-off from disturbed areas such as active coal pits, coal processing and stockpiles, and surfaces of waste rock areas that have not yet been fully rehabilitated as well as groundwater and seepages. The main minewater seepages come from waste rock areas, followed by coal fines storage areas. The main minewater sourced from groundwater is the historic underground coal mining areas (existing tunnels and adits that have not collapsed).
- Minewater requires AMD correction and sediment capture prior to discharge into receiving waterways. This water is generally captured in 'in-pit sumps' for initial settlement of solids from where it is pumped to mixing channels where a suitable alkaline reagent is added. The mixing channel feeds into settlement sumps where the sediment and AMD precipitates are retained and the clear, pH corrected supernatant water is decanted into a natural waterway. The structures and treatment methods act together to improve the water quality of the mine's discharge to achieve compliance and reduce effects on aquatic ecosystems and vegetation.
- **'Stormwater'** run-off from disturbed areas (typically stripping areas and the initial break in works) where the water requires sediment capture via sumps, check dams and silt fences, prior to discharge into receiving waterways but not AMD treatment. Treatment for sediment removal is expected to be required until the rehabilitation surface has been fully established. At this point it becomes cleanwater.

The separation of these water types has largely been achieved by the interception of runoff at various dams and sumps across the CML, including settlement ponds, dams, sumps and numerous smaller temporary sumps that have been deployed as required by mine operations (Bathurst, 2025).

3.5.1.1 Water collection systems

The water management system begins with the collection of run-off, seepages from waste rock areas and groundwater from historic underground workings across the mine site. In areas of historic underground mining or where groundwater seeps into active pits, sump pumps and dewatering wells are installed to capture inflows (both groundwater, surface water runoff and rainfall) to prevent water from accumulating in working areas. These systems help maintain safe, dry conditions for operations so that water is directed efficiently toward treatment infrastructure.

Collected water is then directed into a series of engineered containment structures, including dams and sumps. These vary in scale and progress with mining activities. Cleanwater diversion channels typically bypass these systems entirely, while stormwater and minewater are retained long enough to allow sedimentation or initial chemical adjustment. The strategic placement of these sumps across the mine landscape allows for hydrological separation of water types and supports effective staging of treatment.

3.5.1.2 Ponds

The current inventory of ponds, with a breakdown by catchment and consent status, is provided in Table 3.2, whilst an overview of all ponds and their consent status is provided in Figure 3-3.

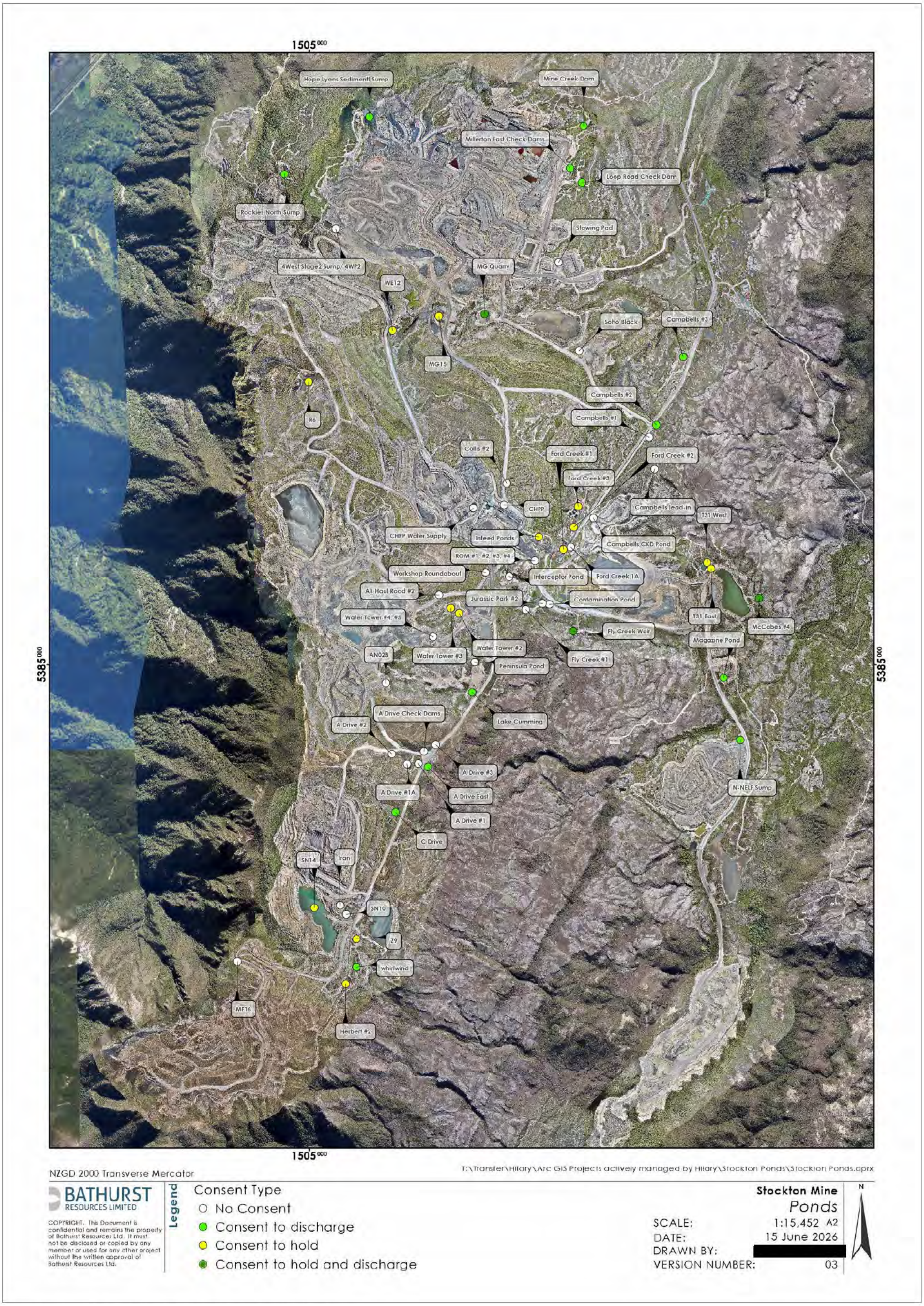


Figure 3-3 Pond inventory and consent status (source: Bathurst)

Table 3.2 ***Summary of pond inventory per catchment***

Catchment name	No. of ponds	Pond consent status per catchment			
		No. of ponds with consent to hold and discharge	No. of ponds with consent to hold	No. of ponds with consent to discharge	No. of ponds with no consent
Cypress	10	N/A	N/A	N/A	10
Mangatini	21	1	7	2	11
Millerton	6	5	N/A	N/A	1
St Pats	30	2	7	5	16

3.5.1.3 Water treatment

Bathurst employs a range of passive and active water treatment approaches to manage sediment and AMD at Stockton.

Passive treatment

Passive treatment typically involves the construction of reactor beds that strip out metals or raise the pH as waters from small constant seeps pass through the passive treatment system. Passive treatments often use materials rich in acid buffering capacity such as crushed mussel shell. While the systems are gravity fed and passive, once established, they require maintenance to prevent clogging, removal of sludge and eventual replacement of substrates once exhausted. Passive treatment examples at the site include:

- A small-scale passive treatment system which involves trickling low flow AMD impacted waters through a bioreactor containing neutralising material of crushed weathered mussel shells (Mussel Shell Reactor) to treat the AMD. This system captures and treats AMD impacted waters that would otherwise discharge into Whirlwind Stream (and eventually the Waimangaroa River).
- Source control activities which involve reducing the quantity of AMD being generated in the first place. This is achieved through capping and management of PAF waste rock storage areas with 300 – 400 mm of weathered granite to minimise water and oxygen infiltration. Okane (2015) noted rehabilitation including capping reduces acid loads by ~50%. Bathurst is capping up to 30 ha of Stockton every year, in conjunction with the ongoing terrestrial rehabilitation programme Section 3.5.2.

Estimates show a further 20% reduction in acidity load generation can be achieved through installation of cleanwater diversion drains and establishment of vegetation cover (Bathurst, 2021a).

Active treatment

Active treatment systems are the only viable option to treat the large and variable discharges, sediment and AMD loads that occur across most of Stockton. These systems typically involve the installation of dosing plants that supply the required rate of acidity buffering reagent to a treatment stream. The systems require operational infrastructure such as a settling and precipitation location, or sump, along with ongoing power, reagent and maintenance costs.

Minewater and stormwater requiring active treatment is routed through a multi-stage process designed to settle particulates, increase pH, neutralise acidity and precipitate dissolved metals. After initial sedimentation removal in in-pit sumps, water is pumped to mixing channels where an alkaline reagent from a lime dosing plant (calcium hydroxide or calcium oxide or similar) is added. This chemically raises the pH and promotes the precipitation of metal contaminants. The treated water then flows into secondary sumps, where precipitates and sediment settle out and the clarified, pH-adjusted water is discharged into nearby waterways.

3.5.1.4 Sludge management

Sludge is generated from the AMD treatment systems, in particular the Mangatini Sump, McCabes Sump, and Whirlwind Mussel Shell Reactor (MSR).

The sludge is comprised of physical sediment eroded from upstream mining activities and mineral precipitates formed during AMD treatment. Stockton's sludge management strategy included as part of the '*Stockton Operational AMD Sludge Management* report (Bathurst, 2025b) (prepared for the FTAA) outlines the different methods used to handle and treat sludge generated from AMD. The key aspects are discussed below.

Sludge collection and handling

– Pumping system – A submersible pump, suspended 4 m below the water surface on a pontoon is used to collect sludge from the sump. The pump is moved ~5 m every 15 minutes using a winch.
– Staging sump – The collected sludge is directed to a staging sump where the slurry's solids content is mixed to achieve consistency.

Sludge dewatering methods

– Filter beds – Constructed using stripped overburden material from mining pits, these beds are lined with a pH-neutral sealing layer and equipped with Megaflo drainage pipes covered in drainage metal. A 0.5 m layer of coal fines, a reject material from the coal handling and processing plant, serves as a filter medium to retain solids while allowing free drainage of water.
– Geotube bags – An alternative dewatering method involves the use of geotube bags, which are filled with the sludge slurry and left to dewater over time.
– Pressure filtration is not used as sludge dewatering method at Stockton.

Sludge disposal and recycling

– Controlled discharge – During periods of consistent rainfall and high stream flows, low density sludge (LDS) is released from the Mangatini Sump via floating decants or pumped directly into Mangatini stream. The discharge rates are controlled based on Mangatini Stream flows and water turbidity to ensure compliance with consent conditions.
– Recycling initiatives – Exploratory studies are underway to assess potential to recycle sludge, particularly focusing on its rare earth elements content. This initiative aims to reduce waste and recover valuable materials.

Environmental monitoring and compliance

– Real-time monitoring – Telemetry systems monitor water quality parameters in real-time to ensure that discharge activities comply with environmental consent conditions.
– Biennial reviews – As part of the Mangatini Sump management plan review, a biennial review is conducted to update the discharge control matrix and verify that the natural environment has not suffered adverse effects from the sludge management operations. This includes an updated contaminant load model to assess the water quality results from the previous two years.

3.5.2 Land rehabilitation

3.5.2.1 Background

The conditions of the Stockton CML require the licence holder to implement rehabilitation research as necessary to inform effective rehabilitation of the mining disturbance areas. This research is ongoing and BT Mining has fully rehabilitated over 40% of disturbed mine footprint at Stockton since the CML commenced in 1987. This equates to ~503 ha of rehabilitation and includes ~60 ha of VDT (Vegetation Direct Transfer) and over 3.2 million indigenous plants, planted at densities of 6,000 – 9,000 plants per ha.

Each year BT Mining provide rehabilitation actuals (areas rehabilitated in the previous year) to councils and councils approve the rehabilitation plan for the following year. Figure 3-4 shows an example of a rehabilitated area using VDT.

Figure 3-4 Rehabilitated area on Stockton Plateau using VDT in April 2018 (source: Bathurst)

Rehabilitation at Stockton is challenging because of high rainfall; shallow, naturally acidic and infertile soils; cool temperatures; and low solar radiation. Progressive rehabilitation of disturbed sites remains a fundamental goal of the Stockton rehabilitation strategy with a view that the earlier site rehabilitation is completed, the sooner a self-sustaining ecosystem can become established, and ongoing maintenance costs are reduced (ecoLogical, 2025a).

There are also previously disturbed areas on the Stockton Plateau where no remediation has been attempted. These sites include historic mines and settlements which pre-date rehabilitation efforts or which are outside the direct control of BT Mining. These previously disturbed sites are referred to here as 'non-remediated sites' (ecoLogical, 2025a).

Initially the key focus under the Stockton CML was to rehabilitate landforms for the purpose of reducing sediment runoff to waterways and ponds used for onsite water management. In 2004, large-scale recontouring of overburden placement areas was undertaken to create a more natural landform and help control water flows (ecoLogical, 2025a).

It was also recognised that rehabilitated landforms reduce AMD generation from acid generating overburden and increase the organic carbon in the water which reduces the toxicity of many metals to aquatic life. In addition, overtime, there has been an increased drive to establish aquatic and terrestrial ecosystems similar in structure, diversity and function to that of nearby undisturbed ecosystems (ecoLogical, 2025a).

3.5.2.1.1 Waste rock

The Stockton rehabilitated areas are primarily comprised of waste PAF waste rock, largely sourced from opencast mining. Historical waste rock areas inherited by BT Mining and dating back to opencast mining commencing in 1950's, generally lacked engineered underdrains, were uncapped, have 15m tipheads, experience material segregation and channelling, and have relatively high permeability and seepage flows. Solid Energy started capping waste rock areas in 2006. The encapsulated waste rock areas approach that is currently applied at Stockton is a significant improvement. All AMD seeps from waste rock areas within the Stockton CML are also currently captured by the

Stockton AMD management systems and treated in the Mangatini and McCabes Treatment Systems using CaO dosing to neutralise and treat AMD.

In the future, waste rock areas designed as Engineered Land Landforms (ELFs) are being proposed under the BPCP at Millerton Block (discussed in the Millerton Block AMD Water Management Plan. STO-ENV-PLN-027), and in the ESE and MFS BPCP sub areas. This will result in result in further improvements to minimise AMD generation.

3.5.2.2 Current operations

Rehabilitation at Stockton is undertaken as per the ‘Stockton Rehab Design Guidelines’ - a staged process / method developed and refined over many years, ensuring rehabilitation occurs as per consent and CML conditions (Bathurst, 2026b).

The objectives of the rehabilitation are to create safe and geotechnically stable sites, incorporate landforms that are sympathetic to the surrounding landscape and encourage an indigenous, self-sustaining and diverse vegetation cover and ecosystem (ecoLogical, 2025a).

Figure 3-5 shows the areas (blue hatched) within the Stockton Mine footprint that have been confirmed by the regulatory authorities as rehabilitated as of May 2025.

The approach has been one of progressive rehabilitation, meaning rehabilitation work is done in tandem with mining instead of waiting until all operations finish. A range of stabilisation and rehabilitation techniques have been developed to conserve soils and native ecosystems at Stockton. These include:

– PAF rock management and compaction.
– Final landform shaping (contouring).
– Capping and topsoil spreading.
– Vegetation rehabilitation:
    - Planting (locally sourced native species).
    - Seeding (primarily with pasture grasses and lotus, into established exotic grasses or bare soil).
    - Hydroseeding (usually slopes or batters too steep to plant).
    - Vegetation Direct Transfer.
    - Nutrient application (to help overcome high acidity and infertility of soils).
– Tarn construction (ephemeral subalpine and alpine ponds in the context of Stockton).

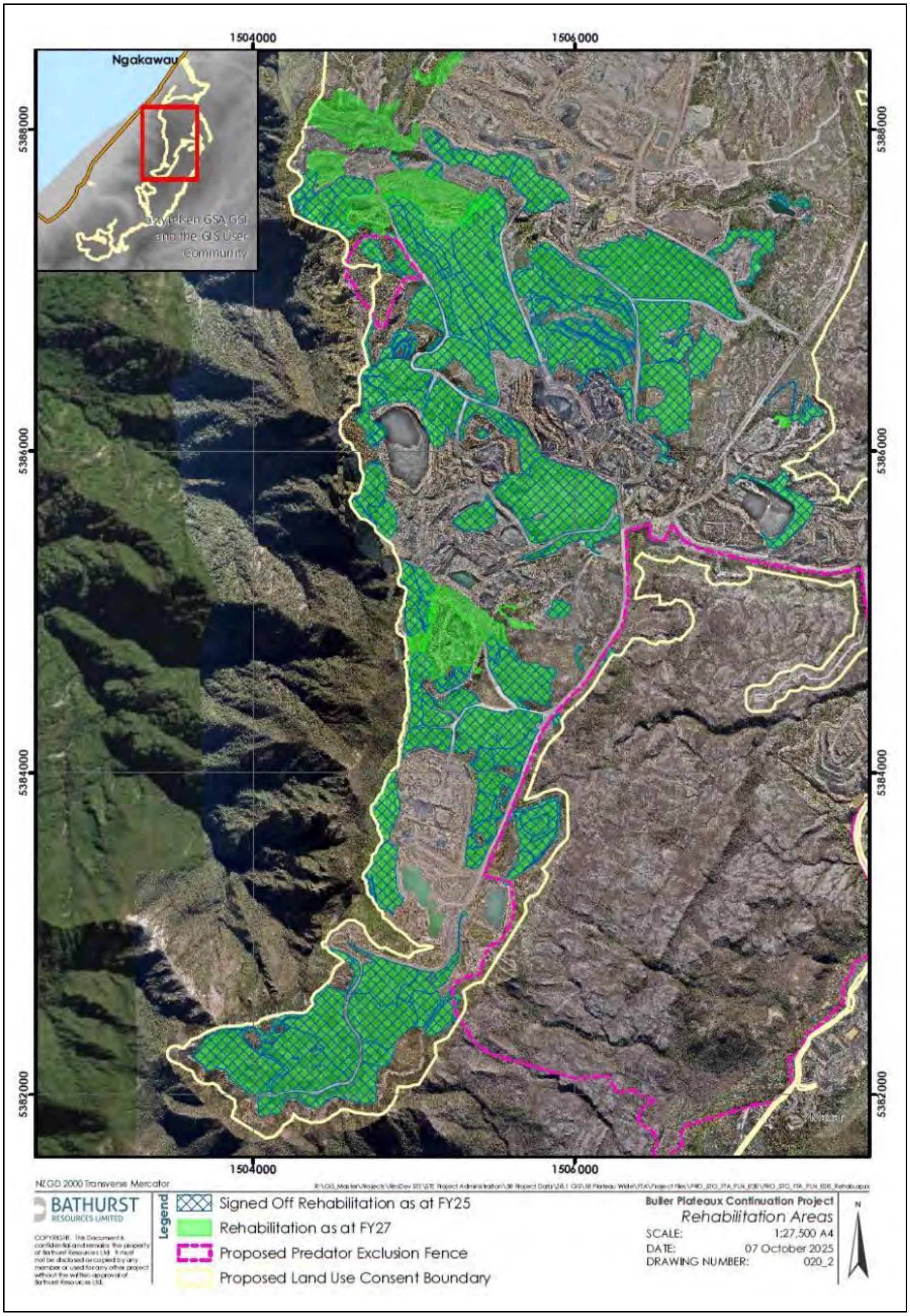


Figure 3-5 *Current Stockton rehabilitation areas as of May 2025*

The general rehabilitation process involves several key stages:

1. **Recontouring and stabilisation** – Overburden engineered landforms are reshaped from steep slopes to gentle gradients (18–20 degrees) to reduce erosion and manage AMD. The land is also reshaped sympathetic to its surrounding landscape to help restore the drainage system.
2. **Capping and growth medium application** – A 400 mm layer of weathered granite is applied to seal the substrate, followed by a 200 mm layer of growth medium composed of nutrients and stockpiled soil. This combination improves soil fertility and pH, promoting vegetation growth. The process of capping, followed by re-vegetation after mining operations, which reduces water and oxygen from coming into contact with PAF material (O'Kane, 2015). Capping techniques at Stockton have improved over time. O'Kane (2015) estimates capping can reduce AMD by about 50% compared to uncapped waste rock.
3. **Hydroseeding and native planting** – The capped areas are initially hydroseeded with fast-growing grasses to stabilize the soil. Over time, these are replaced with indigenous plant species to restore native ecosystems.

3.5.2.3 Current rehabilitation

Table 3.3 summarises the general land use and rehabilitation areas within the disturbed footprint of the three main catchments at Stockton as at 2025 (Bathurst, 2026b). Non-rehabilitated areas contribute to AMD loads and include activities such as active work areas, coal stockpiles and overburden areas. Some AMD seepages also occur from rehabilitation areas. Landforms that do not contribute AMD include infrastructure, topsoil stockpiles and water infrastructure (Bathurst, 2026b).

Table 3.3 General land use and rehabilitation of the main surface water catchments at Stockton as at 2025 (source: Bathurst, 2026b)

Catchment	Total disturbed footprint area (ha)*	Non – rehabilitated (ha)	Rehabilitated area (ha)	Other landforms (ha)
		AMD generation	Reduced AMD generation	No AMD
Mangatini	441	107	172	162
Millerton Block	320	193	92	35
St Patrick	500	160	234	106
* This is not the total catchment area which would include all the undisturbed natural catchments.				

3.6 Water management by catchment

Each surface water catchment utilises a tailored water management strategy and AMD treatment system based on mine status, waterway flow variations, contamination type and available space.

3.6.1 Overview

Table 3.4 provides an overview of current water management, mining activities and waterway contaminant sources by catchment at Stockton. Further details are provided in sections 3.6.2 - 3.6.5.

Table 3.4 Overview of current water management and mining activities by catchment at Stockton

Current state	Mangatini	Millerton Block	St Patrick	Upper Waimangaroa
Mining activities	None	Active opencast	– Small opencast – CFS	Waste rock storage
Land use	Predominantly rehabilitated	Partially rehabilitated	Predominantly rehabilitated	Predominantly rehabilitated
Relative AMD contribution to Stockton waterways	Moderate	High	Low	Very low
Water contaminant sources to waterways	Underground workings	– AMD fire suppression water from Millerton Pit into underground workings – Underground workings. In particular, AMD groundwater from DC Adit, most discharging into Mine Creek ***(future treatment proposed)*** – Seepages and run-off run-off from disturbed mining areas	– CFS – Underground workings	Embankments and waste rock material containing PAF
AMD contribution from adjacent mining areas	None	Rockies coal mine – opencast and historic underground mining. Impacts on Twins and Rudolph Stream.	– Cypress Mine Historic Fly Creek Underground Mine	Cypress Mine (Cypress Stream - Waimangaroa Tributary) is impacted by Cypress Mine
Historic underground workings – main source of AMD	Small area remaining	Large area remaining	Small area remaining	None
Key water treatment infrastructure	– Mangatini Sump – LDP1	– Sediment check dams – Mangatini Sump	– McCabes Sump – LDP2	– MSR
Water sources treated	– Mangatini Stream – Some water from Millerton Block DCA Adit	– Groundwater from underground workings at DCA Adit diverted to Mangatini Sump	– Fly Creek – Cypress Mine AMD – McCabes CFS	– MFQ seepage into to Whirlwind Stream
Treated water discharges to	AMD treated discharge to Mangatini Stream upstream of S14C	– Sediment treated discharge to waterways – AMD not treated apart from DC adit	AMD and CFS treated discharge to St Patrick Stream	AMD treated discharge to Whirlwind Stream
Not-treated AMD water discharges	– Minor from Ford Creek and Duncans Sump to Mangatini Stream – Historic underground workings to Mangatini Stream	– From historic underground workings into Mine Creek, Miller Stream, Granity Stream. Twins Stream and Rudolph Stream	– Southern area to Plover Stream ***(future treatment proposed from 2034)*** – Historic Fly Creek Underground Mine in the north AMD discharge to St Patrick Stream	Herbert Stream

3.6.2 Mangatini

3.6.2.1 History

AMD treatment in the Mangatini catchment has evolved and improved over time. Key milestones are listed below:

– Pre BT Mining operation at Stockton (Solid Energy, 2016):
  - 2007: Direct dosing of Ultrafine Limestone (UFL) slurry to Mangatini Stream (near S14C) in 2007.
  - 2009: Mangatini Sump on-line in July 2009
  - 2010: Construction of Mangatini Sump and UFL dosing above the sump (for AMD sludge capture) in 2010.
  - 2012: Three-year plan initiated to improve the performance of Mangatini Sump.
  - 2012 – 2014: Extensive alkaline reagent field trials
  - 2015: Construction of LDP1 dosing Calcium Oxide (CaO) above the sump in 2015.

– Under BT Mining:
  - 2018: Consent for decant and pump discharges when stream conditions are suitable.
  - 2018: Consistent LDS pumping to filter beds for dewatering.
  - 2020: Installation of pump and winch system to enable LDS removal from the decant end of the sump.
  - 2021: Intermittent CaO dosing upstream of Mangatini Quarry Sump to allow precipitate settling prior to MG Sump.
  - 2023: LDS pumping upstream of MG Quarry Sump for recycling to utilise the ANC within the LDS and promote a denser precipitate.
  - 2025: Installation of the inlet weir gate to better control flows to Mangatini Sump and reduce bypass flow time.

A process flow diagram showing how these features operate together as a central part of Stockton's water management system is shown in Figure 3-6.

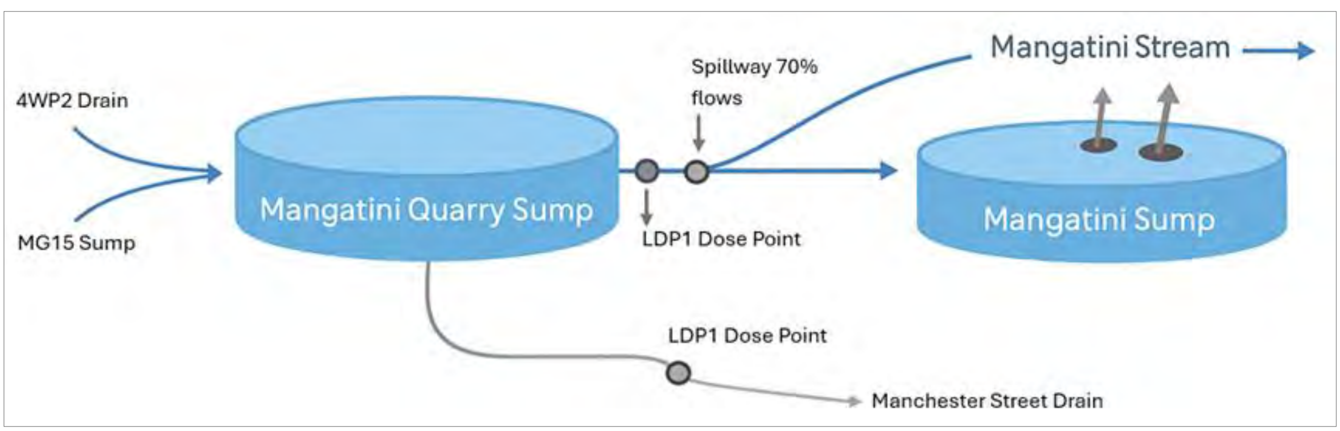


Figure 3-6 Flow diagram for Mangatini Sump and LDP 1 located within the Mangatini catchment

3.6.2.2 Mangatini Sump

When the Mangatini Sump (Figure 3-7) was first commissioned, UFL was the dosing reagent used to adjust pH upstream of the Sump. Using UFL, the target pH adjustment of ~pH 5 at the Mangatini Decant (MGD) and associated metals removal rates were achieved. However, the treated water often lacked clarity because the UFL was less effective than CaO at flocculating and removing fine colloidal solids (consisting of natural clays and AMD precipitates).

The change in dosing reagent to CaO was also made because UFL was found to be inefficient; with significant proportions of the UFL remaining un-reacted and present as layers within the sludge that accumulated in the sump. The change to CaO has improved both discharge water clarity and AMD treatment efficiency. The change to dosing with CaO was made in December 2014.

Figure 3-7 Mangatini AMD treatment Sump and rehabilitated landform up-gradient (sources: Solid Energy 2016)

An unexpected consequence of the change to CaO use in 2014 was that the density of the sludge collected in the sump is lower than that produced using UFL. A layer of Low Density Sludge (LDS) in the order of 8 m in depth developed when CaO dosing commenced. The LDS layer causes faster sludge build-up, reducing sump capacity. The Mangatini Sump Project was initiated by Solid Energy in July 2016 and continued by Bathurst to assess the options for management of LDS. A key objective was to retain the improved water treatment achieved through dosing with CaO while preventing uncontrolled release of LDS. The options tested can be grouped into the following categories:

– Disposal of LDS to land.
– Sludge consolidation/densification.
– Disposal to catchment.

In addition, numerous tests have been performed on sludge characteristics to try and better understand settlement behaviour and sludge characteristics. The ongoing programme of works has significantly influenced the current operating procedures for the Mangatini Sump. Insights gained from these efforts continue to shape the strategies employed to improve the sump's performance.

Moreover, elements of the programme remain active, ensuring continuous refinement and optimisation of the sump's operations. Based on the results of the Mangatini Sump Project, the Management Plan (in Bathurst, 2025b) for sump operation includes:

– Continue and optimise dosing of the inflowing water with CaO upstream of the Mangatini Sump.
– Diversion of the Mangatini Stream into the sump for flows up to the 70th percentile flow event and bypass of the partially treated flow for greater than 70th percentile flows.

– Discharge of LDS from the decant to the Mangatini Stream in high rainfall conditions and discharge of LDS by pump when stream flows are in the range of 70th to 80th flow percentiles, as per a control matrix that aligns discharge rates with stream flows.
– Ongoing testing of options for sludge densification within the sump.
– Ongoing testing of LDS disposal to filter beds.
– Geo-bag use for LDS disposal retained as a contingency measure.

The Mangatini Stream is diverted into the Sump when flows are below about 3 m^3/s; equivalent to the 70th percentile flow event. The inlet culvert can pass up to 15 m^3/s but the inflow is restricted by the height of the water in the Sump. A minimum 2 m freeboard of cleanwater is generally maintained above the sludge and this is decanted off to the Mangatini Stream downstream of the sump. When flow increases and the Sump water level exceeds Relative Level (RL) 593.5 m, water bypasses the sump and is discharged through the spillway above the inlet. The Mangatini Sump operating regime schematic is shown in Figure 3-8.

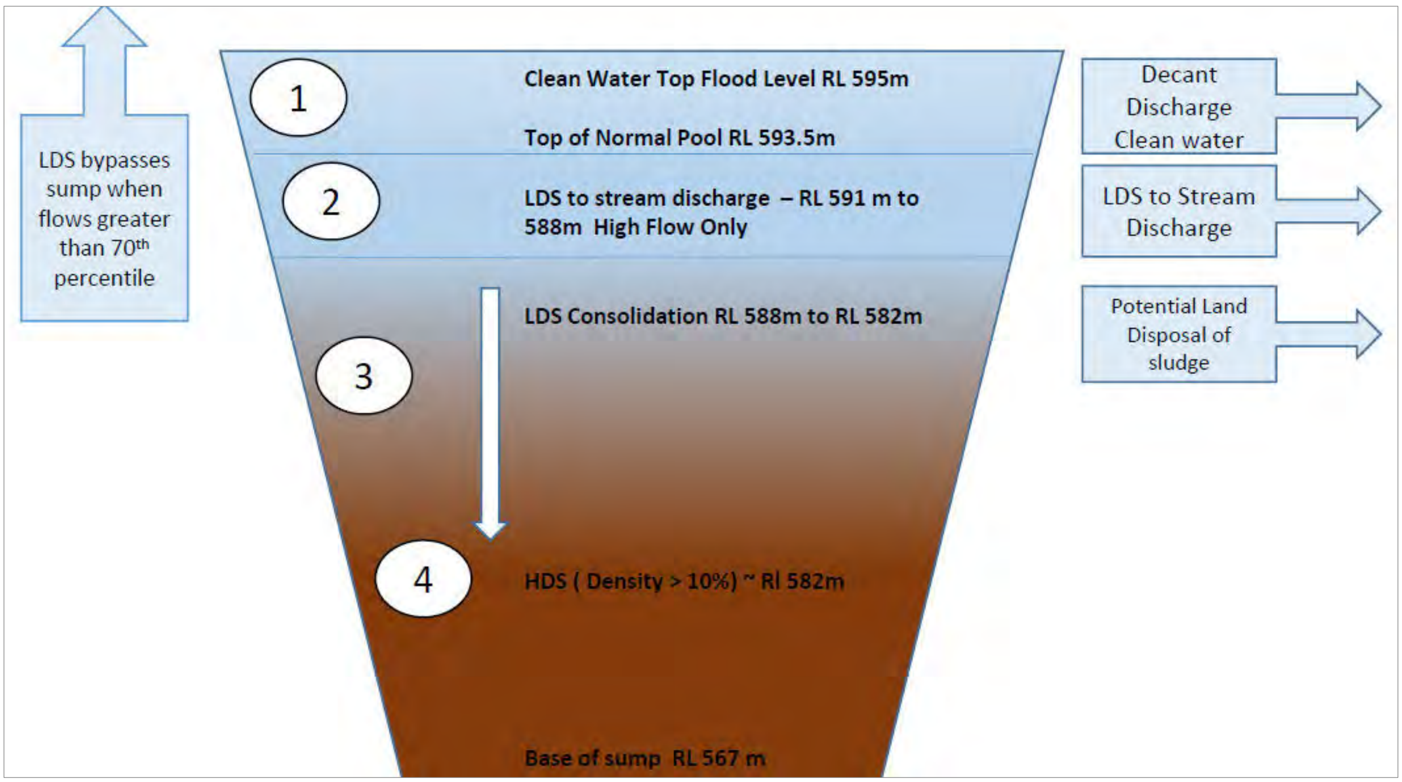


Figure 3-8 Mangatini Sump operating regime schematic (source: GHD 2018)

The Mangatini Sump Management Plan formed the basis for the 2018 consent variation which permitted LDS discharge under the control matrix guidelines.

Bathurst is required to review the sump operation every two-years and provide the WCRC with an update on the implementation of the management plan.

These reviews have been prepared by GHD since 2018 to provide independence. As noted in the update below no major changes in approach have occurred since the Management Plan was submitted to WCRC. However, there are ongoing learnings and improvements continually occurring.

The most recent update on the Mangatini Sump Management Plan implementation was completed on 8 October 2024 by GHD (2024). GHD reported that the key elements of the plan that Bathurst has been implementing and testing over the previous two years included:

– Discharge of LDS in extended high rainfall/flow events subject to a discharge matrix that aligns decant discharge rates with receiving water (Ngākawau River) flows.
– Bypass of the Mangatini Stream for all flows at and above the 70th percentile flow rate and in preparation for discharge events when the inlet culvert needs to be blocked.
– Ongoing trialling of land disposal options including with filter beds.
– Ongoing trialling of LDS recycling to create a denser sludge.
– Ongoing review of the discharge matrix applied to LDS decant releases.

Figure 3-9 shows how these elements fit into the overall strategy of continuous trialling.

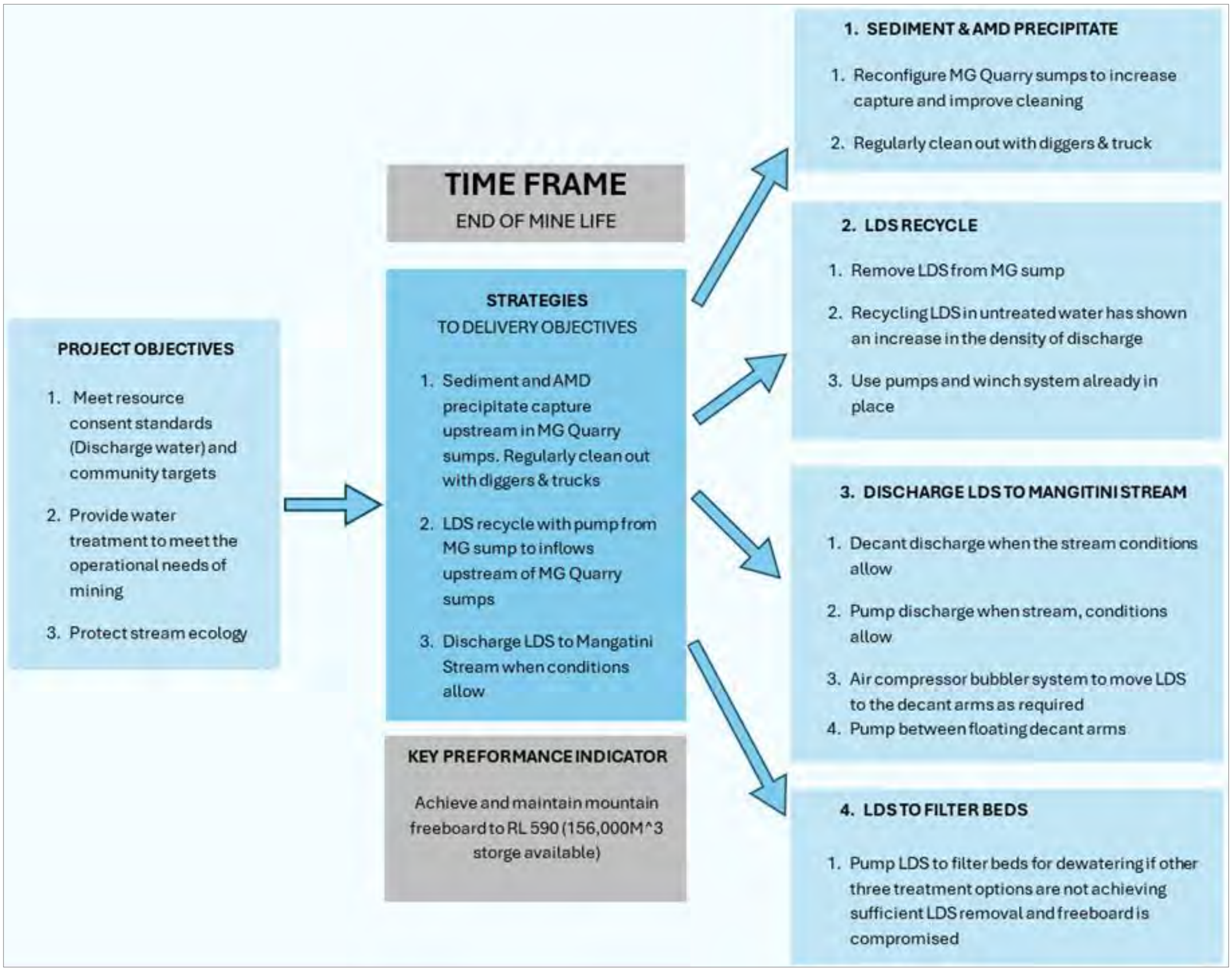


Figure 3-9 Mangatini Sump management strategy

Bathurst continues to refine the operation of Mangatini Sump to improve LDS collection and discharge. A current option being investigated is transition to Magnesium Oxide (MgO) which generates significantly less sludge volumes.

3.6.2.3 Current treatment

The Mangatini catchment is largely rehabilitated mining areas, with runoff from disturbed and rehabilitated areas reporting to Mangatini Sump for treatment and settlement. A limited area of historical underground workings remain. AMD impacted and groundwater within these workings emerges into Mine Creek below the Mangatini Sump.

The LDP1 and Mangatini Sump are the key current Mangatini Catchment AMD treatment infrastructure. The current AMD treatment regime in this catchment includes (Bathurst, 2026b):

– AMD is collected from across the catchment, diverted to Mangatini Sump and discharged to Mangatini Stream after treatment.
  - All flows are CaO dosed upstream of Mangatini Sump.
  - Low to moderate flows are diverted into Mangatini Sump where AMD precipitates are captured. Treated water is discharged to Mangatini Stream via floating decants.
– High flows (> 70^{th} exceedance percentile) are diverted down the Mangatini Sump bypass.
– Minor AMD loads from Ford Creek and Duncans Sump discharge to Mangatini Stream below Mangatini Sump and are not CaO dosed.
– All Mangatini catchment AMD is discharged to Upper Mangatini Stream upstream of monitoring site (S14C).

3.6.3 Millerton Block

Millerton is the most AMD impacted catchment at Stockton. Therefore, water management within this catchment is particularly important for improving waterway quality. The water within this catchment falls into four broad categories:

1. Groundwater baseflow and surface water runoff from ***undisturbed areas*** into Twins Stream, Granity Stream, Miller Stream, and Mine Creek.
2. Groundwater / seepage discharges and surface water runoff from ***disturbed mining areas*** collected in small in-pit sumps created within low points of the advancing Millerton (opencast) Pit. The in-pit sumps typically have submersible pumps that direct water to the main Millerton Pit sump. From here the water is pumped into 1) the ground to supress underground fires (when required), 2) into historic underground workings for controlled discharge into Miller Stream, Granity Stream, Twins Creek and Mine Creek, or 3) upslope to the Mangatini Sump for treatment.
3. Stormwater from the access track is diverted to local sediment check dams constructed in tributary gullies.
4. Much of the groundwater within the Mine Creek S23 tributary from the underground workings is collected in the Millerton Drainage Control Adit (DCA) (the Adit). The Adit was constructed during historic underground mining operations to drain a naturally forming syncline in the coal floor. The flows collected at the syncline and discharged through the DCA are assumed to represent the combined flows from the S23 component of underground workings that will be removed as the Mine Pit progresses through the Syncline over the remaining LOM. AMD from historic underground workings is collected from drainage pipes installed within a concrete stopping, 70 m upstream of the Millerton Adit (Adit is an underground passage from the land surface). This water is directed to either Mine Creek (western tributary) or a pump station that discharges upstream of Mangatini Sump when triggered by high turbidity water. Electric centrifugal pumps at the adit stopping will manage underground water reporting through from the syncline as required.

Following overburden removal and coal extraction from the Millerton opencast pit, mined areas are backfilled, capped and progressively re-vegetated. The process of fire suppression, backfilling (which significantly reduces water and oxygen ingress) and rehabilitation has long term benefits to the overall quality of the waterways.

A water balance flow diagram for the Millerton Block is shown in Figure 3-10.

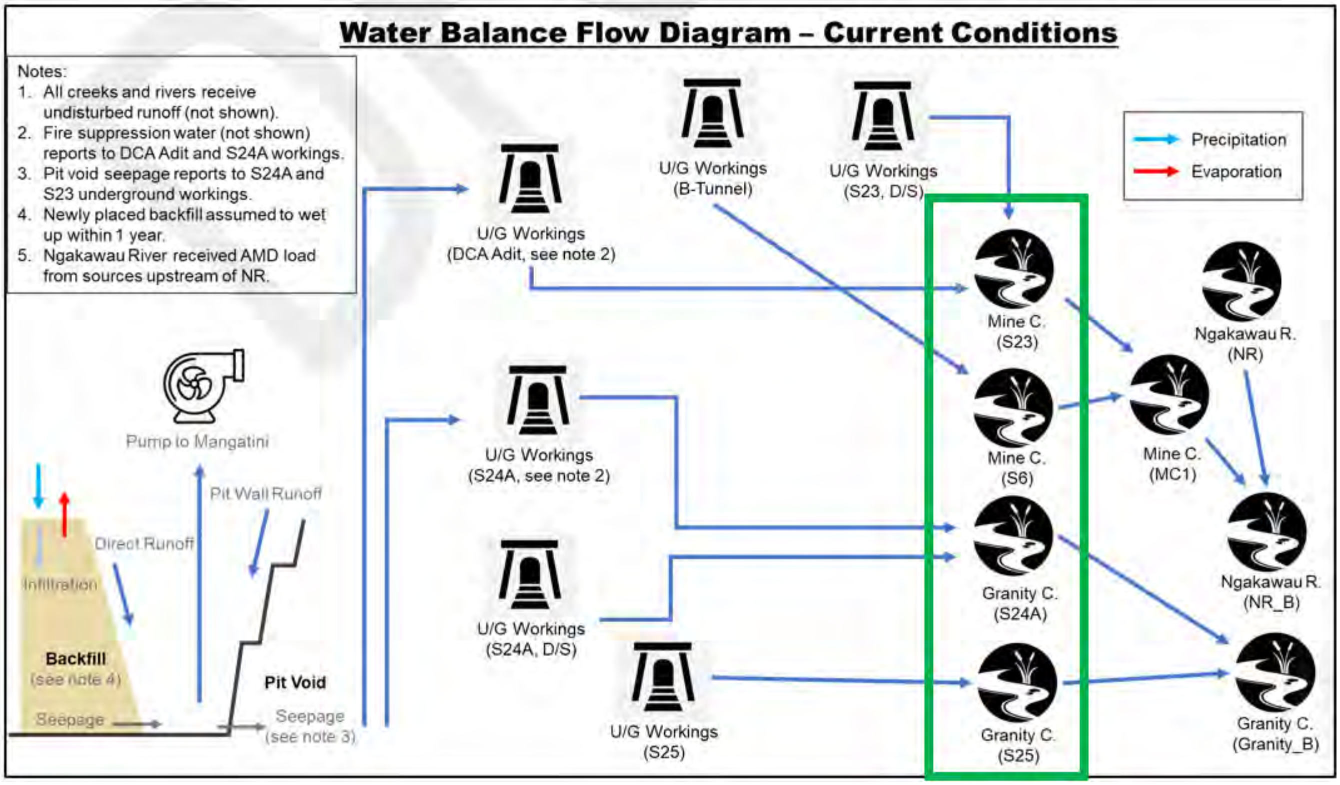


Figure 3-10 Millerton Block water balance for current conditions (consent Compliance sites in green box) (Source: MWM (2024)

3.6.4 St Patrick

The St Patrick catchment consists of predominantly rehabilitated mining areas, a small portion of active opencast mining at the A-Drive and historic underground workings. The catchment produces a relatively small amount of AMD compared to the Millerton Block and Mangatini catchment. The southern part of the catchment, which is predominantly rehabilitated, reports directly to Plover Stream with no current treatment. However, future treatment of Plover Stream is proposed from 2034, coinciding with the cessation of Cypress acid loads to McCabes Sump (also known as the McCabes Lower Sump).

The process flow diagram in Figure 3-11 provides an overview of water management in this catchment. The Lime dosing plant 2 (LDP2) and McCabes Sump are the key AMD treatment infrastructure in this catchment. The LDP2 was commissioned in 2020 and has been used to incrementally increase AMD treatment in the St Patrick catchment.

A summary of the main treatment systems and when they commenced (Bathurst, 2026b) is provided in Table 3.5.

In addition to the AMD water treatment infrastructure discussed in Table 3.5:

- Localised sediment ponds provide primary settling before discharging into No.1 North Dam.
- St Patrick dam discharges to St Patrick Stream and provides sediment capture from the Cypress haul road run-off. Water for dust suppression use on site haul roads is taken from A-Drive Sump or St Patrick's Dam.
- Plover Stream has been re-routed away from underground workings after a flood resulting in decreased acid load.

Approximately half of the historic Fly Creek Underground Mine (mined from 1913 – 1970) workings sit within the northern region of the proposed consent area of the St Patrick catchment. The remainder occur down-gradient of and outside the proposed consent area. The historic workings are also located downstream of St Patrick Catchment AMD treatment infrastructure (McCabes Sump) and discharges from these workings into St Patrick Stream cannot be practically diverted for treatment.

Table 3.5 Summary of the key AMD treatment infrastructure in the St Patrick catchment (information source: Bathurst, 2026b)

Date commenced	AMD treatment of water from	Infrastructure	Treatment descriptions
2020	Cypress pits Cypress NELF	LDP2	**Used to neutralise (treat) acid.** LDP2 (CaO) slurry pumped from LDP2 to St Patrick Reservoir to neutralise (treat) Cypress Project AMD pumped from the dewatered opencast pits.
2023 – Oct	Cypress pits Cypress NELF McCabes CFS	McCabes Sump (Figure 3-12)	**Used to collect sediment and AMD precipitates.** McCabes catchment AMD flows directly to mixing channel / primary settling sumps. Diversion of Fly Creek AMD up to 70th percentile flows at the diversion weir. Pumping Cypress Project AMD to McCabes Sump will continue until Cypress End of Mine Life for the Cypress Project in 2033. Plover Stream treatment up to 70th percentile scheduled to start in 2034 (after Cypress treatment ends).
2024 – Jan	Cypress pits Cypress NELF McCabes CFS Fly Creek		

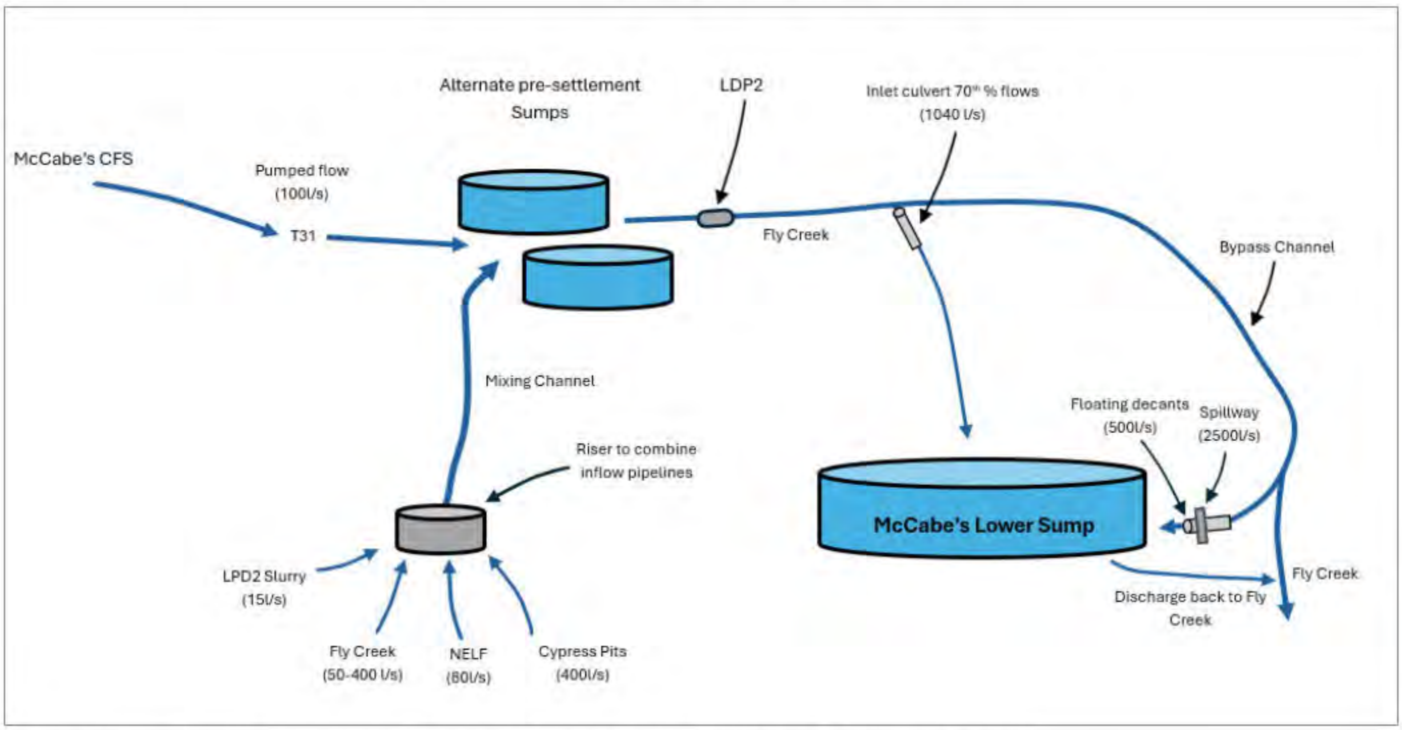


Figure 3-11 Process flow diagram for McCabes Sump and LDP 2 located in St Patrick catchment

Figure 3-12 McCabes AMD treatment sump - operational since 2024 (source: Bathurst 2025b)

3.6.5 Upper Waimangaroa

Most of the existing Mt Fred Block is rehabilitated and drains to Plover Stream (St Patrick Catchment) via a series of permanent cleanwater and AMD diversion drains and sedimentation ponds, including the No 1 North Dam. There are relatively small areas of Mt Fred Block disturbance in several tributaries of the Upper Waimangaroa River. These disturbances are due to historic construction of embankments to support haul roads, permanent diversion drains, and other infrastructure. Embankments were constructed using materials including PAF BCM and resultant seepages from both embankments are AMD.

A MSR passive treatment system was commissioned in 2012 to treat one of the AMD seeps reporting to Whirlwind Stream. This has resulted in variable improvements in downstream water quality, depending on relative flow rates of other uncaptured AMD seepages and the MSR performance. AMD seepage to Herbert Stream (currently untreated) is being assessed as a part of the Crown/LINZ led AMD management optimisation project for future treatment (The Treasury, 2025a).

3.7 Existing water rights and resource consents

Stockton operates under a complex framework of water rights and resource consents that govern its mining operations, water usage, discharges, and environmental management. Water related resource consents have been issued by the WCRC and are essential for the mine's operations, particularly concerning AMD management.

3.7.1 Initial water rights (Deemed Permitted Activities)

Before the Resource Management Act 1991 (RMA) came into effect in 1991, water rights were governed by the Water and Soil Conservation Act 1967. Under this regime, Stockton was granted its initial suite of water rights that are foundational to its current water management system. These remain live under the transitional provisions of RMA.

Water Rights 890221–890240 authorise the take, diversion, discharge, and damming of water across the CML 37150. While foundational, as operations have changed additional consents have been sought, as required, under the RMA.

3.7.2 Existing resource consents

Bathurst holds resource consents covering a range of activities, issued over various periods under the RMA. Bathurst is responsible for complying with all consent conditions, which cover water take, damming, diversion, discharge, and related land-use activities within the CML. Examples include:

- Taking of water for coal washing, dust suppression, and fire suppression.
- Diversion of natural flows and/or cleanwater around various mined areas.
- Damming of various streams and diversion of water for treatment (via water treatment plants or sumps).
- Discharge of alkaline dosing agents into various streams.
- Discharge of treated stormwater into various streams.
- Discharge of minewater and wastewater into various streams.
- Discharge of mussel shells to land.

The types of conditions imposed on these consents (amongst other things) include:

- Specific locations for the take, damming, diversion and discharge activities.
- Requirements for the maximum quantity of takes and diversions, and timing of discharges.
- Discharge limits and water quality compliance limits and requirement for monitoring (at various specified locations) of temperature, conductivity, pH, turbidity, hardness, suspended solids, metals, calcium, magnesium, sulphate, ammonia, acidity, and flow rates.
- Macroinvertebrate sampling and fish surveys.
- Reporting requirements.

Figure 3-13 shows the number of regional resource consents and their expiry dates relating to water management. Most (13) are due to expire in 2027/28 with a further 11 consents expiring between 2033 and 2054.

3.7.3 Further information

Further information on the following is provided as part of the application:

- Activities that require new consents (i.e. activities not authorised by existing consents).
- Activities authorised by existing consents, but those consents expire imminently and need renewal.
- Activities authorised by existing consents, but which new consents are sought for (ensure they are fit for purpose).
- Activities authorised by existing consents but need changes to remain fit for purpose.
- Activities authorised by existing long-term consents (i.e. expire in the 2040’s) that remain fit for purpose. These activities are out of scope for the BPCP FTAA Application but have been noted within the application since these existing permits will continue to be relied upon.

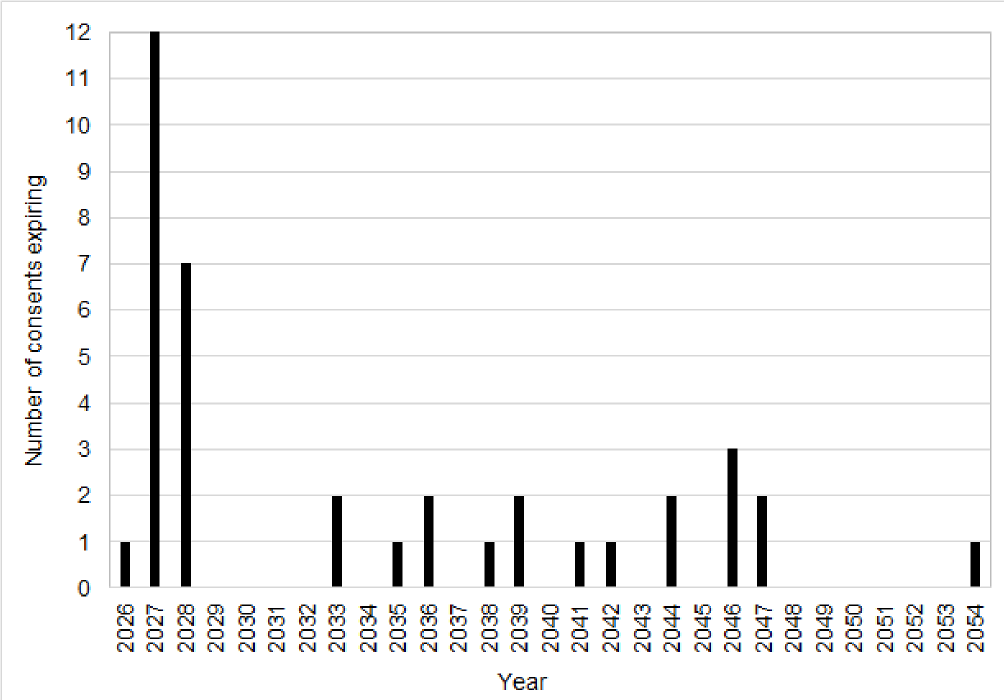


Figure 3-13 Expiring summary of regional resource consents relating to water management

3.8 Water monitoring and consent compliance

Bathurst uses both required measures specified by resource consents for mining activities and additional voluntary practices (performance monitoring) to manage water on-site and address operational and community needs. The results from the environmental and water monitoring programmes inform mining operations, [redacted]. Compliance reports are also provided to the regulators.

3.8.1 Current monitoring and Compliance sites

The current monitoring includes:

- Real-time (surface water) water monitoring telemetry sites and trigger alarms.
- Groundwater monitoring bores in Millerton.
- Manual daily/weekly/monthly water samples collected by the Bathurst Environmental Water Sampler.
- Annual fish surveys in upstream catchments and background “reference” streams for migratory species.
- Macroinvertebrate surveys in downstream catchments.
- Bryophyte surveys in downstream catchments.
- Visual inspections of water bodies as part of daily operations by environmental and operational staff.
- Check compliance monitoring by WCRC staff.
- Responding to community enquiries around water discharge and quality.
- Weekly/monthly infrastructure and pond inspections.
- Data collation and verification by an external hydrologist.

The Stockton water and related environmental monitoring sites are summarised in Table 3.6.

Table 3.6 Current Stockton water monitoring sites

Monitoring type	Sites	Monitoring purpose	Sites with consent compliance limits
Climate	2	Day-to-day management of mining operations and inform environmental assessments.	None
Waterway flow rate & levels	~17	Assess the impacts of mining operations on aquatic ecosystems.	None
Waterway quality	~35	Assess the impacts of AMD on aquatic ecosystems.	13
Groundwater levels & quality	~14	Monitoring impacts from historic underground workings at Millerton Block, and waste rock areas, CFSFs and coastal groundwater. Waste rock seepages are periodically monitored flow both flow and quality.	None
Surface water runoff split into *cleanwater, minewater and stormwater*	~15	Assess water management approaches and potential impacts to receiving waterways.	2
Aquatic ecosystems	~20	Assess AMD impacts.	None

3.8.1.1 Waterway quality

Water quality samples are taken from many sites to assess mining impacts at Stockton. The key current water quality monitoring and Compliance sites in and around Stockton, surface water catchments and major flow paths are shown in Figure 3-14. All current monitoring and Compliance sites, monitoring frequency and further details are provided in Appendix A-1.

Waterway quality monitoring is performed via a suite of offsite and onsite water monitoring points using real-time water monitoring telemetry, daily field sampling by a dedicated Stockton water sampling technician, and field sampling as required for compliance. All field samples are collected and sent to a laboratory for analysis. This monitoring is captured in the 'Stockton Environmental Monitoring Programme'. This programme is continually reviewed, subject to change and maintained by the Bathurst Environment and Community team water specialists.

The default water quality parameters used to assess AMD impacts in Stockton waterways are summarised in Table 3.7.

Table 3.7 Default water quality monitoring parameters in Stockton waterways

Default basic AMD suite	Default comprehensive AMD suite
pH	pH
Electrical Conductivity (EC)	EC
Acidity	Acidity
Sulfate	Sulfate
Dissolved Al, Zn	Dissolved: Aluminium (Al), Zinc (Zn), Iron (Fe), Nickel (Ni), Copper (Cu), Cobalt (Co), Cadmium (Cd), Chromium (Cr), Manganese (Mn), Calcium (Ca), Magnesium (Mg), Dissolved Organic Carbon (DOC)

3.8.1.2 Waterway flow and levels

Stockton waterway flow and levels are monitored at 17 sites Appendix A-1. This includes a mixture of spot gauging and automated flow recorders. Further information is provided in MWM (2026).

Figure 3-14 Current and recent historical surface water monitoring sites at Stockton

3.8.1.3 Groundwater

Groundwater is currently monitored at seven sites at Stockton, six in Millerton Block and one in the Mangatini catchment, plus Bathurst have access to an ex Solid Energy monitoring bore located near the coast. Groundwater levels have also been recorded in geological exploration drill holes over time. In the Millerton Block, more than 440 drill holes have at least one groundwater level measurement. In addition, groundwater levels have been recorded from several monitoring bores installed within underground workings near the down-gradient edge of Millerton pit since 2012. Other monitoring is undertaken on the pore water and seepages from CFSFs as well as waste rock seepages. Currently, significant groundwater monitoring is undertaken at the adjacent Cypress Mine to assess the impacts from opencast dewatering. The current and recent historical groundwater water monitoring sites at Stockton and the adjacent Cypress Mine are shown in Figure 3-15.

3.8.1.4 Aquatic ecosystems

Aquatic ecosystem monitoring is conducted at over 20 waterway sites at Stockton. Monitoring is required to ensure ongoing compliance with the primary Water Right for Stockton (89/38), specifically that mining activities do not cause macroinvertebrate populations to fall below the baseline levels established in 1987. This evaluation relies on annual macroinvertebrate surveys carried out at selected key locations.

3.8.2 Resource consent compliance under Bathurst

Bathurst has numerous water related consents with compliance limits and associated conditions.

Bathurst currently has water quality compliance limits for 13 waterway monitoring sites and a flow compliance limit at one waterway Appendix A-1. Appendix B-1 summarises the compliance at all 14 sites. Appendix B-2 summarises the compliance of other water related consents from the annual compliance monitoring reports between 2021/22 and 2023/24. Overall, the compliance is considered high.

Over the past ten years, there have been three water related consent non-compliance / trigger level notifications to the WCRC (Table 3.8). These relate to minewater discharge to St Patrick Stream and the Ngākawau River and are considered 'Low Risk Non-Compliances'. The actions taken have resulted in improved water quality outcomes.

Table 3.8 Stockton water related consent non-compliance/trigger level notifications to the WCRC in the past ten years

Catchment	Waterway site	Resource consent or water right	Notification ID / Date	Non-compliance / trigger level description	Reported cause	Actions taken
Ngākawau	Ngākawau River	RC01104 / Condition 14	STK ENV #157 / Feb 2020	Discharge to Ngākawau River. pH trigger level of < 4 exceeded. Measured pH of 3.	Water treatment plant failure to function as designed.	Water treatment plant improvements were implemented alongside continued water quality monitoring.
		RC06206 v7 / Condition 22a	STK ENV #158 / Dec 2021	Discharge to Ngākawau River. Turbidity limit breached. Aluminium exceedance 1% of time since.	High rainfall event.	Review the low-density solids discharge procedure.
St Patrick	St Patrick Stream Site S16	RC10256 v5 / Condition 12	STK ENV #152 / Mar 2018	Discharge to St Patrick Stream. 90 day rolling median Acidity7 trigger level of < 80 mg/L exceeded in March 2018. Measured acidity 84 mg/L.	Low summer stream flows. 1 in 25-year event.	Ongoing monitoring.

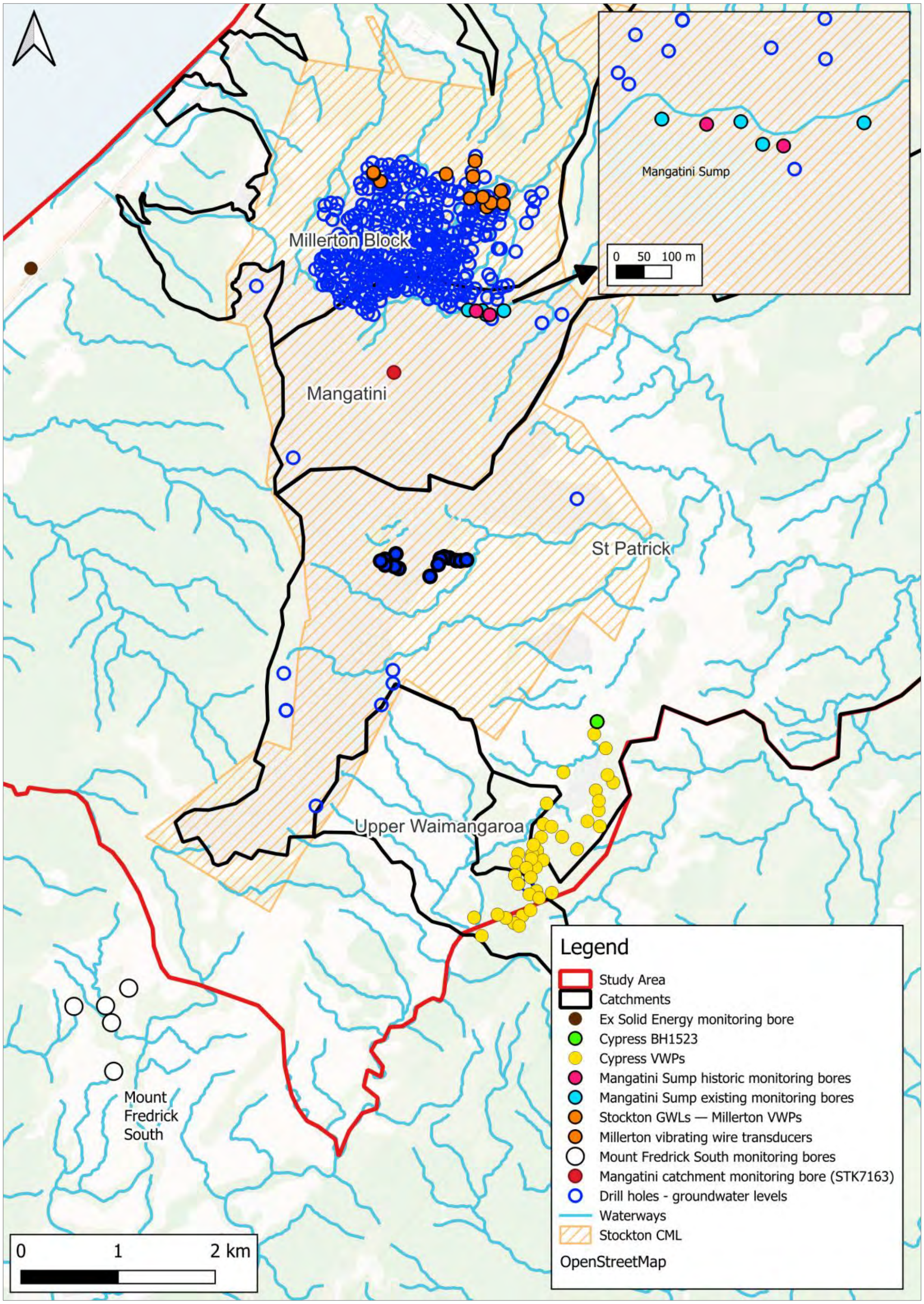


Figure 3-15 Current and recent historical groundwater water monitoring sites at Stockton and the adjacent Cypress Mine (source: GHD, 2026)

4. Proposed works with the BPCP and required consents

The section outlines the proposed future water management at Stockton through mining, rehabilitation and closure phases. Long-term, it is important to note that active treatment will be required for decades post-closure due to both historic and proposed mining.

4.1 Buller Plateaux Continuation Project

Many Stockton water-permits expire along with the CML in March 2027. Replacement regional consents are needed for continued operations water treatment and rehabilitation. The proposed BPCP would operate for a 35-year Term (covering a nominal period from 2027 – 2062) and consist of:

- Operation phase mining until Stockton coal runs out: 2027 - ~2033.
- Receival / processing of coal and receival / disposal of potentially acid forming rejects from other BPCP sub-areas: 2027 - ~2042.
- Receival of Mussel shell sludge from ESC in Millerton: 2027 - > 2062.
- Land rehabilitation (physical works): 2027 - ~2046.
- Mine closure: 2046.
- Post-closure monitoring, [redacted]
- Continued AMD management: Likely beyond 2062.

In the Stockton project sub-area, Bathurst proposes to mine additional areas in the north of Stockton, continue using the existing infrastructure and facilities, carry out further quarrying activities in the A Drive Quarry, and develop three additional CFSF. Most of the continued mining for Stockton will occur at Millerton. As such, this area is the focus of future AMD management and rehabilitation. Under the BPCP, approximately half the historic underground workings (relative to pre-opencast 2010 areas) will be mined out with waste rock being used to construct the Millerton ELF. This is a major reduction in existing AMD contribution since the historic underground and open cast coal workings are by far the largest AMD source.

Once remaining Stockton resources have been mined (~2033), Bathurst will continue to use the Stockton coal handling / processing facilities and water treatment infrastructure to support the wider Buller Plateaux mining and carry out AMD management and rehabilitation to improve the waterways.

A key positive outcome of the BPCP is the greater length of time for Bathurst to actively contribute to the long-term AMD liability through land rehabilitation, water treatment and partnership with the Crown to address the legacy issues. Without the BPCP and associated water treatment, a significant regression in waterway quality would be expected, unless the Crown undertakes ongoing water quality management equivalent to that currently in place.

4.1.1 Approvals sought

Bathurst (and its subsidiary companies as appropriate) are seeking water related approvals for a 35-year Term (2027 – 2062) under the FTAA to allow continued mining and water treatment at Stockton. The water rights sought for Stockton focus on managing AMD and improving water quality within the context of supporting the agreed long-term

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[2] [redacted]

solution for overall water quality improvement on the Stockton Plateau. The planned operations are designed to improve water quality and freshwater ecosystems during the extended operational phase and mine through current legacy sources of AMD with rehabilitation on completion.

While the mine is in operational, closure and/or post-closure phases, it is considered advantageous to align, where possible, future consent expiry dates and the monitoring for compliance conditions.

A full description of the approvals sought is provided within the application.

4.1.2 Future water management plans

Table 4.1 summarises the future Stockton water management plans that are key in supporting the BPCP proposal and long-term environmental objectives.

Table 4.1 Future Stockton water management plans key in supporting the BPCP proposal and monitoring programmes

Key future plans supporting the BPCP	Description
Stockton Water Management Plan STO-ENV-PLN-013 v2.0 (Bathurst, 2026g)	This management plan sets out how surface water, stormwater and minewater, including acid and metalliferous drainage, are managed, treated, monitored and reported across ongoing operations and the transition to mine closure under the Fast-track Approvals Act process. It defines the regulatory framework, risk controls, monitoring programmes and responsibilities needed to manage the high-rainfall catchments, protect downstream waterways and support long-term rehabilitation and closure outcomes.
Stockton AMD Environmental Management Sub Plan v2.2 (Bathurst, 2024h).	This sub plan includes the following two key documents:
	1) Stockton Operational AMD Sludge Management (Bathurst, 2025b) This report covers sludge management across all of Stockton and the management plans for Mangatini Sump listed below: – Mangatini Sump Management Plan (GHD, 2018) – Mangatini Sump Management Plan - Council Update (GHD, 2024)
	2) Rehabilitation and ELF Management Plan
Mangatini Sump Management Plan (GHD, 2018)	The plan defines an adaptive operating and monitoring regime for the Mangatini Sump to manage acid mine drainage and low-density sediment accumulation while maintaining downstream water quality and compliance with resource consent conditions. It documents the outcomes of operational trials and sets out flow-based diversion, sediment discharge, sludge management, monitoring, and maintenance measures to support continued operation. This document was provided in support of a discharge consent variation that was approved in 2018 and associated with the reviews undertaken every 2 years and reported to WCRC.
Millerton Block AMD Water Management Plan STO-ENV-PLN-027 (Bathurst, 2025d)	Developed as part of the BPCP. This plan complements existing Stockton Environmental Management Plans and Sub-plans but provides Millerton Block specific details and some supporting assessment of environmental impacts.
Coal Fines Storage Management Plan - BPCP STO-ENV-PLN-028 (Bathurst, 2026d)	Outlines the objectives, risks, management controls, responsibilities and training requirements to effectively manage CFSF and their effects.
Operational Environmental Management Plan (OEMP) for Ngākawau STO-ENV-PLN-029	The OEMP includes aspects of existing water and dust management plans for Ngākawau.

4.1.3 General approach to water management

Operational water management structures will be retained and maintained until the associated catchments are considered fully rehabilitated and water quality meets the defined rehabilitation completion criteria. AMD management will be an important final land use activity due to the scale of the legacy AMD from mining going back to the 1880's. Agreements are in place to enable the Crown, under the administration of LINZ, to assume control of AMD water treatment systems post closure at Stockton Mine (excluding Cypress).

Infrastructure to enable this work to be continued are contractually required to be left in place and this is a significant consideration for closure scheduling and planning (and includes water treatment by-product / floc disposal). It is anticipated that both active and passive water treatment systems will be required for the long-term management of AMD. These treatment systems will remain in place and be maintained for several decades, or until AMD loadings decrease to levels that are considered environmentally acceptable. This longer-term management will be undertaken by the ongoing Crown project in partnership with BT Mining and Ngati Waewae to optimise a long-term solution for AMD management at Stockton (The Treasury, 2025a).

For passive treatment systems that may be decommissioned in shorter timeframes, Bathurst will undertake monitoring and maintenance to confirm that water quality meets agreed criteria. Once regulatory confirmation / approval is obtained, this infrastructure may be decommissioned and removed. The areas will then be re-contoured to align with the approved final landform (Figure 4-5).

4.1.4 AMD sludge management

Future management of sludge at Mangatini Sump, McCabes Sump, the proposed Millerton MW16 Sump and Whirlwind Stream MSR are outlined below. A detailed description of these activities is provided in Bathurst's Stockton Operational AMD Sludge Management report (Bathurst, 2025b).

Mangatini Sump and related sumps

Mangatini Sump is currently managed under the Mangatini Sump Management Plan (GHD 2018; GHD 2024). This plan will be updated in 2026, as part of the currently consented two-year review cycle.

New consents for the Mangatini Sump are being sought through the FTAA application. Bathurst continues to refine the operation of the Mangatini Sump to improve the process for managing LDS. Based on monitoring data associated with the discharge events completed in the last 2 years there is no plan to significantly alter the discharge procedure at this point in time. Bathurst has maintained the LDS levels such that inflows are equivalent to outflows and are working to continually improve the freeboard levels (Bathurst, 2025b).

Bathurst has started lime dosing upstream of larger sediment sumps such as Mangatini Quarry (mid 2023 onwards), Mumms Sump (to start in 2026) for LDS capture and removal to provide additional capacity. These structures provide primary settling for sediment and AMD precipitates with the sediment removed using diggers and trucks as required (Bathurst, 2025b). During the operational mining and rehabilitation phases at Stockton, AMD sludge generated from the filter beds (slops) and captured in Mangatini Quarry / Mumms Sumps will be co-disposed with overburden in the Millerton waste rock areas until Millerton is rehabilitated, after which, AMD sludge will be moved offsite, as described in the Stockton Operational AMD Sludge Management report (Bathurst, 2025b).

McCabes Sump

The McCabes sump will likely need desludging starting in 2030 where it will be pumped to filter beds for dewatering. The dewatered sludge will be excavated, trucked and then disposed of in sediment/slop cells[3] located within the ELFs to the end of rehabilitation in 2046. After 2046, some slop cells, if required, will remain open for the post closure period (Bathurst, 2025b). After 2047, the rehabilitation of ELFs at Stockton is anticipated to have been completed and co-disposal of AMD sludge can no longer occur.

[3] Slop cells are engineered containment areas within overburden areas where pond and road sediments can be disposed of without affecting the overall waste rock stability or function.

Instead, AMD sludge will be retained in final landform slop cells, sumps, filter beds and, if required, dewatered further by mechanical processes and/or passive systems such as Geotubes (Bathurst, 2025b).

Whirlwind MSR

The Whirlwind mussel shell reactor has been operating since 2012 passively treating ~10 tonnes/yr of acid in the Whirlwind stream. Currently there is ~150 m^3 of AMD sludge generated every 5 years from the Whirlwind Mussel Shell Reactor (MSR). The proposed current management plan for the AMD sludge is disposal to slop cells. However other options will be investigated and may be considered, subject to further trials and approvals (Bathurst, 2025b).

Proposed Millerton MW16 Sump

From 2033 to 2046, minewater from the Millerton ELF will be captured in the ~700,000 m^3 volume MW16 Sump, then pumped to Mangatini Sump for treatment.

From 2047, it is proposed that Millerton AMD will be treated directly in the MW16 Sump using automated MgO slurry dosing, with dose rates based on water pH. All MW16 Sump flows will receive MgO dosing, with flows up to the 90th percentile diverted into MW16 Sump to capture AMD precipitates. During higher flow events (>90th percentile) excess flows will bypass MW16 Sump like the Mangatini Sump bypasses. Controlled AMD sludge discharge from MW16 Sump to Mine Creek is not proposed, though consent for LDS discharge from Mangatini Sump will be retained. Projections indicate that by 2106, MW16 Sump will generate about 313,000 m^3 of AMD sludge, which is well below the sump's storage capacity of ~718,900 m^3, so no additional AMD sludge management measures are needed for MW16 Sump (Bathurst, 2025b).

Disposal of dewatered sludge from filter beds in Slop Cells

AMD sludge from Stockton's filter beds will be co-disposed with overburden in ELFs until 2047, with all sludge disposal cells located upstream of treatment sumps to ensure any leachate is captured and treated. While there is some risk of contaminant leaching from LDS co-disposal, the relative volume of AMD sludge compared to PAF material volumes means the overall risk of contaminant mobilisation is considered low (Bathurst, 2025b).

Slop cells are constructed to a maximum height of around 7 metres, with placement from greater heights requiring concrete barriers, ensuring alignment with standard ELF plans. These cells are placed at least 10 metres from ELF edges to reduce the risk of erosion and seepage and are wide enough to allow perimeter access for efficient filling (Bathurst, 2025b).

Once ELF rehabilitation is completed (~2037) and co-disposal of AMD sludge (with waste rock) can no longer occur. AMD sludge will be retained in final landform slop cells, sumps, filter beds and, if required, further dewatered using mechanical processes and/or passive systems such as Geotubes (Bathurst, 2025b). Post 2047 AMD sludge management is subject to optimisation by the Crown.

4.1.5 Rehabilitation

Rehabilitation will be completed progressively using techniques which have already proven to be successful for rehabilitation at Stockton. The rehabilitation will optimise the use of natural material including VDT, topsoil and slash material. Completion of capping and management of waste rock activities which in conjunction with terrestrial rehabilitation will reduce the overall AMD generation at Stockton by ~50% (Okane 2015). Additional rehabilitation area to the 503 ha as of 2025, is planned for future restoration.

Figure 4-1 shows the rehabilitation staging proposed to 2046 (with indicative timing based on the timing of approval and works underway). This plan also includes an area known as the Northern ELF that is part of the Cypress operation.

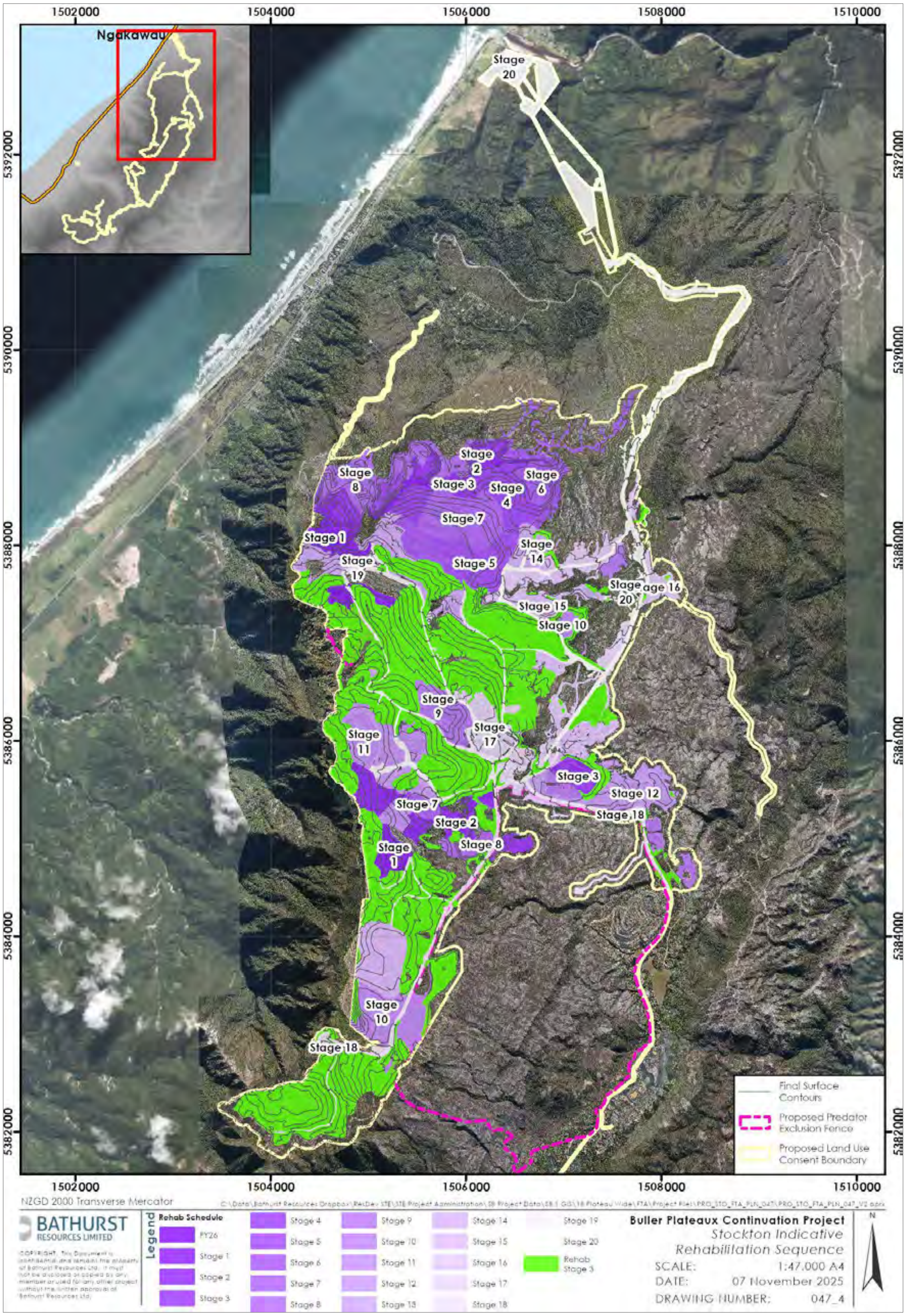


Figure 4-1 Indicative Stockton Mine rehabilitation schedule to 2046

Engineered Final Landforms (ELFs)

As mining through historical underground workings, fires and opencast areas continues, these sources of historic AMD are removed. The PAF waste rock generated from this mining is used to construct engineered final landforms (ELFS). These are carefully designed to ensure stability, reduce oxygen and water ingress into the overburden, minimise AMD and provide for the capture of any leachate for treatment. The ELFs are reshaped to blend with the natural landscape and are revegetated as part of the mine's rehabilitation process. At Millerton, ELF construction methodologies (e.g., reduced lift height) will replace the encapsulated waste rock areas approach that is currently applied at Stockton.

4.1.6 Overburden from the BPCP sub-areas

Overburden containing PAF material from the UWHR (i.e. where earthwork cuts required to remove PAF material to construct the haul road) and Cypress BPCP project sub-areas is proposed for disposal at Stockton. The placement of this material would occur within the existing Stockton overburden and water management framework, which includes long term water capture, monitoring, and treatment infrastructure intended to manage AMD associated with both legacy and proposed mining activities across the Stockton and Cypress sub-areas.

4.1.7 Mangatini catchment

Future water management strategies to reduce AMD in the Mangatini catchment will use existing infrastructure. In summary this will include:

– Ongoing AMD treatment through lime dosing to Mangatini Sump (LDP1).
– Ongoing AMD collection from across the catchment, diverted to Mangatini Sump and discharged to Mangatini Stream after treatment.
– Completion of final landform rehabilitation, which will contribute to an ~19% reduction in acidity loads / concentrations across the catchment compared to 2025 values (i.e., 50% reduction in acidity loads / concentrations from the 38% of the catchment not yet rehabilitated). Rehabilitation is scheduled to occur at varying rates to 2037.
– Additional AMD treatment in Mangatini Sump with AMD impacted water diverted from the Millerton Block from 2027 – 2047. This additional water will be discharged to Mangatini Stream (further discussed in Section 0).
– A limited area of historical underground workings will remain, contributing untreated AMD to Mangatini Stream.

4.1.8 Millerton Block

4.1.8.1 Overview

The Millerton Block is currently, and was also historically, the most AMD impacted catchment at Stockton. It also has the most future mining of any area at Stockton. As such, a significant amount of recent work was undertaken as part of the BPCP to develop the **Millerton Water and AMD Management Report** (Bathurst, 2026a) and **Millerton Water and AMD Management Plan** (Bathurst, 2026f). The objectives of these two key documents are as follows:

– Millerton Water and AMD Management Report:
    - Use the proposed mine plan to develop an AMD model to define water quality objectives (including Betterment), determine treatment needs, and to forecast acidity loads and impacts on key water quality monitoring sites across three project phases:
        – Operation (2027 – EOML)
        – EOML (2033 – 2046)
        – Closure (2047 onwards)
    - Recommend ways to manage ongoing AMD impacts including the use of adaptive management.
– Millerton Water and AMD Management Plan:

- Ensure that generation of AMD impacted water is prevented, minimised, and/or treated in accordance with the proposed conditions of consent to minimise environmental impacts, reduce ongoing environmental liabilities, and to ensure that statutory and non-statutory discharge limits are achieved.
- Ensure infrastructure is appropriately designed and fit for purpose, covering design needs in the short-term, long-term and for permanent landforms.
- Provide specific water management measures for the Millerton Block to improve environmental outcomes.

4.1.8.2 Water management strategy and proposed works

Water management initiatives within the Millerton Block over the Term of the BPCP is broken into three distinct phases shown in Figure 4-2 to Figure 4-4 and summarised in Table 4.2. A full description is provided in the Millerton Water and AMD Management Report (Bathurst, 2026a).

Table 4.2 Millerton Block water management phases summary

Phase	Proposed start date	Proposed finish date	Key mining activities	Key proposed works
Operation (Figure 4-2)	1 April 2027	2033	Continued opencast mining with associated coal and overburden extraction	– AMD impacted water captured in pit sumps and pumped to Mangatini for treatment – Construction of final landform AMD management infrastructure (e.g., Millerton ELF, AMD collection drains, Pit Sumps)
EOML (Figure 4-3)	2033	2046	None	– AMD impacted water captured in pit sumps and pumped to Mangatini for treatment – Complete rehabilitation. This includes: • Final landform shaping. • Capping and topsoil spreading. • Vegetation planting or VDT.
Closure (Figure 4-4)	2047	Onwards	None	– Lime dosing of MW16 Sump AMD from 2047.

Further information on the key water management strategies and works proposed at each phase are summarised below.

4.1.8.2.1 Operation phase (2027 - 2033)

Activities that will contribute AMD:

- Ongoing fire suppression through to 2028 using untreated AMD impacted water from Millerton opencast pit.
- Highwall and coal floor exposure during opencast mining.
- Twins Pit sump spill water may contribute to AMD discharge from infrequent overflow events during rainfall greater than the 95th percentile.

Activities that will improve water quality:

- Ceasing fire suppression discharge to underground workings from 2029 onwards.
- Ongoing opencast mining will result in ~187 ha of underground workings being mined out by EOML, a reduction from ~370 ha pre opencast (2010) to ~183 ha at EOML (Bathurst, 2026a). Since historic underground workings are the main source of AMD, this will have a significant benefit to the long-term water quality in waterways receiving discharges from these workings.
- During vegetation stripping and construction of the main sumps, stormwater will be collected in sediment treatment systems to manage receiving waterway TSS and turbidity and discharged back to the natural catchment. This includes:

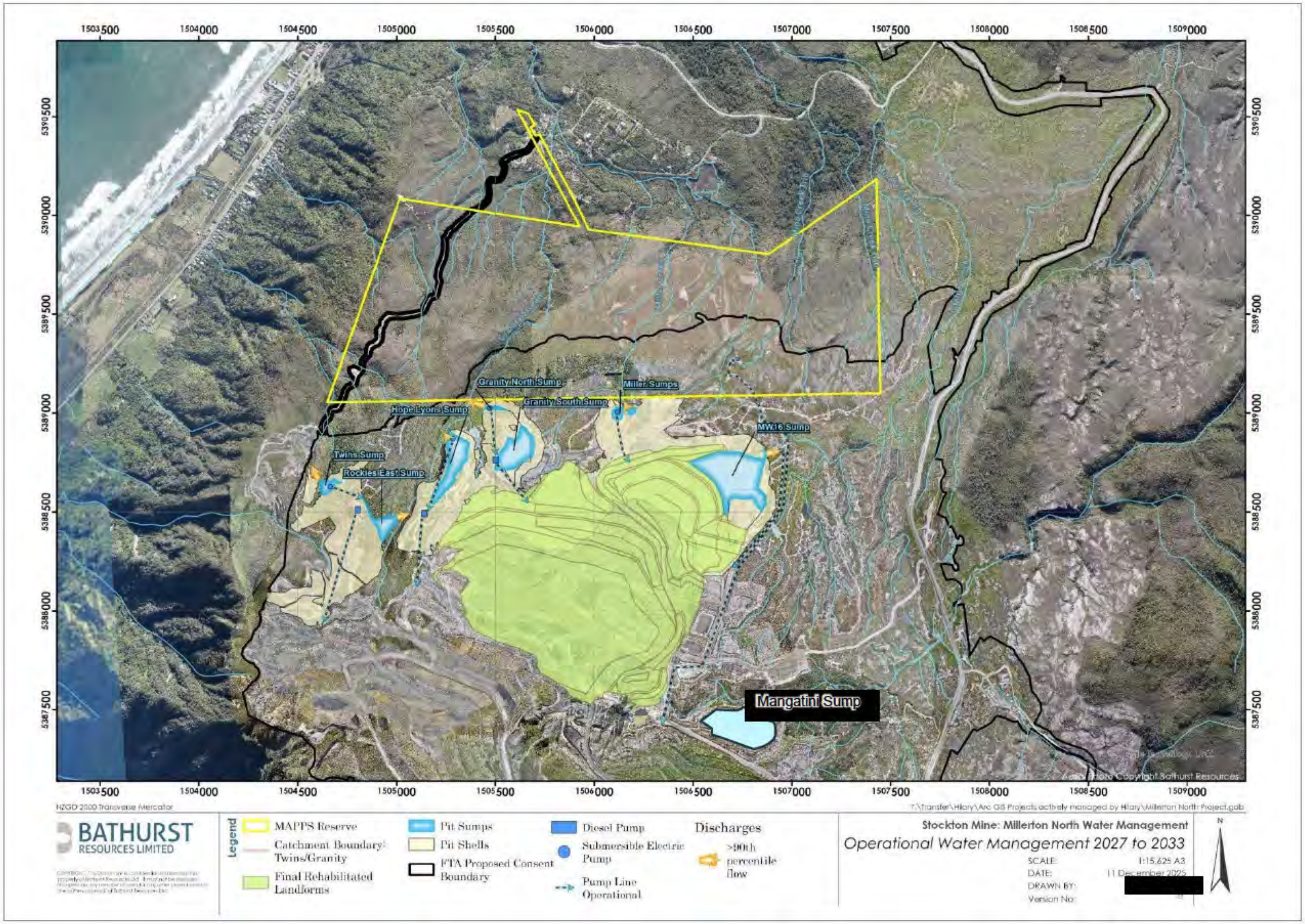


Figure 4-2 ***Operation phase water management (2027 – 2033) (source: Bathurst, 2026a)***

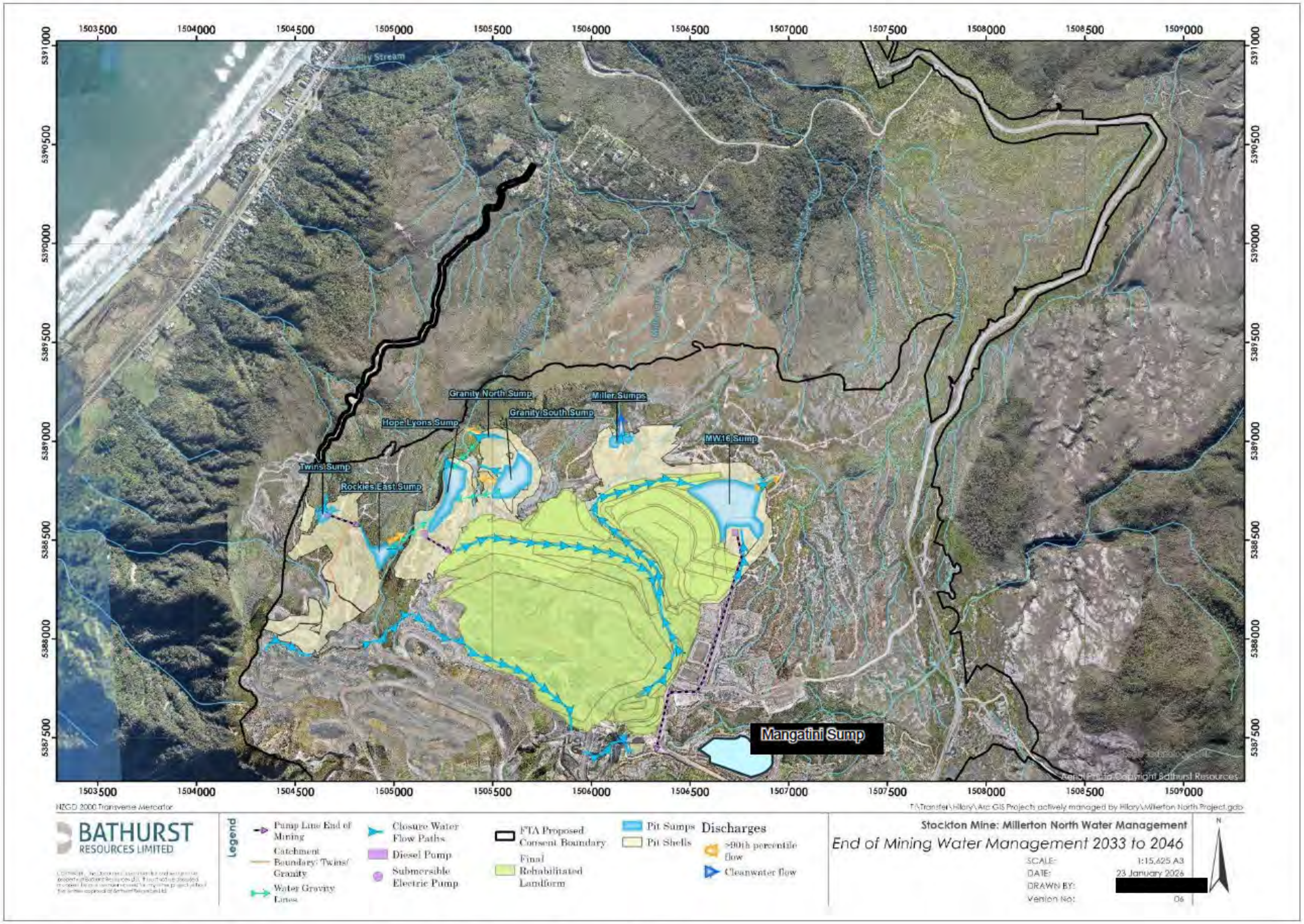


Figure 4-3 ***EOML phase water management (2033 – 2046) (source: Bathurst, 2026a)***

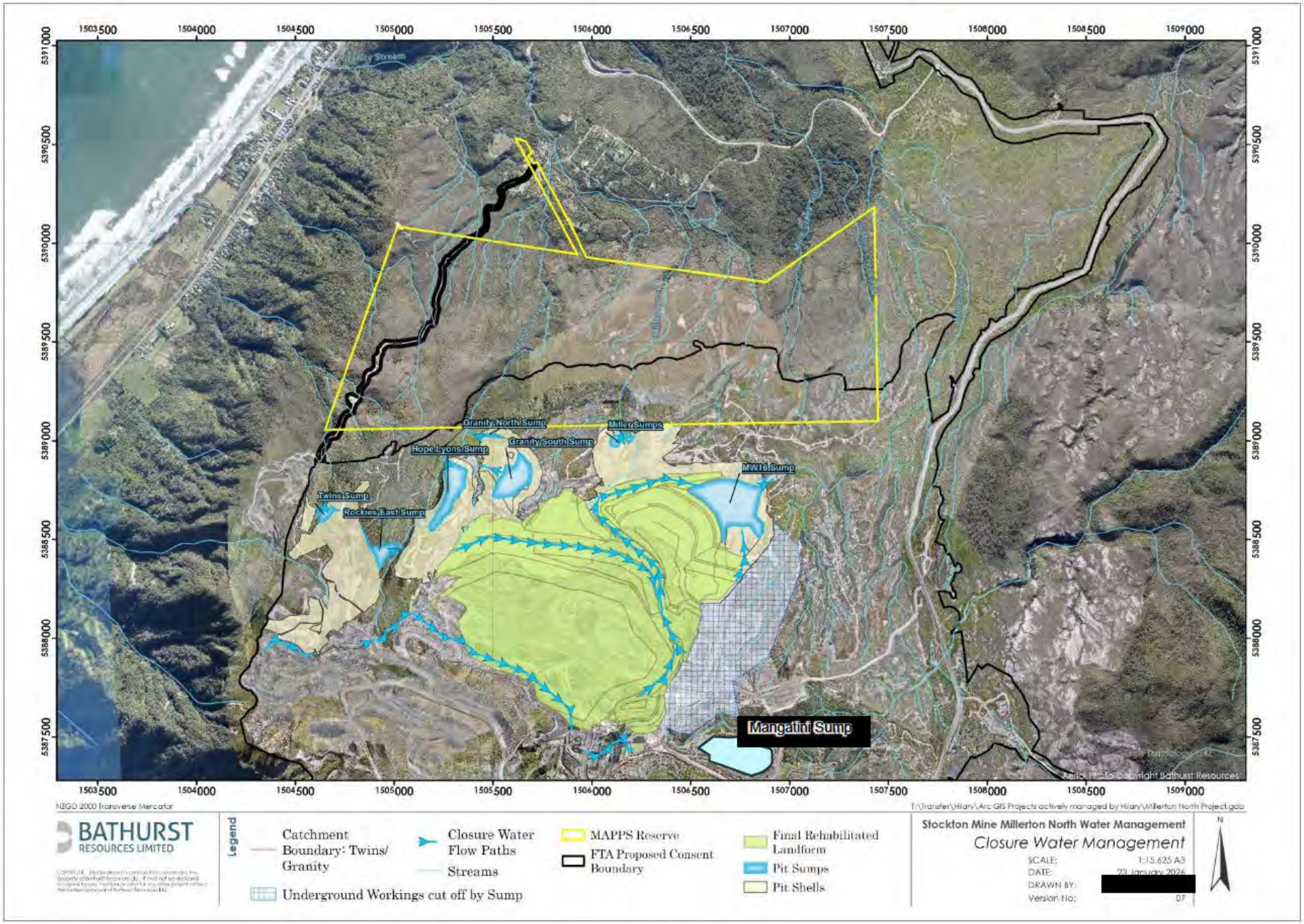


Figure 4-4 *Closure phase water management (2047 onwards) (source: Bathurst, 2026a)*

  - >90th percentile flow discharges of AMD impacted water from Twins Sump to Twins Stream, Hope Lyons, and Granity Sumps to Granity Stream a Miller Sump into Miller Stream.
- Construction of final landform AMD management infrastructure (e.g., Millerton ELF, AMD collection drains, Pit Sumps). The Millerton ELF will incorporate additional AMD minimisation techniques and staged rehabilitation (completed by 2046) including ~125 ha granite (NAF material) capping and rehabilitation of 'native ecosystems' across all PAF stored in Millerton ELF.
- Increased AMD recovery (including fire suppression water) from the Drainage Control Adit (DCA) stopping and transfer to the Mangatini Treatment System for treatment at Mangatini Sump from 2026 to 2028 will improve Mine Creek water quality (until the Syncline area is mined out by the end of 2028 and AMD capture transitions to MW16 Sump).
- Sealing portals near pit sumps to prevent the sumps from draining into underground workings and sealing the ELF to reduce oxygen and AMD production.

4.1.8.2.2 EOML phase (2033 - 2046)

Activities that will improve water quality:

- Completion of the Millerton ELF.
- Up-gradient overland flow paths directed to MW16 Sump for treatment.
- Captured AMD impacted water in pit sumps pumped to Mangatini catchment for treatment.
- Continued use of Mangatini Sump for Millerton AMD treatment / LDS management until 2046 while rehabilitation occurs and MW16 Sump acidity loads are in a rapid decay phase.
- Complete rehabilitation including final landform shape, capping and topsoil spreading, vegetation planting or VDT.

4.1.8.2.3 Closure phase (2047 onwards)

Activities that will improve water quality:

- Cutoff, capture and treatment of AMD from ~42 ha of historic underground workings east of Millerton ELF.
- Lime dosing of MW16 Sump AMD from 2047.
- Final landform design strategy minimising the footprint of Millerton ELF and leaving coal floor and highwall areas permanently exposed. This final landform design strategy:
  - Minimises the footprint of Millerton ELF, reducing potential AMD seepage volumes.
  - Incorporates highwall / coal floor surfaces in the final landform with relatively low AMD generation long-term.

4.1.9 St Patrick catchment

Future water management approaches to reduce AMD within the St Patrick catchment during the Term of the BPCP will largely utilise the current water treatment infrastructure and include:

- Ongoing AMD treatment through lime dosing to McCabes Sump LDP2 (main water treatment infrastructure).
- Ongoing rehabilitation to be completed by 2037.
- Construct and commission an additional diversion weir in Plover Stream in 2033/34 to divert up to 70th percentile Plover Stream flows to McCabe Sump for treatment – whereas currently there is no treatment on Plover Stream.
- Optimise the McCabes Sump to treat more Fly Creek and Plover Stream AMD once the Cypress project is fully rehabilitated by ~2033.

Increased acidity loads reporting to McCabes Sump for treatment from Cypress are anticipated through the remaining Cypress mine life through to 2033. However, effective operation of capture sumps and pump / pipelines has resulted in a significant reduction in acidity loads to St Patrick Reservoir as key AMD sources are diverted to LDP2 / McCabes Sump. As such, these additional loads are not expected to cause deterioration in St Patrick stream water quality.

Opencast coal mining in the A Drive area (upper St Patrick catchment) will finish by 2028. The PAF overburden material generated from the opencast mine will be placed in nearby ELFs and include capping of the completed A18 CFSF tailings dam. ELF rehabilitation will occur at different stages. Cleanwater will be diverted from work areas in the opencast pit to prevent erosion, while minewater will be treated in local sumps before going to the LDP2 facility. Water from the A Drive quarry will be pumped into existing minewater pathways, treated in settling ponds, and finally processed at the LDP2 facility before leaving the site.

Water and contaminants (including coal fines) from the CHPP will be discharged to land at three new Coal Fines Storage Facilities (A-Drive CFS#1, CFS #2 and CFS #3).

AMD discharges into St Patrick Stream from the historic Fly Creek Underground Mine located downstream of the current AMD treatment infrastructure (McCabes Sump) and will remain untreated. Surface runoff from the UWHR haul road (including its passage through the Cypress catchment) is currently discharged to the St Patrick catchment. This will continue until closure, after which a narrowed haul road will remain open for ongoing monitoring and maintenance purposes and natural catchments will be reinstated.

4.1.10 Upper Waimangaroa catchment

No change to the current water management in the Herbert and Whirlwind Streams (that flow into the Upper Waimangaroa River) are proposed under the BPCP, other than what may be achieved through final landform construction and rehabilitation. The passive Whirlwind MSR treatment system, commissioned in 2012 to treat one of the AMD seeps reporting to Whirlwind Stream, will continue to operate with periodic maintenance. This system has resulted in variable improvements in downstream water quality, depending on the relative flow rates of other uncaptured AMD seepages and MSR performance. AMD seepage to Herbert Stream (currently untreated) is being assessed as part of the LINZ led AMD management optimisation project for future treatment, but no new treatment activities are proposed under the BPCP.

4.1.11 Mine closure and beyond

Active treatment of AMD will continue when LINZ administration of the site under the Crown commences. This includes AMD treatment in:

- Mangatini catchment via LDP1 and Mangatini Sump.
- Millerton Block via LDP1 and MW16 Sump.
- Lower Millerton Block, capturing underground workings utilising LINZ infrastructure (not included in this BPCP application).
- St Patrick catchment via LDP2 and McCabes Sump.

It is forecast that ongoing active treatment and LDS management will be needed to support the 80-year recovery plan for aquatic ecosystems.

4.1.11.1 Final landform

The proposed final closure outcome at Stockton will involve the development of constructed rehabilitated landforms that achieve natural / native ecosystems (both vegetated and rock field) sympathetic to surrounding natural landscape on the Stockton Plateau. The final landform includes ~1,428 ha of rehabilitated land and water infrastructure used for continued treatment and improvement of waterway quality. Post-closure, water management will be required at the site for an extended period to ensure ongoing legacy AMD is managed. The indicative final proposed landforms are shown in Figure 4-5.

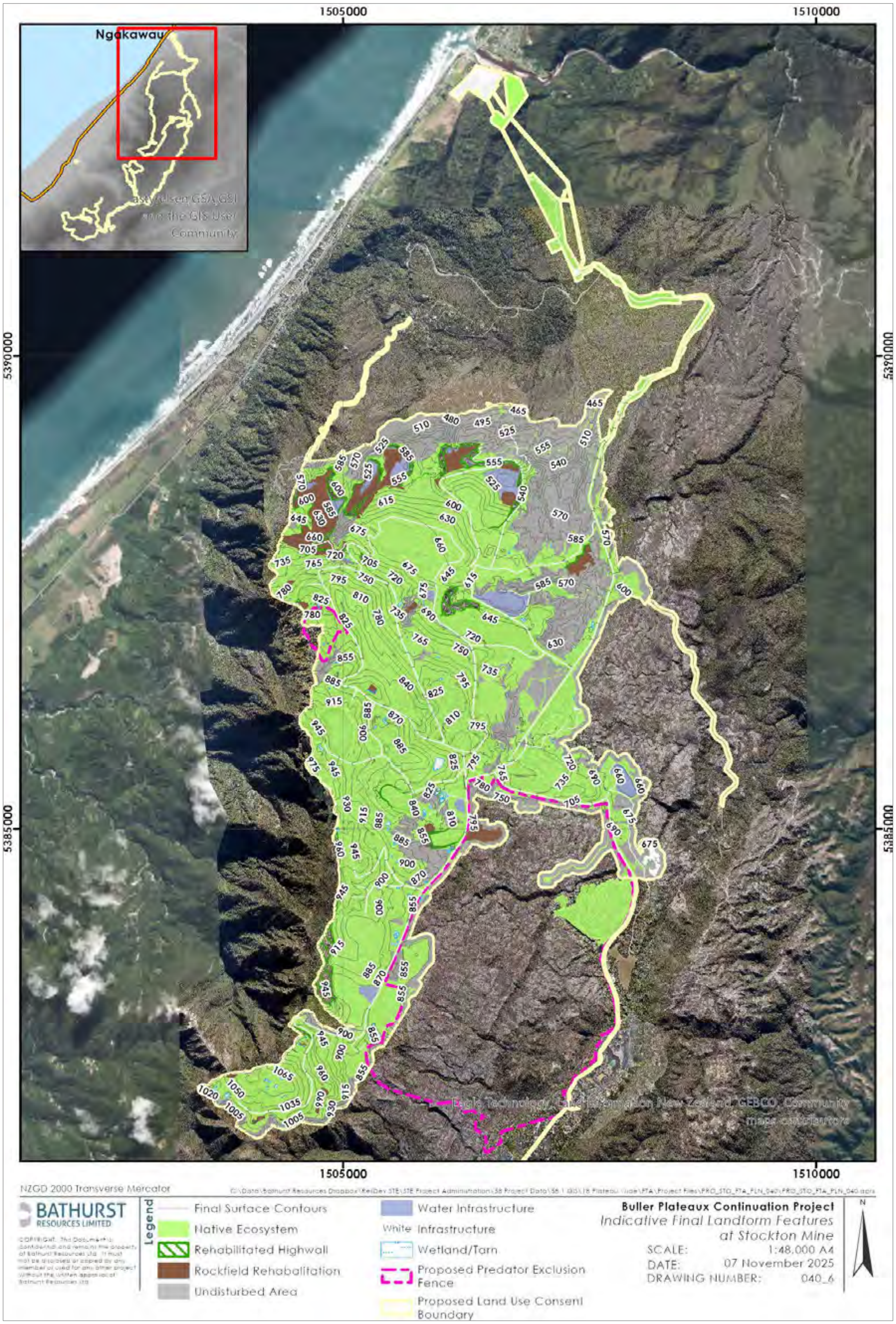


Figure 4-5 Indicative final landform

4.1.11.2 Remaining historic underground workings

Historic underground workings contribute more AMD to waterways than any other source. Continued opencast mining at Millerton under the BPCP is beneficial as it will remove more workings and therefore reduce this source. However, some historic underground workings will remain post closure as shown in Figure 4-6, both within and outside the proposed consent area and CML.

The remaining underground workings mostly occur within the Miller and Mine Creek surface water catchments which form part of the wider Millerton block. There will also be some remaining historic underground workings in the Mangatini catchment and within the St Patrick catchment where the historic Fly Creek underground workings occur both within and down-gradient (outside) of the CML.

Future activities under the BPCP that will reduce the AMD from remaining underground workings will include:

- Sealing portals near pit sumps and ELFs. This includes the sealing of DCA Adit (underground workings tunnels) which is currently the largest AMD impacted groundwater discharge to any Stockton waterway.
- Cutting off ~42 ha of remaining underground workings that would naturally discharge AMD into MW16 Sump.
- Reduction in fire suppression to reduce loads flushed from the remaining workings.

Solid Energy attempted to fill up underground voids with grout/cement in Millerton at Stockton, and at Strongman Mine north of Greymouth for 4 – 5 years with no success. The main issue was the shallow collapsed nature of the rock above the mined coal making it impossible to seal underground workings from oxygen and water to reduce AMD and fires ([redacted] pers. comm, 4 March 2026).

4.1.11.3 AMD sources not covered by the BPCP

Areas of historic underground workings will remain post closure (Figure 4-6). An agreement between BT Mining and MaPPS under which BT Mining has undertaken not to mine part of the CML area means that open cast mining and subsequent removal of more underground workings north towards Millerton Township cannot occur. The Crown (via LINZ) management of remnant historic underground workings outside the opencast disturbance footprint and proposed consent boundary are not included in the BPCP. However, LINZ is expected to pursue future consents to address these and other historic AMD sources downstream of the proposed consent area.

4.1.11.4 Water management beyond the BPCP

Beyond the BPCP, the Millerton Block water and AMD management infrastructure will assist LINZ in partnership with Ngati Waewae and local councils to manage AMD in the longer term. In addition, LINZ on behalf of the Crown is currently optimising long term historic AMD treatment (The Treasury, 2025a).

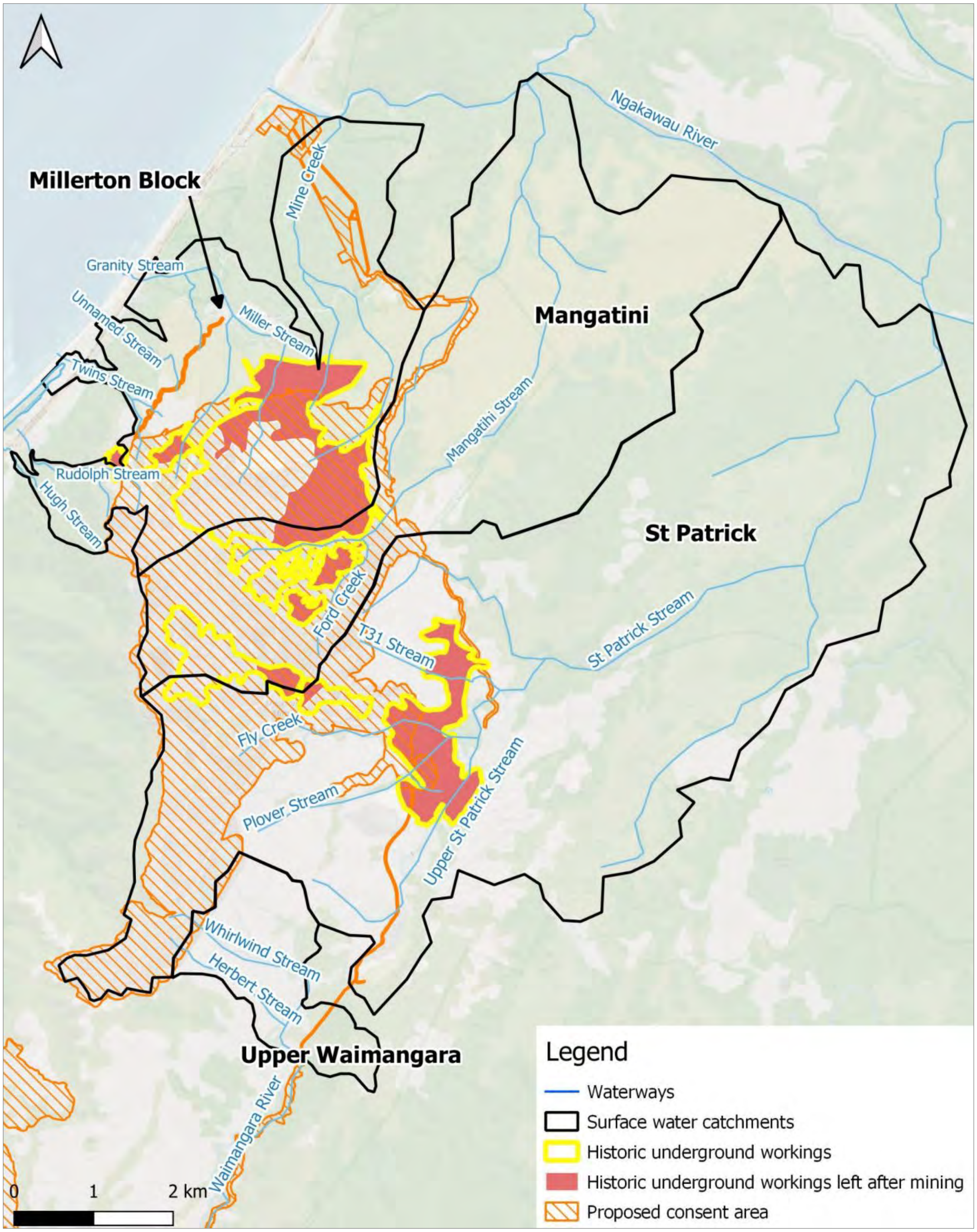


Figure 4-6 ***Historic underground and estimated remaining historic underground workings after mining***

5. Current (baseline) impacts

Surface water and groundwater within the Stockton Plateau, especially within the KMS and BCM, has been progressively altered over a period of 130 years due to mining, commencing with underground coal mining back in 1896, and opencast mining from 1944. The cumulative effects over time mean that the current baseline conditions over much of the Stockton Plateau, especially within the CML, represent a modified (non-natural) state.

This section describes the current state of waterways, water quality and the impacts (potential and observed) from mining at Stockton, on aquatic ecosystems and both surface water and groundwater users. The full impact assessments are provided in:

– Aquatic ecosystems: *Buller Plateaux Aquatic Ecology: history, thresholds and long-term management* (Instream, 2026).
– Hydrology: *Hydrological assessment. Buller Plateaux Continuation Project* (MWM, 2026).
– Groundwater: *Hydrogeology of the Stockton area and the assessment of impacts on groundwater from BPCP Stockton mining activities* (GHD, 2026).

5.1 Impacts from other mining areas

5.1.1 Cypress

The boundary between the Ngākawau and Waimangaroa catchments fall roughly across the Cypress mining area (Figure 2-5). The Cypress consent boundary intersects the St Patrick catchment in the north and Upper Waimangaroa catchment in the south (Figure 2-6). Key features at Cypress are the existing North Pit, Northern Engineered Landform (NELF) (ex-pit), and the proposed South Pit.

Existing cleanwater diversions ensure no AMD impacted Cypress water enters the Upper Waimangaroa River which instead, is intercepted and routed north into the St Patrick Stream.

Cypress Mine disturbance to the east of Stockton has increased significantly since 2017 with open-cast mining in the North Pit nearing completion and development of the South Pit underway. AMD from the Cypress North Pit (up to 400 L/s) and NELF (up to 80 L/s) is captured in sumps and pumped to McCabes Sump in the St Patrick catchment for lime dosing treatment at LDP2 (Section 3.6.4), before being discharged into Fly Creek, a tributary of St Patrick Stream.

During high flow conditions when McCabes Sump inflow exceeds pit sump pumping capacity, the Cypress Pits store excess AMD for later treatment as opposed to being bypassed / discharged into the Waimangaroa River. The NELF AMD collection sumps occasionally spill excess AMD water to St Patrick Reservoir and discharging via a pipeline to St Patrick Stream just above the point where St Patrick Stream drains into the historic Fly Creek underground workings.

5.1.2 Charming Creek Coal Mine

Historic underground coal mining within the Charming Creek catchment is a current source of AMD to the Ngākawau River. The creek has a relatively large flow (compared to most Stockton waterways) and discharges into the Ngākawau River ~350 m upstream of the Mangatini Stream confluence (Figure 2-6).

Underground coal mining at Charming Creek occurred from 1922 to 1986. Golders (2002) note that the water quality at monitoring site CC1 in the lower Charming Creek shows minor AMD impact with maximum dissolved concentrations of aluminium (0.39 mg/L), zinc (0.19 mg/L) and sulphate (58 mg/L). However, pH was in the range 4.9 to 7.2 and macroinvertebrate species included [redacted] Overall, Charming Creek water quality is within the threshold that would support aquatic ecosystems, i.e., dissolved aluminium < 1 mg/L Table 5.4. However, given the dissolved aluminium concentration at Charming Creek (0.39 mg/L) is relatively high compared to NR (median 0.2 mg/L in 2024/25), AMD loads from Charming Creek appear to have the potential to contribute elevated concentrations of trace elements into the Lower Ngākawau River.

5.1.3 Rockies Coal Mine

Rockies Coal Mine is located on the crest of the Granity Escarpment (Millerton Block), south of Twins Stream head waters (Figure 5-1). The mine was operated by the Westport Main Coal Company from 1924 - 1934 working coal outcrops at the edge of the plateau using opencast and underground mining techniques (REM, 2010). From 1935 - 2010 all mining stopped. Opencast mining recommenced from 2010 – 2013 under Rockies Mining Ltd who hold a 40-year coal mining permit, valid from 2010 - 2050. In 2014, active mining operations and rehabilitation has stopped and the site remains in care and maintenance to this day.

[redacted]

[redacted]

5.2 Recent waterway quality

Table 5.1 shows a 'snapshot' of the current waterway quality at key monitoring sites for the main AMD indicator parameters over an approximately twelve-month period between 2024 and 2025 (where data was present). The location of the key monitoring sites are shown in Figure 3-14. Graphs showing pH, dissolved aluminium and turbidity overtime are provided in Appendix D.

Table 5.1 Median values from key mining related indicator parameters at waterways draining the Stockton Plateau over twelve months during period from 2024 and 2026 (for most sites)

Catchment	Waterway	Site ID – Current compliance sites in bold	Natural or recovered state	AMD indicator parameters. Median values. Sample numbers in brackets				
			Yes / No	Acidity70 (mg/L as $CaCO_3$)	pH	Dissolved Al (mg/L)	TSS (mg/L)	Turbidity (NTU)
Ngākawau	Ngākawau estuary	NRB	No	8 (3)	6.1 (28)	0.3 (25)	28 (9)	20 (28)
	Lower Ngākawau	**NR**	No	1.3 (46)	6.2 (247)	0.2 (236)	7 (255)	6 (255)
Mangatini	Manchester St Drain	MSD	No	228 (79)	3.2 (81)	34 (81)	20 (65)	17 (80)
	Mangatini Stream	**S14B**	No	-	4.9 (354)	-	38 (352)	14 (353)
		S14C	No	29 (232)	4.8 (245)	4.2 (233)	25 (246)	8 (246)
	Ford Creek	FC2	No	95 (36)	3.5 (42)	15 (34)	5 (4)	0.3 (8)
	Weka Creek	**S1**	Yes	9 (12)	4.4 (12)	0.4 (12)	3 (12)	1.1 (12)
Millerton	Mine Creek	MC1	No	544 (1)	2.9 (1)	70 (1)	6 (1)	16 (1)
		S6	No	69 (51)	3.3 (246)	6.1 (47)	3 (246)	2 (246)
		S23	No	1,616 (247)	2.6 (52)	170 (246)	3.2 (233)	0.8 (246)
	Miller Stream	**S24A**	No	1,040 (51)	2.7 (247)	120 (47)	3 (247)	1.3 (247)
	Granity Stream	GS5	No	704 (50)	2.8 (45)	82 (45)	3.3 (45)	2.9 (45)
		S25	No	70 (50)	3.3 (246)	8.3 (49)	5.2 (247)	7.6 (246)
	Granity Stream Trib	GT1	Yes	6 (8)	4.3 (8)	0.3 (8)	<3 (8)	0.8 (8)
	Hugh Stream	H1	Yes	-	7.1 (45)	-	1.3 (45)	0.4 (44)
	Rudolph Stream	R1	Yes	-	7.1 (1)	0.05 (1)	<1 (1)	0.3 (1)
		S28U	No	134 (50)	3.2 (51)	15 (49)	3 (50)	1 (51)
		S28U Trib	No	105 (45)	3.3 (46)	14 (44)	3 (14)	0.4 (46)

Catchment	Waterway	Site ID – Current compliance sites in bold	Natural or recovered state	AMD indicator parameters. Median values. Sample numbers in brackets				
			Yes / No	Acidity70 (mg/L as $CaCO_3$)	pH	Dissolved Al (mg/L)	TSS (mg/L)	Turbidity (NTU)
	Twins Stream	T1	No	61 (19)	3.7 (15)	7.1 (17)	4 (9)	9 (19)
		T2	No	63 (15)	3.7 (12)	9 (14)	8 (12)	14 (15)
		T3	No	15 (14)	4.6 (13)	1.8 (14)	8 (14)	9.8 (13)
		T22	Yes	10 (26)	4.2 (26)	0.25 (26)	<3 (16)	0.7 (26)
		T23	Yes	6 (13)	4.2 (13)	0.25 (13)	<3 (11)	1.0 (13)
	Un-Named Stream	T21	Yes	6 (14)	4.3 (13)	0.25 (14)	<3 (6)	0.6 (13)
St Patrick	Fly Creek	Fly5	No	6.5 (85)	4.7 (86)	0.5 (84)	3 (85)	1 (86)
	Plover Stream	PLAOFM	No	23 (48)	4.4 (48)	2.9 (48)	3 (47)	1.3 (47)
	St Patrick Stream	**S16**	No	32 (243)	3.8 (249)	4.1 (235)	3 (246)	1.4 (246)
		SP	Yes	3 (39)	5.7 (47)	0.07 (17)	3 (18)	0.7 (48)
	Un-Named Stream	**S3**	No	31 (2)	4.2 (11)	-	1.5 (11)	0.2 (11)
	T35 Stream	T35 Trib	Yes	-	4.4 (1)	0.32 (1)	-	-
Upper Waimangaroa	Herbert Stream	UC2	No	61 (11)	3.3 (12)	6.3 (12)	3 (11)	0.2 (12)
	Whirlwind Stream	**S4**	No	41 (11)	4.7 (12)	1.6 (3)	9 (12)	6.1 (12)
	Waimangaroa River	6W	No	TBC	TBC	TBC	TBC	TBC

5.2.1 Waterways with natural water quality

Within the main surface water catchments draining the Stockton Plateau there are smaller sub-catchments with waterways where the quality of the water is not influenced by Stockton mining activities (see Table 5.1). In these waterways, the quality of water is expected to occur in a natural state and reflect variations in the local soils and geology. Table 5.2 shows that natural quality waterways draining the BCM have a low median pH of 4.3 – 4.4 versus those draining the non-acid forming granite which show a median pH of 5.7.

Water originating from these higher quality non-AMD impacted waterways serve as an important resource, contributing to the dilution of contaminants in AMD impacted waterways and as Reference sites to assist the assessment of AMD impacts.

Table 5.2 Comparison of the waterways with natural water quality and those impacted by AMD

Stockton waterways draining to the coast and Ngākawau River	Median pH range	Median dissolved aluminium range (mg/L)	Median turbidity range (NTU)
AMD impacted	2.5 – 4.9	1 - 200	0.2 - 20
Natural water quality – BCM*	4.3 – 4.4	0.3 – 0.4	0.6 – 1.1
Natural water quality – Granite**	5.7	0.005 - 0.07	0.7

** Weka Creek S1, Granity Stream GT1, Twins Stream T21 and T35 Stream range of median values over approximately 12 months from 2024 – 2025*

*** St Patrick Stream SP median value over approximately 12 months from 2024 – 2025, and one-off sample from Rudolph Stream R1*

5.2.2 Waterway quality – 'with' and 'without treatment'

Table 5.3 shows the significance of the current water management practices on waterway quality. The comparison 'with' and 'without treatment', was undertaken using dissolved aluminium, a key parameter for assessing aquatic ecosystem health. The 'without treatment' estimates were compared at the following waterway monitoring sites:

- NR – 'without treatment' dissolved aluminium concentration scaled from sulfate concentration based on the correlation between NR dissolved aluminium and sulfate concentration in 2007 prior to AMD treatment.
- S14C and S16 – 'without treatment' dissolved aluminium concentration estimated from water quality datasets compiled for the 80-year water quality forecasts (Bathurst, 2026b).
- S4 – indicative 'without treatment' dissolved aluminium concentration estimated from median Whirlwind MSR influent water quality 2024-25 dataset (five samples).

Table 5.3 Dissolved aluminium concentrations in major AMD influenced Stockton waterways 'with' and 'without treatment'

Catchment	Waterway (Site ID)	Median dissolved aluminium concentration (mg/L)	
		Current (baseline) With treatment (Table 5.1)	Estimated current Without treatment (Appendix E)
Ngākawau	Ngākawau River (NR)	0.2	2.6
Mangatini	Mangatini Stream (S14C)	5	25
Millerton Block	-	Largely untreated at present	
St Patrick	St Patrick Stream (S16)	4.1	6.8
Upper Waimangaroa	Whirlwind Stream (S4)	1.6	13

Without treatment, the dissolved aluminium concentration in the lower Ngākawau River (NR) would rise by an order of magnitude to ~2.6 mg/L, resulting in a significant detrimental impact to aquatic ecosystems (see Table 5.4). Likewise, water quality would decline in the major waterways of all the other catchments, in particular, Mangatini and Whirlwind Streams. The exception is Millerton Block where waterways are largely untreated at present.

5.3 Nitrogen impacts on waterways

An assessment by Courtney Environmental (2025), summarised by Hickey (2026a) was conducted to evaluate potential nitrogen impacts on downstream waterways from Stockton Mine, focusing on the three key sources: ANFO explosives, treated sewage discharges, and fertiliser used in rehabilitation. The assessment is based on the last five years of ANFO consumption, wastewater treatment and fertiliser use for rehabilitation in the context of waterway nitrate-N and ammoniacal N concentration data (2021 – 2025). These rates of consumption are then compared to the planned future rates to understand if there is any change in consumption / application rates. Where changes are minimal, it would be expected that water quality performance, such as that over the years 2021 – 2025, would remain within the ranges recorded.

Explosives

The explosives assessment analysis shows that both overburden movement and nitrogen-based explosives (ANFO) use are expected to decrease over the renewal period compared to recent years, suggesting that nitrogen inputs will be similar to or lower than those previously observed. As a result, downstream nitrate-N and ammoniacal-N concentrations are expected to remain within the historical range.

Although blasting can leave nitrogen residues that may enter waterways, several site conditions help mitigate this risk, including high rainfall (which promotes dilution and flushing), geochemical processes such as pyrite oxidation (which can reduce nitrogen), and high water hardness. Additional risks arise from ANFO storage, transport, and handling, where spills or leaching can occur, particularly in wet conditions. However, existing management practices are designed to minimise these losses. Overall, the combination of stable or reduced nitrogen inputs and effective mitigation measures indicates a low likelihood of increased nitrogen impacts on downstream water quality from ANFO.

Sewage

Courtenay Environmental carried out an audit of the wastewater treatment systems at Stockton, with key observations being that the existing OWTS are all well over capacity apart from the Campbells Crib Hut, CHPP and potentially the Red Rocks Crib Hut systems. For the last three systems it is likely that the effluent will have concentrations expected of secondary treatment systems. In contrast, the other Stockton wastewater treatment systems are operating well below design capacity, which limits treatment performance due to insufficient carbon and nutrients that support effective biological processes. As a result, these systems are unlikely to achieve their intended effluent quality.

Based on the assessment it is likely that the total mass of nitrogen (and phosphorus) has decreased significantly compared to previous years. Hence the environmental impact of the discharges will be lower than previously even though the treatment systems are not performing to their design effluent quality.

It is expected that employee numbers at Stockton throughout the term of the renewal and until the end of active mining in FY2032 will be maintained at current levels followed by a reduction in employees using the Stockton wastewater systems after FY2032. Overall, total nitrogen and phosphorus discharges across the site have likely declined and are expected to reduce further after FY2032 as staffing decreases.

Fertiliser

Fertilisers are applied to rehabilitated areas to assist with plant growth. An application rate of 90 kg/ha of slow-release fertiliser is planned for use in the rehabilitation areas. The fertiliser has a 20% nitrogen content by weight. Runoff from areas that have had fertiliser applied, may contain elevate levels of nitrate-N and ammoniacal-N that can enter waterways. Since FY2022, BTM have rehabilitated areas totalling 112.4 ha, with scheduled rehabilitation at Stockton over the term of the renewal expected to near double those efforts. However, it is noted that from FY2032, no further ANFO usage will be occurring and therefore cumulative nitrogen discharges will reduce.

Effects summary

Predicted concentrations across the Stockton mining catchments show consistently low nitrate-N and ammoniacal-N concentrations well below ANZG and Drinking Water Standard thresholds, indicating that current management practices are likely to achieve compliance with regulatory standards. Overall, it is considered highly unlikely that ongoing ANFO consumption, handling, storage and wastewater irrigation levels will increase ammoniacal-N and nitrate-N levels in surrounding waterways as there will minimal changes to levels already in place.

Monitoring

While not currently measured in the majority of Stockton streams, nitrogen species are proposed to be added to the water quality monitoring suite as part of the BPCP (Instream, 2026). The proposed monitoring is summarised in Table 7.3.

Compliance limits were unable to be generated using the current short record of results; therefore, Bathurst propose the application of the current national bottom lines described in the National Policy Statement – Freshwater Management (NPS-FM) as a suitable interim compliance limit. NPS-FM nitrate and ammoniacal N thresholds are based on toxicity effects. The small dataset available shows that concentrations of ammoniacal N and nitrate are typically low in the Ngākawau River and currently meet the national bottom lines for nitrate and ammoniacal N based on the limited data available (Instream, 2026).

5.4 Aquatic ecosystem state and recovery thresholds

The current state of aquatic ecosystems in Stockton waterways varies widely. The non-AMD impacted waterways examples in Table 5.1 support diverse macroinvertebrate and fish communities (Section 2.7.1) whilst some AMD impacted waterways such Millerton are generally devoid of these but often contain a diverse range of algae and bryophytes that are well adapted to these conditions.

Instream (2026) provide a framework for classifying aquatic ecosystem state and thresholds for the recovery of Stockton waterways based on water quality, ecology and bioaccumulation indicators. Aluminium is the primary toxicity trace element of concern in BCM streams. The seven states are summarised in Table 5.4.

Table 5.4 Aquatic ecosystem state and recovery thresholds in Stockton waterways (adapted from: Instream, 2026)

Aquatic ecosystem state	Waterway quality classification threshold		State description
	Median pH	Dissolved aluminium 75th percentile (mg/L)	
Water quality impacted	< 4	> 2.8	AMD impacted. Minimal aquatic life and occasional macroinvertebrates.
Water quality Recovering	> 4	2.8 - 1	Some AMD impacts. Threshold where aquatic ecosystem recovery starts.
Water quality Recovered	> 4.5	< 1	Water quality inferred to be generally suitable for aquatic life. Macroinvertebrate recovery inferred to be approaching comparability to natural state. Potentially suitable for mahinga kai.
Ecology recovered	-	-	Aquatic communities demonstrably recovered. AMDI > 40 and EPT > 10 within the context of Reference sites.
Suitable for Mahinga kai	-	-	Bioaccumulation of contaminants within food safety guidelines and / or comparable to reference state.
Natural	-	-	Water quality not influenced by AMD. Where the natural waterway pH is <4.5, lower pH is permissible if not caused by AMD. Some indirect impacts on aquatic ecosystems still possible for natural quality waterways that are tributaries to AMD influenced waterways. Includes Reference sites and provides context for Impacted sites.
Unknown	-	-	Insufficient information to determine the state. Applies to some Millerton Block waterways.

The water quality thresholds in Table 5.4 (rows 1-3) provide a useful way to initially infer the aquatic ecosystem state without measuring fish and macroinvertebrates. The actual state requires field verification and depends on other water quality parameters, in particular other metals, toxicity modifying factors, stream habitat and water flow.

The current state of aquatic ecosystems at the main Stockton waterway monitoring sites is shown in Figure 5-2. These were developed based on the thresholds in Table 5.4, aquatic ecosystem monitoring and local knowledge of the waterways.

[redacted]

5.5 Ngākawau River

5.5.1 Upstream of St Patrick Stream confluence

The Ngakāwau River upstream of the St Patrick Stream confluence is not influenced by Stockton and aquatic ecosystems are present in their natural state (Instream, 2026).

5.5.2 St Patrick Stream confluence downstream to Mine Creek confluence

The key water quality monitoring site in this river reach is NR, ~200 m upstream of the Mine Creek confluence. In this reach, the water quality is influenced by:

– Treated AMD from Mangatini and St Patrick catchments
– Untreated AMD from historic Charming Creek Coal Mine & Old Fly Creek Mine outside Stockton
– Tidal influences

Water samples from the lower Ngākawau River at NR have been taken since 1998. Water management influences on pH are shown in Figure 5-3. From 2007 – 2010, pH increased from direct lime dosing to Mangatini Stream. From 2010 – 2014, the pH dropped after the UFL system was modified to dose upstream of Mangatini Sump and progressively increasing acidity loads exceeded the UFL dosing plant capacity. pH increased from 2014/15 after commissioning of the CaO dosing plant (LDP1) Appendix D.1.

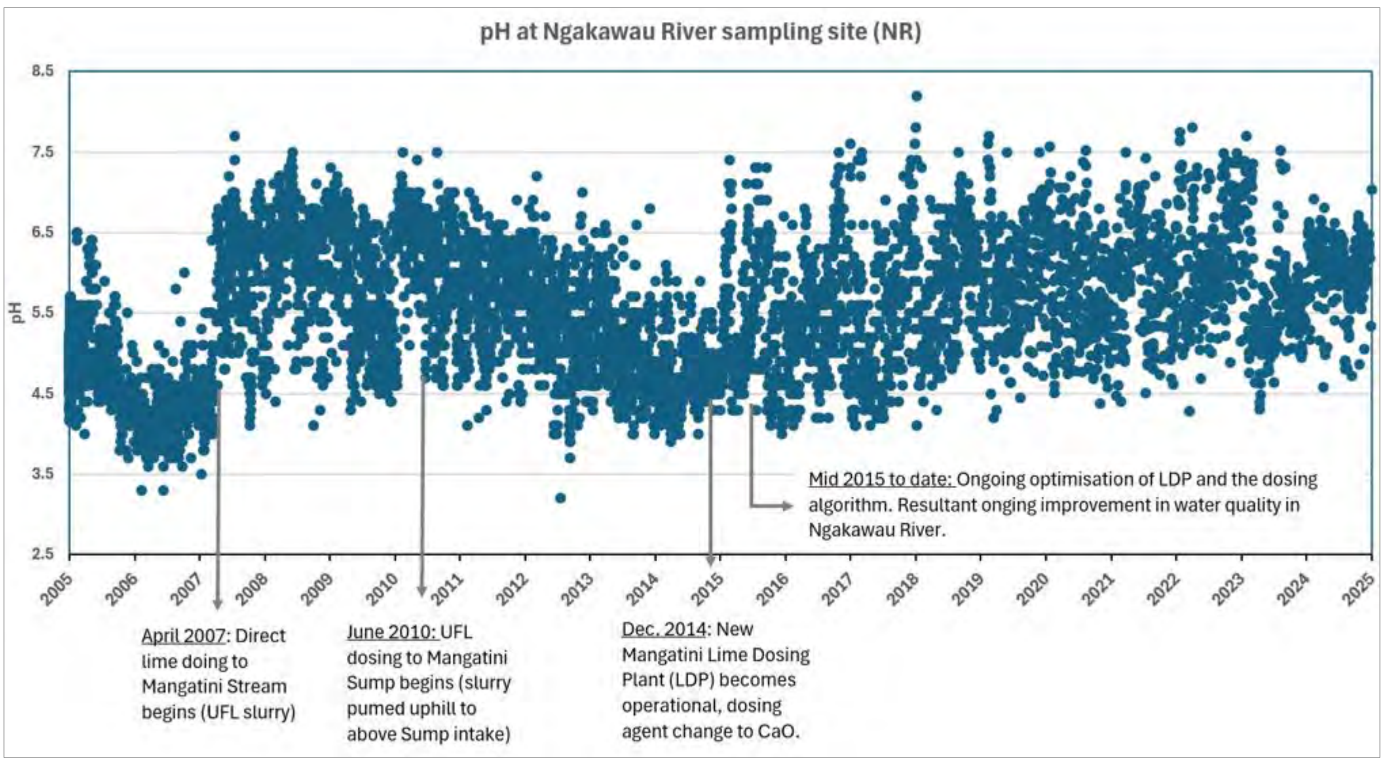


Figure 5-3 ***Changes in pH overtime at lower Ngākawau River monitoring site NR showing the influence of various water management approaches (source: Bathurst)***

Before remediation in the St Patrick and Mangatini Streams, turbidity at NR met the consent condition thresholds set to help restore the whitebait fishery (30-day rolling median < 25 NTU). However, when lime dosing began, turbidity increased because lime and complexed metals stayed suspended in the water. Turbidity stayed high until treated AMD was diverted into Mangatini Sump, where the particles could settle before being discharged into Mangatini

Stream. After that, except for a brief period in 2015, the 30-day rolling median remained well below 25 NTU (Instream consulting, 2025). The last twelve months (2024 – 2025) show a median pH and aluminium concentration of 6.2 and 0.2 mg/L, respectively (Table 5.1).

Aquatic ecosystems

Aquatic ecosystems in this reach of the river are inferred to be in a recovered state (Figure 5-2) as a result of the water management and subsequent water quality improvements in the Mangatini and St Patrick streams tributaries.

Fish surveys in the Upper Ngākawau river are reported to stakeholders and prove that migratory fish are returning due to the success of the existing AMD management/treatment approach and water quality improvements (Brown, 2025; Instream consulting, 2025).

[redacted] Fish surveys in the Ngākawau River taken in November 2024 are shown in Figure 5-4 and Figure 5-5.

The lower Ngākawau River is difficult to sample for macroinvertebrates due to its size (Instream, 2026). However, since ~2007, both pH and dissolved aluminium concentrations at NR have remained within the thresholds that allow for the presence of fish and macroinvertebrates (Instream, 2026). .

Figure 5-4 Fish survey on the upper Ngākawau River in November 2024 (source: PDP 2024)

[redacted]

5.5.2.1 Dissolved metals - Limit of Protection for aquatic ecosystems

Dissolved metals can be harmful to fish, macroinvertebrates and other aquatic species when the concentrations exceed certain values. The metal concentrations at which detrimental impacts occur is highly dependent upon toxicity modifying factors – the key ones being dissolved organic carbon, pH and hardness (as $CaCO_3$).

The impacts of dissolved metals on aquatic ecosystems incorporating toxicity modifying factors have been assessed by NIWA for the adjacent Denniston Plateau as part of the BPCP (Hogsden & Jellyman, 2026).

For moderately to highly disturbed aquatic ecosystems like those in the lower Ngākawau River between St Patrick Stream and Mine Creek confluence, the 80% Limit of Protection (LoP) for chronic impacts is considered suitable.

Instream (2026) provide a comparison of the ANZG (2018) 80% LoP (after adjustment for toxicity modifying factors) to the dissolved metal concentrations (aluminium, cadmium, cobalt, copper, iron, nickel, manganese and zinc) at NR since 2015. Their analysis showed that that aluminium exceeded the LoP the most (34% of the data) followed by copper (15% of the data) then zinc (8% of the data). Iron and manganese show no exceedances of the LoP, whilst the remaining metals (cadmium, cobalt and nickel) show exceedances of 6% or less.

The comparison shows that the occasional exceedance for some dissolved metals has the potential to impact on aquatic ecosystems.

5.5.3 Mine Creek confluence downstream to the coast

The key water quality monitoring site in the coastal reaches of the Ngākawau River is NRB, at the Ngākawau River mouth estuary which has been sampled since 2021. At this site, the median pH is 6.1 and dissolved aluminium is generally less than 1 mg/L with a median of 0.3 mg/L.

The river section downstream of Mine Creek has poorer water quality, than the upstream reaches. This is primarily due to AMD discharges from Mine Creek. At the river mouth monitoring site NRB, dissolved aluminium concentration spikes frequently exceed the upper limit for the occurrence of fish and macroinvertebrates (Instream, 2026) and monitoring shows impacts from Mine Creek AMD discharges. As a result, aquatic ecosystems in this section of the river are currently inferred to occur in recovering state. The influence of Mine Creek is hard to determine due to tidal flushing of the estuary. However, some influence on the Ngākawau River mouth can be observed in the case of recuring spikes in dissolved aluminium and iron (Instream, 2026).

Historic macroinvertebrate monitoring at the river mouth in 2001, prior to the water quality improvement in Mangatini Stream (through later treatment), indicated that the river was severely impacted by AMD, as indicated by a significant drop in the AMDI score (Gray et al 2012; Instrea, 2026). Surveys in 2009 found no evidence of inanga spawning, likely due to limited habitat and poor vegetation quality.

Additional macroinvertebrate and fish surveys were undertaken in early 2026 to evaluate the impacts of water quality enhancements. (Instream, 2026) [redacted] in the river mouth showing that the water quality is suitable for fish.

5.5.3.1 Low Density Sludge

Low Density Sludge (LDS) is discharged to the Mangatini Stream and ultimately the Ngākawau River (NR) and estuary. LDS discharge is infrequent and limited to periods when river flow is above 70th percentile (GHD, 2018). Therefore, ability to discern if effects are from other upstream influences or because of LDS discharge can be challenging.

Water quality monitoring results at site NR and NR Estuary indicate limited effects on pH from upstream influences (Instream, 2026). In contrast, both turbidity and dissolved aluminium are, on occasion worse at NR Estuary than at NR and more commonly exceed the ecological thresholds (Instream, 2026). LDS discharge has the potential to impact turbidity, and as such turbidity at the Mangatini Stream (site S14B) is currently managed through the lime dosing bypass consent (RC06206 V8) and Bathurst propose to roll over the conditions governing the activity therein (GHD, 2018) (Instream, 2026).

In terms of heavy metals from upstream influence, which includes the discharge of LDS, sediment tests from Ngākawau Estuary in 2026 show that in general sediments in the river mouth would not be considered to represent a risk of toxicity to aquatic biota other than for nickel (Instream, 2026). A proposed sediment quality sampling regime for the Ngākawau River to monitor effects of the low-density solids (LDS) is described in Instream's report (2026).

5.6 Mangatini catchment

Most of the upper Mangatini catchment is disturbed by historic mining which is the main source of AMD. However, mining is largely complete, and any additional mining and backfill activities are unlikely to increase acidity concentrations in waterways (Bathurst, 2026b).

5.6.1 Mangatini Stream

The key waterway monitoring sites are:

- MSD – Manchester Street Drain upstream of the Mangatini Sump inlet.
- S14C – Mangatini Stream 1 km downstream of the Mangatini Sump.
- S14B – Mangatini Stream 5 km downstream of Mangatini Sump.

MSD is an indicator of AMD impacts in this catchment prior to treatment from Mangatini Sump. At this monitoring site, the median pH (3.2) and dissolved aluminium concentration (34 mg/L) are well outside the range that would support aquatic life.

S14C characterises the water quality within the upper catchment influenced by mining and incorporates the influence of treatment of AMD pumped from adjacent Millerton Block and McCabes. Water quality improvements since 2005 have resulted in increased pH and reduction in acidity and dissolved aluminium concentrations Appendix D-2. The

AMD treatment efficiency through the LDP1 and Mangatini Sump treatment system equates to an ~90% removal of acidity between MGIU and S14C (Bathurst, 2026b). Over the period 2024 – 2025, S14C has a median pH of 4.8 and median dissolved aluminium concentration of 4.2 mg/L.

S14B is the most downstream monitoring site but located up stream of the confluence of major non-AMD impacted natural water tributaries, Repo Stream and Weka Creek. S14B has a similar pH to S14C.

Mangatini Stream aquatic ecosystems are currently in an impacted state (Figure 5-2). The stream contains very few macroinvertebrates, and no fish have been observed, though surveys have been limited. However, since the water quality improvements in 2005, pH and dissolved aluminium concentrations at S14C have begun to approach the thresholds that would support more a diverse macroinvertebrate community (Instream, 2026).

Downstream of the mining areas, the stream is fed by waterways in their natural state, resulting in improved water quality and more diverse aquatic ecosystems near the Ngākawau River confluence. The major natural state tributaries are Repo Stream, Sandy Creek and Weka Creek (Instream, 2026).

5.6.2 Ford Creek

Ford Creek is the most upgradient tributary of Mangatini Stream. Monitoring site FC2 shows AMD impacts with a current (2024 – 2025) median pH of 3.5, and median dissolved aluminium concentrations of ~15 mg/L. The water quality at FC2 has improved between the pre 2013 and post 2023 periods Appendix D-2. This is due to the diversion of Ford Creek #4 Dam spills to Mangatini Sump at the end of 2012, in addition to improvements from rehabilitation and acidity decay.

5.6.3 Natural water quality

The Mangatini catchment contains several waterways down-gradient of the mining areas that have no AMD impacted water quality. The mains ones are tributaries of the lower Mangatini Stream and include MT6, MT7, Repo Stream, and Weka Creek which flows into Sandy Creek.

Weka Creek monitoring site S1 shows water quality improvement from pre 2017 conditions through to current day with a relatively high median pH of 4.4, low acidity and low dissolved aluminium concentration (0.4 mg/L) compared to the AMD impacted Mangatini waterway monitoring sites Appendix D-2.

5.7 Millerton Block

The Millerton Block is the most AMD impacted area at Stockton. Characterised by highly fractured, pyrite (iron-sulphide) bearing AMD producing sandstone BCM that overly an extensive network of historic underground workings with remnant (accidentally started) fires in several areas that have been burning since 1904 from historic mining. The AMD is sourced from active working areas (including opencast mining), ELFS (under construction), historic underground workings, the underground fires and the water used for fire suppression. Figure 5-6 shows the main AMD producing areas (as of 2025) and original extent of the underground workings.

[redacted]

Fire suppression is required to cool or extinguish underground fires to enable access for mining. However, the water leaches acidic salts from historic underground workings and increases acid mass to downstream waterways, in particular Mine Creek, Miller Stream and parts of Granity Stream. Once operational fire suppression ceases (around 2028), more AMD impacted water will be captured for treatment (as opposed to being used for fire suppression) resulting in improvements to pH, acidity and metals in some waterways.

Ultimately, putting out these fires in addition to other water management approaches including opencast mining (Figure 5-7) which removes the underground workings that are a source of fuel for the fires will assist the long-term water quality which is expected to be an improvement from the current operating conditions.

Bathurst has put out approximately eight historic underground fires through progressive opencast mining of the Millerton Block over the past ten years through pumping of water into the ground. Bathurst proposes to extinguish three more over the next three years. There will likely be one fire at Loop Road remaining (Bathurst, 2026b) when mining ceases which is likely to continue contributing AMD to waterways.

Figure 5-7 Millerton North opencast mining September 2024 (source: GHD)

5.7.1 AMD impacted waterways

Aquatic ecosystems in Mine Creek, Miller Stream and Granity Stream largely exist in an impacted state Figure 5-2 and the AMD contamination is such that they are devoid of fish, have very few macroinvertebrates, and low ecological value.

Mine Creek is a major source of AMD to the Ngākawau River. The three key water quality monitoring sites and their level of AMD impact are (Bathurst, 2025d):

– Heavily impacted upper Mine Creek south tributary (S23). Water quality has declined since 2022.
– Moderately impacted upper Mine Creek north tributary (S6). Generally stable long-term water quality.
– Moderate to heavily impacted Mine Creek main channel at the Ngākawau River confluence (MC1), which includes the influence of both S23 and S6 tributaries.

Granity Stream discharges directly to the ocean. The key waterway monitoring site is S25 at Millerton Township and GB1 at the state-highway bridge. The water quality at S25 has been relatively stable from 1990 – 2024. Since 2024 there has been a rise in acidity and corresponding rise in the median dissolved aluminium concentration to 8.3 mg/L due to increased mining and fire suppression activities Appendix D-3. At GB1, the water is highly acidic, having pH values persistently below 4 and elevated dissolved aluminium concentrations (Instream, 2026).

Miller Stream is a tributary of Granity Stream. The key monitoring site, S24A at Millerton Township shows a general decrease in pH from 2010 to 2023. Despite the overall poor water quality due to historic underground workings and fire suppression, the site shows a slight improvement (increasing pH) and stable or decreasing dissolved aluminium concentration from 2023 – mid 2025 Appendix D-3.

Twins Stream is located south of Granity Stream and discharges directly to the ocean. On the main Twins Stream stem, monitoring site T1 near the Plateau is slightly affected by historic underground mining from Stockton with a pH of 4.2 and dissolved aluminium concentration of 3.2 mg/L Table 5.1. However, the water quality in tributary monitoring sites T21, T22 and T23, also in the upper catchment show minimal mining impacts with a median dissolved aluminium concentration less than 0.3 mg/L Table 5.1.

Rudolph (sometimes referred to as Rudolf) Stream is located south of Twins Steam and discharges directly to the ocean. The waterway does not receive contemporary AMD from Stockton as runoff from contemporary workings are diverted by a cut-off drain. However, the waterway is subject to AMD discharges from historic underground workings outside the Stockton CML within the area of Rockies Coal Mine (Section 5.1.3). At the upstream site S28U, the median pH was 3.2 during 2024/25 and median dissolved aluminium over the same period was 15 mg/L.

5.7.2 Natural water quality

Not all waterways in the Millerton Block are impacted by AMD. The lower reach of Twins Stream (recovering state), lower reach of Rudolph stream (recovered state), and several small waterways that discharge into Mine Creek or directly to the coast which are not impacted by AMD or have very minimal impact (Figure 5-2).

Monitoring site GT1 on Granity Stream Tributary is not impacted by AMD. The monitoring site is located at the head of the tributary and south of the main Granity Stream channel. The median dissolved aluminium concentration is 0.3 mg/L.

At Twins Stream, the water quality at the downstream site T3 is slightly better than at T1 due to dilution with non-AMD impacted water and has a pH of 4.8 and dissolved aluminium concentration of 2.2 mg/L which is very close to the threshold for supporting aquatic ecosystems systems.

The water quality measured at lower Rudolph Stream monitoring site R1 downstream of Rockies Coal Mine near the state-highway has circum-neutral pH and low dissolved aluminium (0.04 mg/L in 2025) and is much better than at monitoring sites S28 and S28U upstream of Rockies Coal Mine within the Stockton CML.

5.8 St Patrick catchment

Mining disturbances within the St Patrick Catchment are found in three main areas: 1) at Mt Fred, affecting the upper tributaries of Fly Creek and Plover Stream, 2) the McCabes area west of the LDP2 dosing point and McCabes Sump, and 3) the northern section of the Cypress Project in the headwaters of St Patrick Stream. However, like the Mangatini catchment, most mining activities in the St Patrick Catchment—including those in Fly Creek, Plover, and McCabes have now largely concluded (Bathurst, 2026b). Combined with new water management measures implemented by Bathurst and previous Solid Energy, these changes have brought about improvement in the waterways of the St Patrick Catchment, particularly in Plover Stream, Fly Creek, and St Patrick Stream. The main site for assessing AMD impacts in this catchment is St Patrick Stream monitoring site S16.

5.8.1 St Patrick Stream

St Patrick Stream is a major tributary of the Ngākawau River and receives AMD impacted water from areas with historic and ongoing mining, including the Cypress Mine. Additional AMD comes from other small headwater catchments of Whirlwind and Herbert Streams which have been permanently diverted to St Patrick Stream during recent mining operations to improve AMD management.

The stream receives most of its flow from Fly and Plover creeks and has been subject to long-term monitoring (since 1987) at site S16 located downstream of McCabes Sump. St Patrick Stream monitoring site S16 shows reduced dissolved aluminium concentrations and higher pH since 2018 and commissioning of McCabes sump in 2023 has resulted a marked improvement at S16 due to the capture of historic flows from Fly Creek and increased efficiency of Cypress mine water treatment system.

Aquatic ecosystems on St Patrick Stream main channel are currently in an impacted state (Figure 5-2) but improving with time. Since monitoring commenced in the early 2000's, the main channel water quality at monitoring site S16 has consistently been unsuitable for fish and most macroinvertebrates. Nonetheless, macroinvertebrate samples collected in 2008 and 2025 did find taxa. In 2008, two taxa were present and in 2025 there were seven taxa suggesting some improvement overtime (Instream, 2026).

5.8.2 Fly Creek

Fly Creek (tributary of St Patrick Stream) at the Fly5 monitoring site was impacted by historic underground workings and runoff from overburden areas which discharge directly into Fly Creek without AMD correction up to 2023. To remedy this situation, a concrete weir was constructed in Fly Creek with a gravity pipeline installed through the weir into the upstream captured water. This pipeline was designed to take up to the 70th percentile flow from Fly Creek and direct it to McCabes Lower Sump for AMD correction. This resulted in a significant water quality improvement (increased pH and decreased acidity and dissolved aluminium concentrations) at the Fly5 monitoring site from 2023 as shown in Appendix D-4, with a median dissolved aluminium concentration of 0.5 mg/L from 2024 – 2025 (Table 5.1).

5.8.3 Plover Stream

Plover Stream (tributary of St Patrick Stream) has a water quality roughly between Fly Creek (Fly5) and St Patrick Stream (S16). Plover Stream shows improved water quality (higher pH and lower dissolved aluminium concentrations) from 2020 Appendix D-4 due to completion of mining in the NO.2 South Mining block. However, Plover Stream continues to receive untreated AMD from mining affected areas.

5.8.4 Natural water quality

St Patrick Stream Tributary at site SP is a not impacted by AMD. The monitoring site is located adjacent to Cypress mining area at the head of the tributary with a current median pH of 5.7 and median dissolved aluminium concentration of 0.07 mg/L.

Aquatic ecosystems in the St Patrick Stream tributary T31 Stream are currently in an impacted state ([redacted] pers. Comm. 2025) (Figure 5-2). The stream has two water quality records from 2007. Dissolved aluminium was 1.7 and 1.4 mg/L while pH was 3.4 and 3.3. Macroinvertebrates species richness is low, and AMDI scores suggest severe AMD impact. However, T35 Stream tributary has much better water quality and is currently considered to be recovered (Instream, 2026). Monitoring in 2007 showed a dissolved aluminium concentration of 0.32 mg/L, pH of 4.4, and many more macroinvertebrates compared with T31 Stream (Instream, 2026). The T35 Stream tributary is planned to be monitored as a future reference site.

5.9 Upper Waimangaroa catchment

5.9.1 Herbert and Whirlwind Streams

Herbert and Whirlwind streams drain the ridge between Mounts Frederick and Augustus and discharge directly into the Waimangaroa River. The upper reaches of these streams are diverted from the Waimangaroa River and into Plover and St Patrick streams for treatment. The lower reaches receive historic AMD discharges. Seepage into Whirlwind Stream is treated using a MSR passive treatment system. Both streams are monitored in their headwaters, Whirlwind Stream at S4 (downstream of the MSR) and Herbert Stream at Site UC2 (Instream, 2026).

Whirlwind Stream

Aquatic ecosystems in the Whirlwind Stream are currently in a recovering state (Figure 5-2). Since March 2025 when the MSR was replenished with mussel shells, the Whirlwind Stream monitoring site S4 downstream of the MSR has had a median pH of 4.9 that would support aquatic life and dissolved aluminium concentration during base flow of <1 mg/L. Several published papers (DiLoreto et al, 2016; Weber et al, 2015) detail the success of the Whirlwind MSR since it became operational in treating the AMD seepage into Whirlwind stream.

During high rainfall events, a recently flooded lake in the SN14 pit upstream of the MSR and monitoring site S4 has developed a seepage that bypasses the MSR and leads to higher dissolved aluminium and concentrations >1 mg/l. However, in the future, the seepage is expected to be no longer present as the flooded SN14 pit will be pumped out and treated, and the pit itself filled with overburden before EOML.

Macroinvertebrate sampling undertaken in 2007, before commissioning the MSR in 2012 showed that Whirlwind Stream was severely to moderately impacted by AMD (Instream, 2026).

Herbert Stream

Herbert stream is in an impacted state and consistently water quality at site UC4 has dissolved aluminium >2.8 mg/l and pH < 4. Monitoring Site UC2 shows relatively consistent pH and dissolved aluminium concentration from 2011 to current with a slight improvement over 2025 (Instream, 2026).

5.9.2 Upper Waimangaroa River

Upper Waimangaroa River headwater monitoring site 6W receives AMD from the current Stockton opencast mining operations, and historic workings discharging to the Herbert and Whirlwind streams. The site is currently monitored as part of the Cypress Mine consents (Instream, 2026). At this site, the dissolved aluminium ranges from 1 – 4.4 mg/L, while pH ranges from 4.4 – 4.7. There are no trends (Instream, 2026), however, water quality at the site is improved by the Whirlwind MSR passive treatment system.

Aquatic ecosystems in the Upper Waimangaroa River adjacent to Stockton and Cypress mining areas are in a recovering state (Figure 5-2).

5.10 Water users

5.10.1 Surface water

Surface water take, use, dam and diversion consents occur on some Stockton waterways. They exist for a range of purposes that include mining, hydropower, and two takes downgradient of Millerton and Rockies areas for community and domestic supplies.

[redacted]

[redacted]

[redacted] Since Bathurst do not take, dam or divert water from these waterways, there is considered to be no impact at present.

[redacted]

5.10.2 Groundwater

5.10.2.1 Groundwater consents

Third party groundwater consents are held by:

– [redacted]

Currently none of these consents are being exercised.

[redacted]

5.10.2.2 Registered bores

[redacted]

5.10.3 Human health - Mahinga Kai

Marine mussel sampling undertaken in 2006/7 and 2025 was used to assess the potential effects on the coastal and marine environment downgradient the Granity Stream and Ngākawau River discharges. Cadmium, lead and mercury were found to be below food safety limits, and although total arsenic exceeded food safety standards, the likely inorganic arsenic fraction indicates concentrations were still within acceptable food safety thresholds (Instream, 2026). Most metals met health-based guidance values, while exceedances of iron, magnesium and selenium were not considered clearly attributable to mining because of the nature of the guidance values, natural occurrence in food, and elevated selenium at both reference and discharge-influenced sites. Overall, metal concentrations were comparable with other New Zealand mussel studies and showed no substantive differences between sites or over time, and were typically below food safety standards (Instream, 2026).

6. Future impacts

6.1 Future impacts from other mining areas

6.1.1 BPCP Sub Areas

6.1.1.1 Cypress

The Cypress BPCP sub-area has an existing consented baseline of activities, discharges and controls. AMD impacted water from Cypress is directed to the McCabes sump for treatment and discharged to St Patrick Stream at Stockton, and as such, these impacts are addressed within this review.

Significant ongoing mining activities at Cypress are scheduled to EOML in 2033 with an increase in acidity loads from Cypress anticipated from 2027 - 2033. However, effective operation of capture sumps and pump / pipelines at Cypress has resulted in a significant reduction in acidity loads reporting to St Patrick Reservoir as key AMD sources such as the Cypress Pit and Northern ELF are diverted to LDP2 / McCabes Sump. As such, Cypress mining is not expected to increase acidity at St Patrick Stream monitoring site (S16) over its mine life because (Bathurst, 2026b):

– Effects of residual St Patrick Dam decant drain acidity loads are already included in current S16 water quality monitoring data.
– AMD pumped from Cypress to McCabes is treated so Cypress acidity loads do not contribute to an increase in residual acidity concentrations discharging McCabes Sump.

Post closure acidity concentrations from Cypress reporting to St Patrick Stream (S16) are also expected to be negligible due to a combination of (Bathurst, 2026b):

– Removal of ex-pit PAF landforms.
– Final landform design to minimise AMD generation, with PAF waste rock storage in either saturated conditions or under relatively low slope compacted surfaces.
– Passive management or treatment at Cypress of any residual AMD (if required) to meet upper St Patrick Stream monitoring site 8W compliance criteria of <14.6 mg/L acidity and <1 mg/L dissolved aluminium.

In addition, excess waste rock material from Cypress will be disposed to land at Stockton.

6.1.1.2 Upper Waimangaroa Haul Road

The proposed UWHR intersects three catchments, from the south Ngākawau, through the eastern (upper) Waimangaroa and into the upper Whareatea (MWM, 2026). A portion of the UWHR passes through the rehabilitated Cypress mining area beyond Cypress closure in ~2033. This will result in discharges to waterways in the St Patrick and Upper Waimangaroa catchments from permanent sediment retention ponds associated with the UWHR. In addition, UWHR excess waste rock material will be disposed to land at Stockton up until ~2042.

6.1.1.3 Escarpment Extended and Mount Frederick South

Coal and rejects from the ESE and MFS BPCP sub-areas will be processed at Stockton, with coarse rejects sent to Stockton ELF and fine rejects to the Stockton A Drive CFS area. These materials, consisting of both PAF and NAF, will be managed through appropriate treatment and land rehabilitation, with all transfers ceasing in ~2042.

6.1.2 Charming Creek Coal Mine

Unmanaged AMD discharges from the historic Charming Creek Coal Mine into the lower Ngākawau River is expected to continue but will decline over time from acidity decay for decades (Section 5.1.2). The effect of this discharge could limit the degree to which future water quality in the lower Ngākawau River will improve under the BPCP.

6.1.3 Rockies Coal Mine

The Rockies Coal Mine near Twins Stream, south of Granity, was mined historically using underground and opencast methods (Section 5.1.3). The mine is currently in care and maintenance, and there has been limited public information about its future. If the mine does not re-commence, the influence on Twins Stream and Rudolph Stream water quality is expected to remain similar to the current state (Section 5.1.3). Should the mining operations be re-commenced, changes in water quality would be expected.

Should mining re-commence, the Rockies Coal Mine operations would include land rehabilitation, water treatment and mining out of historical underground workings (REM, 2010). This would be expected to reduce the long-term AMD impacts on Twins and Granity streams over time. Bathurst is proposing a Compliance site located at T1 (upstream of the neighbouring Rockies Coal Mine influence) for managing the impacts of the BPCP on Twins Stream and to differentiate the effects from Stockton and Rockies Coal Mine operations.

6.2 Future impacts with the BPCP

6.2.1 Waterway flows

A full description of the BPCP influence on Stockton water flows is provided in MWM (2026) and a summary is provided below.

6.2.1.1 Mangatini, St Patrick and Upper Waimangaroa catchment

The Mangatini catchment consists of predominantly rehabilitated mining areas, with run-off from disturbed and rehabilitated areas discharging to the Mangatini Sump for treatment and settlement. The capture of disturbed footprint runoff in sumps, and pumping to the Mangatini Sump, is estimated to cause a change to stream flows.

St Patrick dam discharges to St Patrick Stream and provides sediment capture for the Cypress haul road run-off. Water for dust suppression use on haul roads is taken from A-Drive Sump or St Patrick’s Dam. The historic Fly Creek underground mine sits in the northern area of the St Patrick catchment and contributes AMD to St Patrick Stream.

Under the BPCP, water management within the Upper Waimangaroa catchment is dominated by the capture, diversion, and controlled discharge of runoff from disturbed and rehabilitating mine areas, rather than discharge via unmodified natural drainage. Surface water generated from BPCP activities associated with the Upper Waimangaroa Haul Road and adjacent mining areas is intercepted by engineered infrastructure (including drains, culverts, sumps, and treatment systems), modifying natural flow pathways and timing to reach downstream waterways. Existing and proposed water management structures will be retained and maintained until rehabilitation is complete, meaning headwater flows within the Upper Waimangaroa catchment will continue to be influenced by flow attenuation and controlled release, particularly during high rainfall events.

6.2.1.2 Millerton Block

Table 6.1 presents a summary of forecast changes to waterway flow rates within the Millerton Block, comparing flow conditions from pre-opencast mining, post-opencast mining, and future operational phases including sump pumping and EOML. The table provides both 90th percentile and median flow rates, offering insight into how mining activities and rehabilitation practices are expected to influence water movement throughout the area.

The forecast future operation phase (2027 - 2033) will result in a reduction to the flow in Granity Stream, Miller Stream, and the Mine Creek north tributary due to capture of disturbed footprint runoff in sumps and pumping to Mangatini Sump. There is expected to be no additional flow change at Mine Creek southern tributary because the Millerton disturbance does not extend into this sub-catchment and similar flow volumes are assumed to report to the syncline / adit over the remaining LOM.

Long-term continuous flow monitoring data are not available for Twins Stream (T1). As such, flow change estimates due to pumping AMD collected water in Twins Sump to other catchments was not possible. An indicative assessment of percentage changes to flow rates at key sites along Twins Stream sites T1, T2 and T3 showed a percentage flow drop in the range of 25% - 67% (Bathurst, 2025d).

Through the EOML phase, the flow in Granity Stream, Miller Stream, and the Mine Creek south tributary will generally reduce in comparison to the pre and post-opencast, noting an exception at Granity Stream where forecast EOML exceeds the Post-Opencast. Waterway flow estimates for Mine Creek Northern Tributary (S6) are the same as the operational phase, where MW16 Sump AMD continues to be pumped to Mangatini for treatment. Flow changes in Twins Streams during the EOML phase are expected to be minor (ranging from 1.2% - 4%) due to the small changes in catchment area (Bathurst, 2025d). The largest change in flow is at Mine Creek (S23). This is due to a significant amount of underground workings (highly impacted by AMD) reporting to S23 that are removed, captured and treated.

Table 6.1 Summary of Millerton Block waterway flow changes. Changes from post-opencast in red (lower), same (green), higher, (blue)

Waterway	90th percentile flow rate (L/s)				Median flow rate (L/s)			
	Pre-opencast	Post-opencast	Forecast operation phase with sump pumping	Forecast EOML phase	Pre-opencast	Post-opencast	Forecast operation phase with sump pumping	Forecast EOML phase
	Pre 2010	2011 - 25	2027 - 33	2033 - 46	Pre 2010	2011 - 25	2027 - 33	2033 - 46
Granity Stream (S25)	439	225	136	423	40	39	24	39
Miller Stream (S24A)	419	466	322	312	171	178	123	127
Mine Creek (S23)	545	464	464	68	85	151	151	27
Mine Creek (S6)	-	473	316	316	-	78	52	52

6.2.2 Aquatic ecosystems

A key environmental concern associated with the continued operation, closure and long-term rehabilitation of Stockton is the potential impact of AMD on waterway quality and aquatic ecosystems.

Current strategies demonstrate that AMD impacts on aquatic ecosystems can be reduced through continuous water management and remediation and resultant improvements in waterway quality towards a recovering state for aquatic ecology.

Stockton waterways are expected to show a change from the 'Current' aquatic ecosystem state over the period of the BPCP (2027 – 2062) and in 80-years (to 2106) with the BPCP are summarised in Table 6.2 and shown in Figure 6-1 (sourced from Instream, 2026).

Table 6.2 Stockton waterways expected to show a change in aquatic ecosystem state between by 2062 and 2106 (80-years) (sourced from Instream, 2026, Bathurst 2026a, Bathurst, 2026b)

Catchment	Waterway sections	Stockton waterways expected future changes in aquatic ecosystem state with the BPCP		
		'Current' state	Future state by 2062 (35 years)	Future state by 2106 (80 years)
Ngākawau	Lower Ngākawau River between Mine Creek confluence at MC1 and the river mouth at NRB River	Recovering	Recovered	Recovered
Millerton Block	Twins Stream lower reach from T3 to the coast	Recovering	Not modelled*	Recovered
Mangatini	Lower Mangatini Stream, downstream of S14B to the Ngākawau River confluence	Impacted	Recovering	Recovered
	Upper Mangatini Stream, upstream of S14B	Impacted	Recovering	Recovering
St Patrick	Upper St Patrick Stream between the S16 monitoring site and T35 Stream confluence	Impacted	Recovering	Recovering
	Middle and lower St Patrick Stream below the T35 Stream confluence	Impacted	Recovering	Recovered
Upper Waimangaroa	Whirlwind Stream	Recovering	Not modelled**	Recovered

Notes:

*Not modelled, however, given the removal of contaminated water from the catchment during the operational period, despite reductions in flow of ~ 25% at T3, improved water quality is expected to accelerate the onset of ecological recovery faster than in the absence of treatment (Instream, 2026).

**Not modelled, in future state 2106 it is assumed to no longer receive AMD discharge due to treatment but sits outside the BPCP.

The detailed description of the waterway quality and assessment of impacts on aquatic ecosystems is provided in Instream (2026).

6.2.3 Natural water quality waterways

There are several waterways with water quality that is not impacted by mining. These waterways are shown in blue Figure 6-1 and will remain unimpacted by the BPCP. A key objective for these waterways is that they be protected from any potential future impacts (Instream, 2026).

[redacted]

[redacted]

6.2.4 Ngākawau River

6.2.4.1 Upstream of St Patrick Stream confluence

Upstream of the St Patrick Stream confluence there are no AMD discharges and the Ngākawau River is essentially pristine. However, AMD has historically created a chemical barrier to fish migration through the lower reaches, with resultant impacts to fish communities in the upper reaches. Ongoing treatment and reductions in contaminant load to the lower Ngākawau River associated with the treatment initiatives proposed under the BPCP will enable improved fish migration and over time allow the colonisation of more sensitive taxa in the upper reaches (Instream, 2026).

6.2.4.2 St Patrick Stream confluence downstream to Mine Creek confluence

Despite the potential for treatment of Millerton AMD to cause an increase above the current dissolved aluminium concentrations, lower Ngākawau River site NR is forecast to always stay within the 1 mg/L threshold (for the annual 75th percentile) for fish and macroinvertebrates (Instream, 2026).

The lower Ngākawau River site NR (upstream of Mine Creek) is key for understanding AMD impacts on the migration of fish into the upper Ngākawau River headwaters caused by AMD discharges from the Mangatini and St Patrick catchments. The AMD load and dissolved aluminium concentrations at NR may increase during the operational phase as AMD is pumped from the Millerton Block and into the Mangatini catchment for treatment. This could be caused by increased treatment residuals from a significant increase in acidity load treated at Mangatini Sump. These effects are shown in Figure 6-2 by the grey and yellow 'managed effect' lines that exceed the 'potential effect'. The 'potential effect' assumes that Millerton AMD discharges into Millerton waterways has no effect at NR.

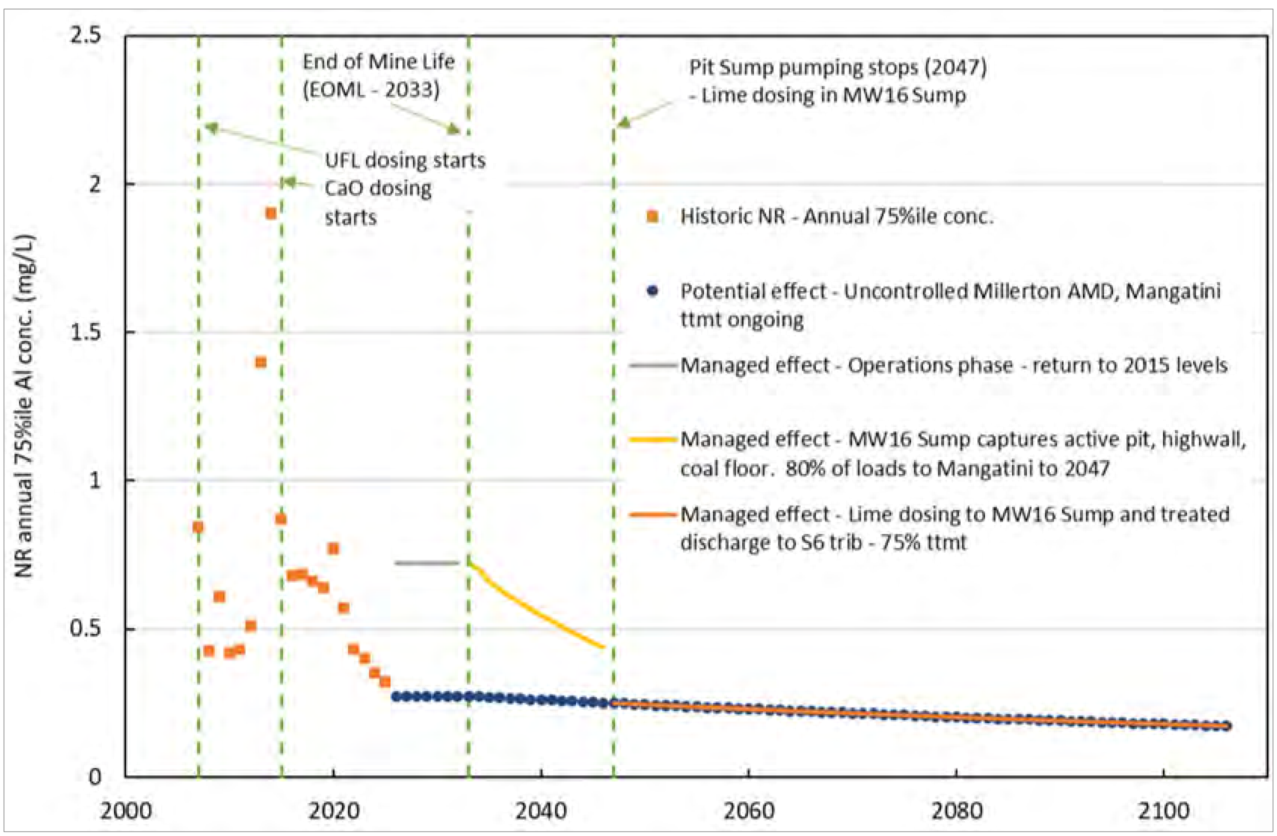


Figure 6-2 75th percentile dissolved aluminium concentrations at lower Ngākawau River site NR over the next 80 years (source: Bathurst, 2025)

Figure 6-2 shows that the acidity load will diminish at the EOML due to rehabilitation on Millerton ELF, with a further drop occurring when the Millerton Block AMD is treated in MW16 Sump from 2047 onwards.

6.2.4.3 Mine Creek confluence downstream to the coast

The Ngākawau River at the State Highway bridge (Site NRB) ~150 m upstream of the Ocean is impacted by AMD from several sources, including St Patrick Stream, Mangatini Stream, Mine Creek, and historic non-Stockton sources like Charming Creek. Upstream of the Mine Creek confluence (e.g., at site NR), water quality generally meets aquatic ecosystem thresholds, but downstream sites (e.g., NR Estuary) occasionally exceed these limits, especially during base flows due to Mine Creek AMD discharge. [redacted]

AMD management, particularly targeting Mine Creek, is expected to reduce contaminant loads and risks to migratory fish, with modelling indicating that ecological recovery criteria (annual 75th percentile dissolved aluminium < 1 mg/L) will be met at the hypothetical 'NRB River' site by around 2034 (Figure 6-3). Improvements upstream will further support the recovery of aquatic ecosystems both in the river and reduce the risk of effects in the coastal marine area (Instream, 2026).

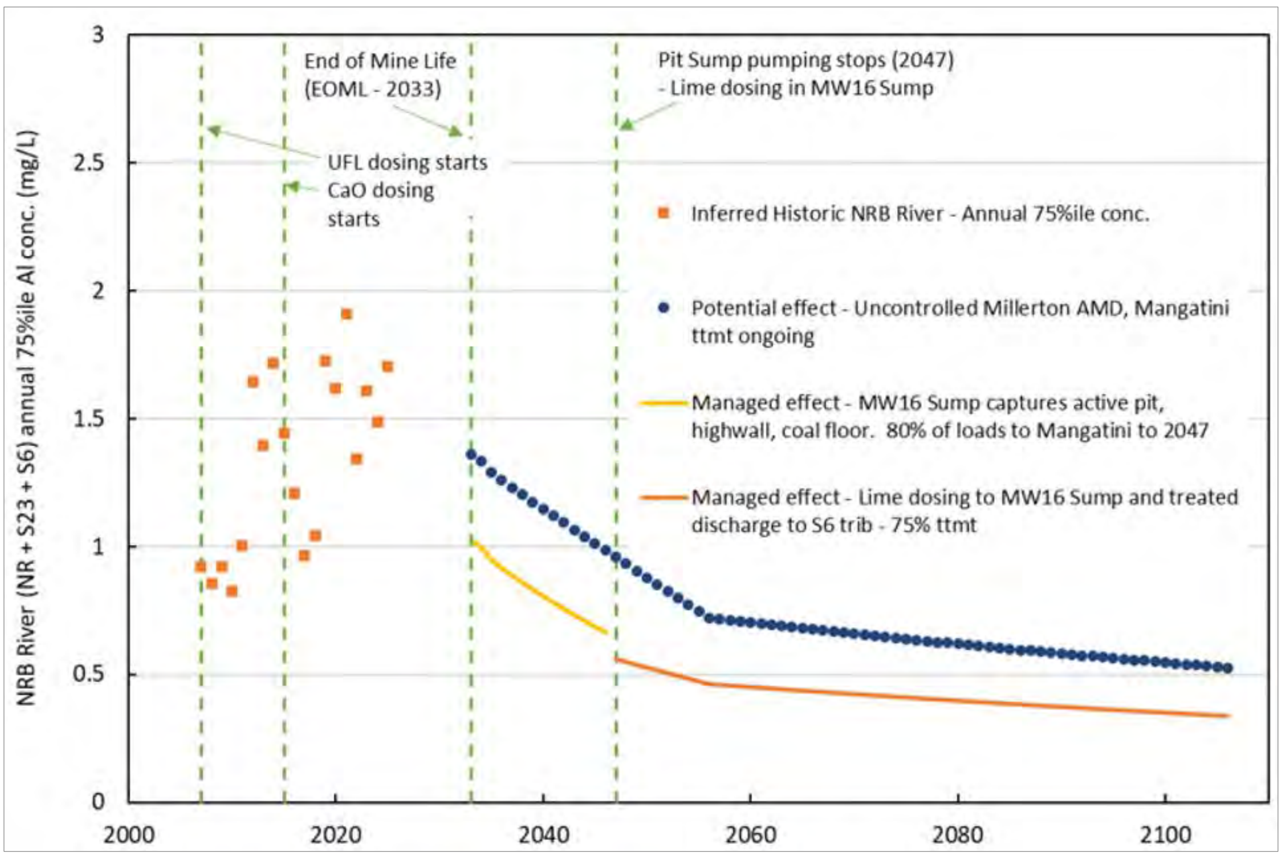


Figure 6-3 75th percentile dissolved aluminium concentration at a hypothetical site 'NRB River' located downstream of the Mine Creek, Ngākawau River confluence over the next 80 years (source: Bathurst, 2025)

Currently, dissolved aluminium poses a potential risk to fish migration at Site 'NRB River'. Water quality monitoring data for the existing monitoring site in the Lower Ngākawau River (Site NR Estuary) showed the dissolved aluminium concentration exceeding 1 mg/L in 30% of sampling occasions, although recent fish surveys show no obvious impact on fish migration (Instream, 2026). [redacted]

[redacted] Overall, ongoing AMD management and water treatment, in combination with careful monitoring and seasonal mitigation, are expected to support the long-term recovery and maintenance of healthy aquatic ecosystems in the Ngākawau River (Instream, 2026).

6.2.5 Mangatini catchment

6.2.5.1 Mangatini Stream

The long-term forecast of Mangatini Stream (MGUI) and Mangatini Stream (S14C) acidity and dissolved aluminium concentrations are shown in Appendix E-2-1 and E-2-2 respectively.

While substantial remediation has occurred to date in Mangatini Stream and overall catchment, further improvements are envisaged as rehabilitation and mine closure continues. Figure 6-4 shows that the estimated future dissolved aluminium concentrations in Mangatini Stream site S14C will reach the aquatic ecosystem 'recovering' state (annual 75th percentile dissolved aluminium < 2.8 mg/L) by 2047. The step reduction in dissolved aluminium in 2047 is due to commencement of the Millerton AMD treatment in MW16 Sump, and a proportional reduction in acidity loads reporting to Mangatini for treatment.

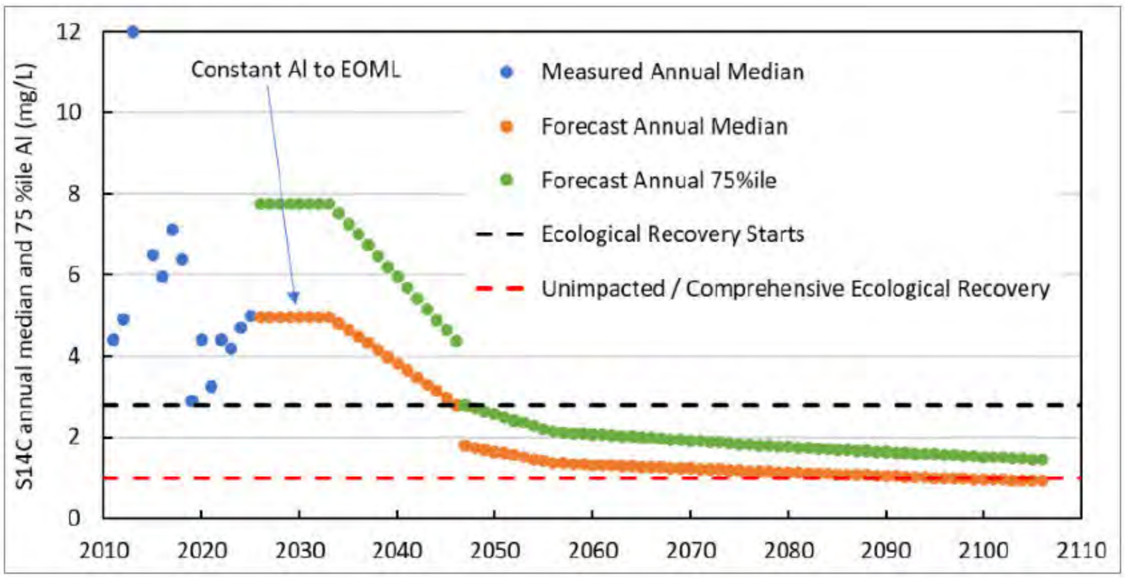


Figure 6-4 ***Mangatini Stream site S14C measured annual median and the forecast long term annual median and 75th percentile acidity and dissolved aluminium concentration. Aquatic ecosystem thresholds for the Recovering and Recovered states also shown (Bathurst, 2026b)***

The water quality between sites S14C and S14B improves due to diluting inflows from tributary waterways with non-AMD impacted water quality. Based on rehabilitation, dilution from these non-AMD impacted waterways, and acidity decay rates, the future dissolved aluminium concentrations at sites S14B and Mangatini Falls are estimated to be suitable for fish and macroinvertebrates (i.e., annual 75th percentile dissolved aluminium < 1 mg/L) within the next 80 years and improve steadily over time (Instream, 2026).

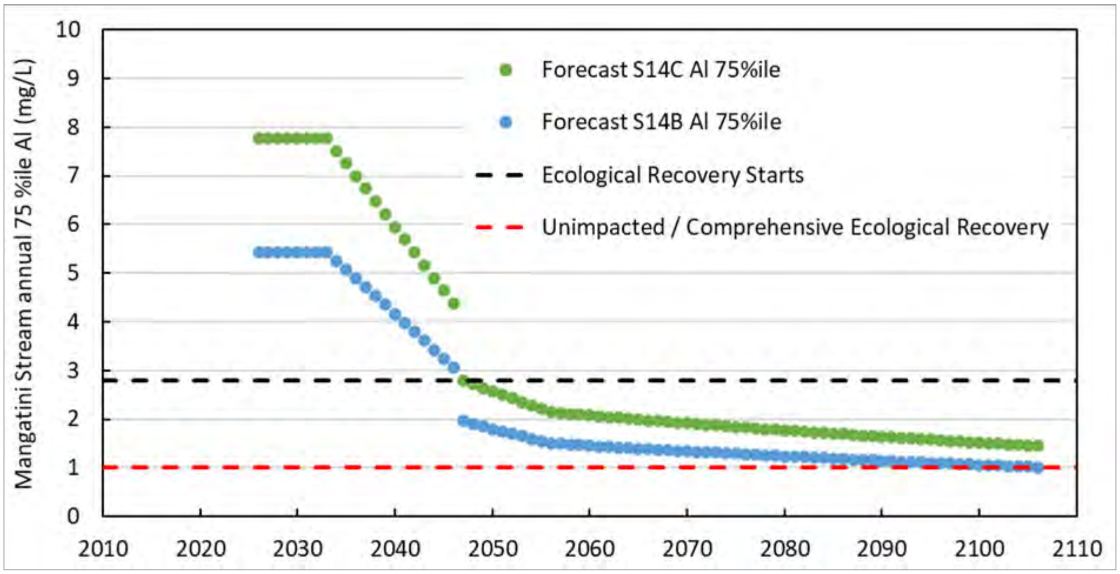


Figure 6-5. Forecast long term annual 75th percentile dissolved aluminium concentration at S14C and after additional dilution at S14B Mangatini Stream sites S14C and S14B and aquatic ecosystem thresholds for Recovering and Recovered states (source: Bathurst, 2026b)

[redacted]

6.2.6 Millerton Block

This section of the report summarises the key findings from the AMD modelling forecasts of waterway quality from the Millerton Water and AMD Management report (Bathurst, 2026a). The findings have been used to evaluate future impacts on aquatic ecosystems because of water management proposed under the Millerton Water and AMD Management Plan (Bathurst, 2026f).

The Millerton Block is currently and was also historically, the most AMD impacted catchment at Stockton. As such, most waterways are in an existing impacted state.

6.2.6.1 Betterment reference values

The AMD modelling undertaken by Bathurst (2026a) suggests that ongoing AMD generated from remnant historic underground workings outside the Project opencast footprint will prevent water quality improving sufficiently for aquatic ecosystem recovery in Millerton Block waterways (Granity Stream, Mine Creek and Miller Stream) over the next 80-years (Instream, 2026). Therefore, time-dependent 'Betterment reference (water quality) values' for acidity loads and acidity / dissolved aluminium concentrations were modelled for the period 2010 – 2106 (Bathurst 2026a) to provide a baseline value, guide the long-term AMD management of these specific waterways and track improvements overtime. The Betterment reference values key assumptions are:

- No opencast mining in the Millerton Block.
- Millerton Block underground workings remain at the 2010 extent and untreated.
- The load / concentration change from 2010 – 2106 is solely due to acidity decaying at a rate of 0.62% per year.

Figure 6-6 provides a conceptual summary of the waterway quality relative to Betterment reference values for dissolved aluminium and trends for the managed effects. Figures that describe the detailed changes in dissolved aluminium relative to the Betterment reference values are provided in Sections 6.2.6.5 to 6.2.6.7.

A full description of the recent historic and forecast water quality at each site (acidity loads and concentrations as well as dissolved aluminium), including the unmanaged effects is provided in the Millerton Water and AMD Management Plan (Bathurst, 2026a).

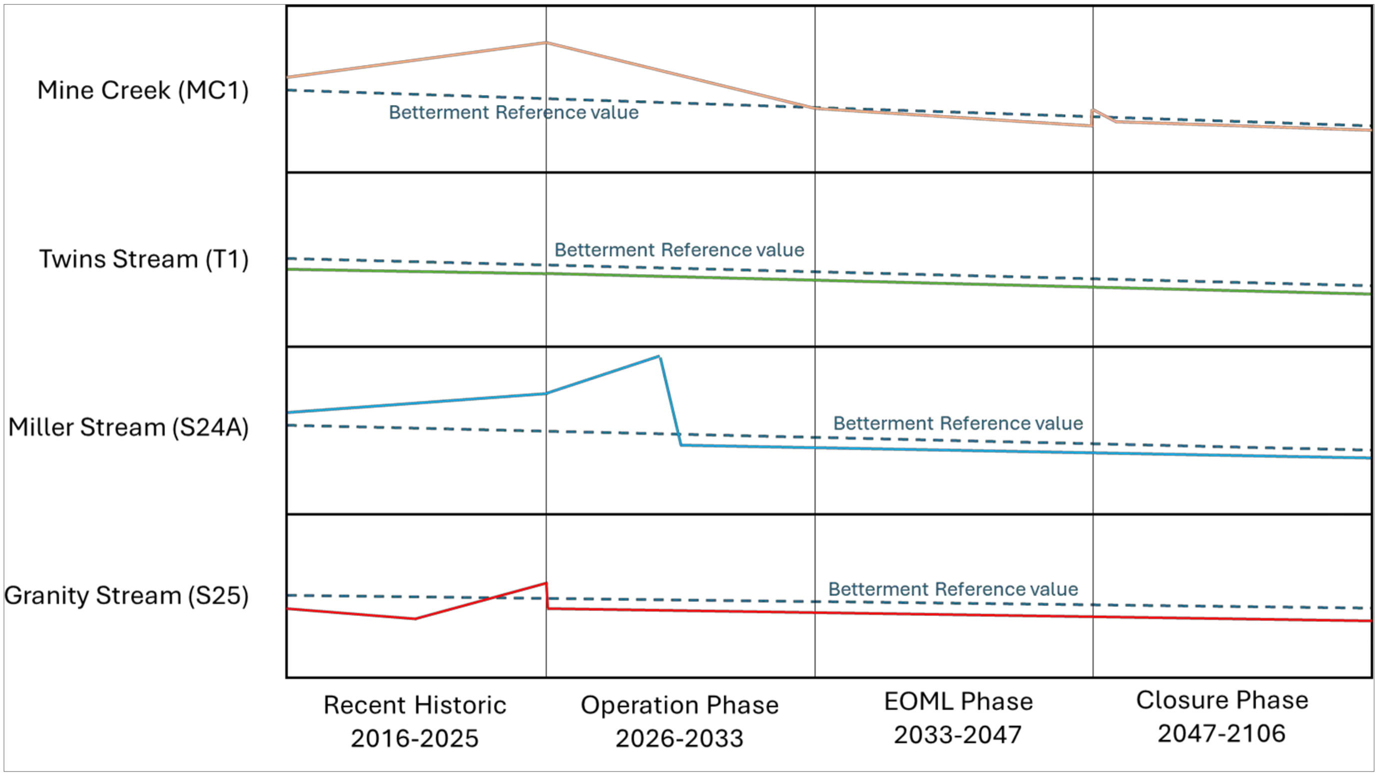


Figure 6-6 ***Conceptual summary of Millerton Block waterway quality (recent historic and forecast) relative to Betterment reference values) for dissolved aluminium and trends over time***

6.2.6.2 Recent historic water quality (2016 – 2025)

Apart from Twins Stream, the recent historic dissolved aluminium concentrations rise above the Betterment reference values with generally increasing trends(Figure 6-6). The main cause is injection of AMD impacted water from the Millerton opencast pit into underground workings for fire suppression. Untreated AMD water then discharges from various underground workings into these downstream waterways (Bathurst, 2026a).

6.2.6.3 Managed operation phase water quality (2026 – 2033)

During the operation phase (2026 – 2033), the managed effect on dissolved aluminium concentrations is forecast to result in overall decreasing concentrations despite the continuation of fire suppression through to 2028 (Figure 6-6). This decrease is a result of Millerton Block AMD treatment from ELF construction, NAF capping of PAF material, transition to final landform surfaces and ceasing exposure of fresh highwall / coal floor surfaces. Despite the improvement, Mine Creek (MC1) is forecast to take until the end of mining (2033) before dissolved aluminium concentrations drop below the Betterment reference values.

The one exception to the forecast deceasing trend during the operation phase is Miller Stream (S24A) where dissolved aluminium (along with acidity) will continue to increase to 2028 due to fire suppression. In 2029, concentrations are forecast to drop rapidly and fall below the Betterment reference values from 2029.

6.2.6.4 Managed EOML and closure phases water quality (2033 – 2106)

During the EOML (2033 – 2047) and closure (2047 and onwards) phases, there will be continued waterway quality improvement, resulting in a decline and acidity / dissolved aluminium concentrations falling below the Betterment reference values (Figure 6-6). This improvement comes from landform reshaping / revegetation and rehabilitation of Millerton ELF, ceasing exposure of fresh highwall / coal floor surface, treatment of water at MW16 Sump and acidity decay.

The one exception is a six-year period on Mine Creek (MC1) at the start of closure (2047) where the acidity and dissolved aluminium is forecast to increase from fire suppression. However, a higher degree of treatment is proposed to ensure that concentrations and loads do not exceed the Betterment reference values.

6.2.6.5 Mine Creek

Mine Creek is monitored in its headwaters at sites S6 and S23 and close to its discharge into the Ngākawau River at MC1. MC1 is currently in an impacted state with severely impacted macroinvertebrate communities (Instream, 2026). Betterment reference values are not met through the Operational Phase (2027 – 2033). Discharges from Mine Creek during this time also pose a temporary risk to fish recruitment in the lower Ngākawau River, as contaminant levels due to fire suppression will rise. However, no impact has been observed to date from the current fire suppression discharges (Instream, 2026).

Even with improvements under the proposed water and AMD management, the remnant historic underground workings located outside of the Millerton opencast disturbance footprint are expected to contribute sufficient AMD to prevent aquatic ecosystem recovery at MC1 within the next 100 years, though concentrations are below the betterment reference values (i.e., achieving the betterment objective) (Figure 6-7). However, recovering sate could be potentially reached within the next ~150-years due to acidity decay.

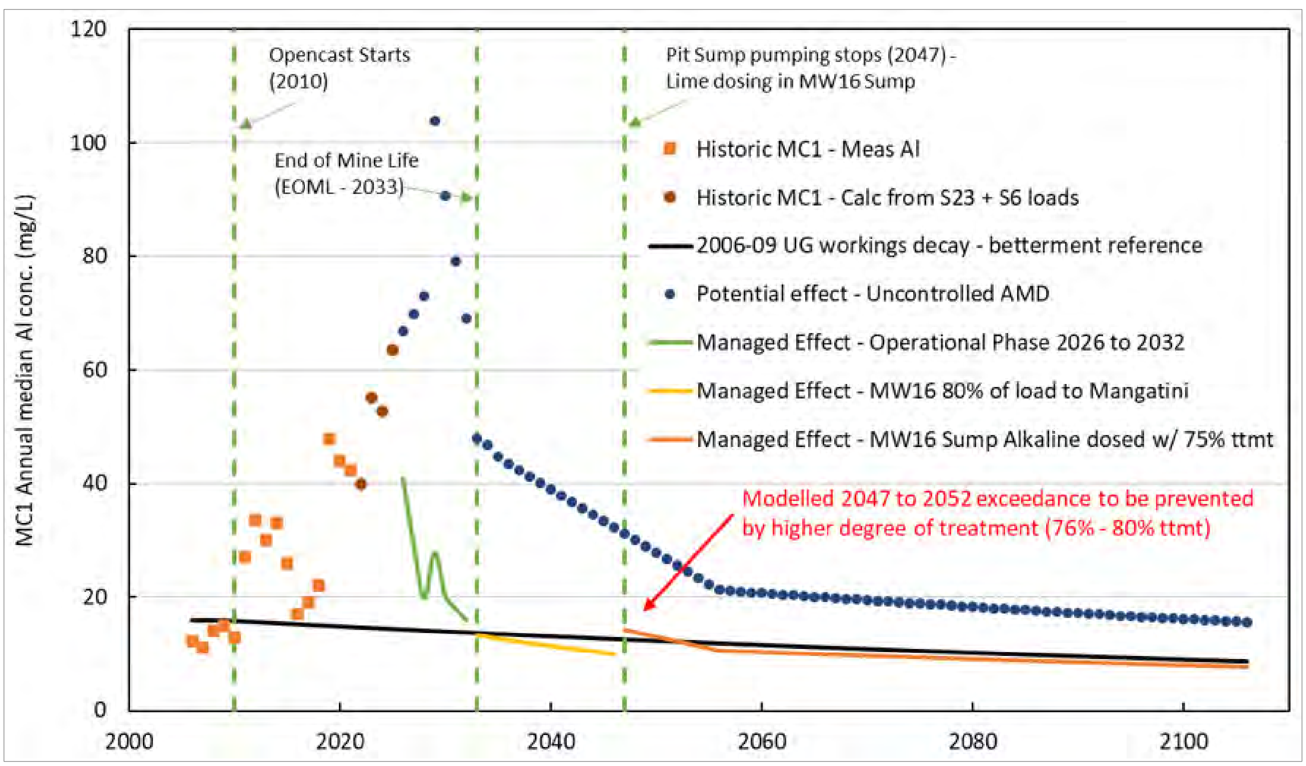


Figure 6-7 Measured and forecast annual median dissolved aluminium concentration at Mine Creek site MC1 over 80 years (source: Bathurst, 2026a)

6.2.6.6 Granity Stream and Miller Stream tributary

Miller Stream site S24A (Granity Stream east tributary) has poorer water quality compared to Granity Stream site S25 (Granity Stream west tributary) (Figure 6-8). This is also reflected in the macroinvertebrate communities at S24A. Planned water treatment after mining ceases in 2033 will remove most of the AMD discharges. Water management results in dissolved aluminium concentrations below the betterment reference values over the next 80-years. However, water at Miller Stream near S24A and Granity Stream at S25 will still be unsuitable for macroinvertebrates and fish without further action due to untreated historic underground workings (Instream, 2026).

Granity Stream site GB1 is located at the state highway, downstream of the Granity Stream (S25) and Miller Stream (S24A) confluence. With no major cleanwater tributaries and due to ongoing AMD discharges, GB1 is unlikely to change to a recovering state within the next 80-years (though could potentially reach this in ~150 years due to acidity decay. However, AMD contamination to the ocean will decrease over time due to natural decay, reducing residual risks to the marine environment (Instream, 2026).

6.2.6.7 Rudolph and Twins Stream

The future source of AMD to Rudolph Stream will be untreated historic underground workings located outside the Stockon CML near Rockies Coal Mine. This AMD load from this discharge is expected to drop overtime from acidity decay. The proposed catchment diversion (~1 ha) for Twins Pit will slightly reduce the 7-day Mean Annual Low Flow (MALF) from 5 L/s - 4.9 L/s at Rudolph Stream. However, since the upper Rudolph Stream lacks ecosystem values, this minor flow reduction is not expected to impact aquatic ecosystems (Instream, 2026).

Although predicting water quality at upper catchment Twins Stream monitoring site T1 during mining operations is challenging, plans for water management during operations (pit sumps pumped to Mangatini / Granity for treatment / controlled discharge) and a final landform design incorporating only highwall and coal floor surface types are expected to bring a gradual decrease in dissolved aluminium Figure 6-9. Despite this, Twins Stream site T1 is expected to remain an impacted site within the next 80-years with dissolved aluminium concentrations well above 2.8 mg/L and require further treatment (Instream, 2026). The time to reach a recovering state due to long-term acidity decay would be in the order of ~150 years. Dissolved aluminium concentrations at T1 are below betterment reference values (achieving betterment objective) are expected through Operational, EOML, and Closure Phases (Instream, 2026).

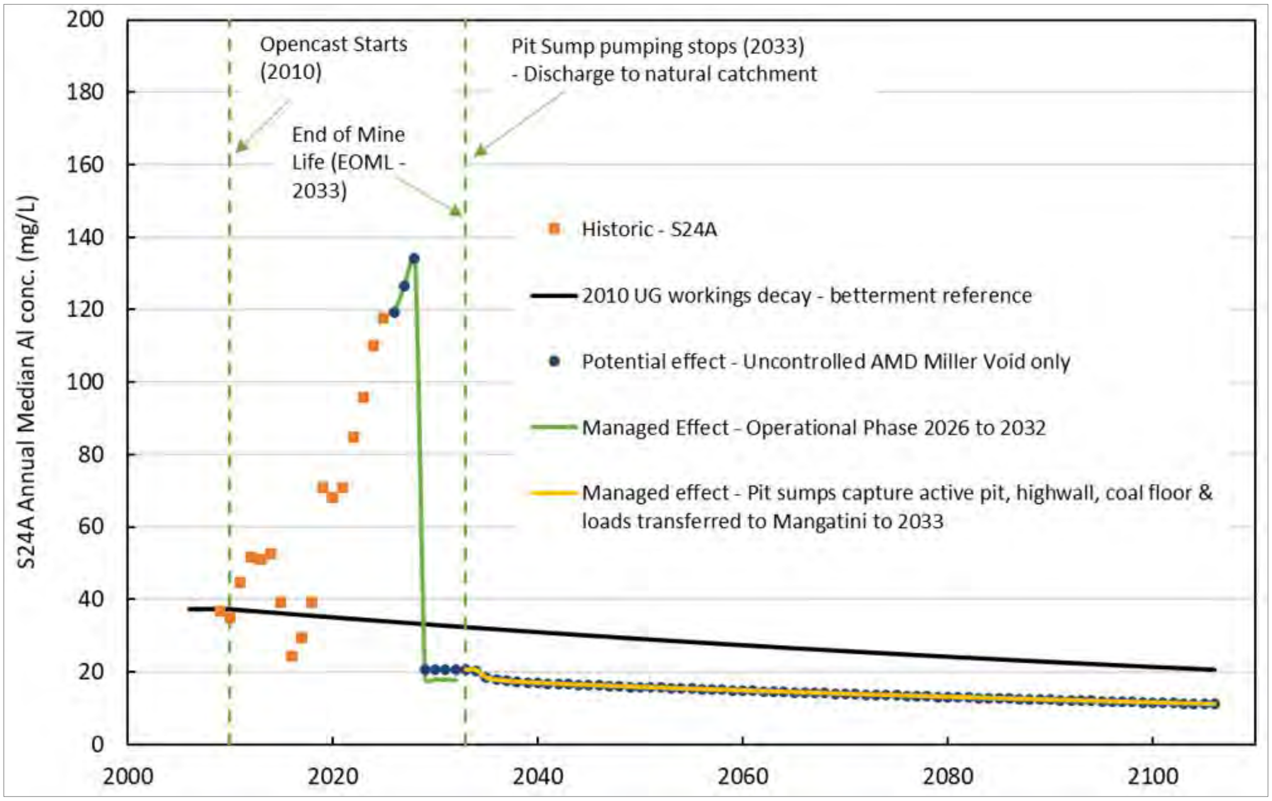
The lower Twins Stream site T3 at the State-Highway is in a recovering state compared to T1, and the macroinvertebrate community is more diverse. After mining ends in 2033, continued water quality improvement is expected to result a shift to a recovered state (Instream, 2026).

6.2.7 St Patrick catchment

Mining in the St Patrick catchment including Fly Creek, Plover, and McCabes areas is largely complete, and additional mining / backfill activities are assumed to not increase current acidity concentrations (Bathurst, 2026b).

The water quality in St Patrick Stream, Fly Creek, and Plover Stream is expected to improve as additional rehabilitation is completed and the McCabes Sump is fully optimised to treat AMD from Fly Creek and Plover Stream. Remediation of 266 hectares in the St Patrick catchment is projected to lower acidity and dissolved aluminium concentrations at site S16, with granite and soil capping of overburden estimated to reduce acidity load and concentration by 23% from 2025 levels. Beginning in 2033, treatment of Plover Creek is anticipated to further decrease S16 acidity load and concentration by ~21% compared to pre-treatment conditions (Instream, 2026).

Significant ongoing mining at Cypress is scheduled until EOML in 2031. Increased acidity load from Cypress is anticipated through this period. However, effective operation of capture sumps and pump / pipelines has resulted in a significant reduction in acidity loads to St Patrick Reservoir as key AMD sources (e.g., Cypress Pit and the Northern ELF) are diverted to LDP2 / McCabes Sump. As such, Cypress is not expected to cause an increase in acidity at St Patric Stream site S16 over the remainder of the project (Bathurst, 2026b). The Cypress mining project will also be fully rehabilitated within the next 15 years, allowing McCabes Sump to be optimised to treat more Fly Creek and Plover Stream AMD. This will lead to further water quality improvements at S16 (Bathurst, 2026b).



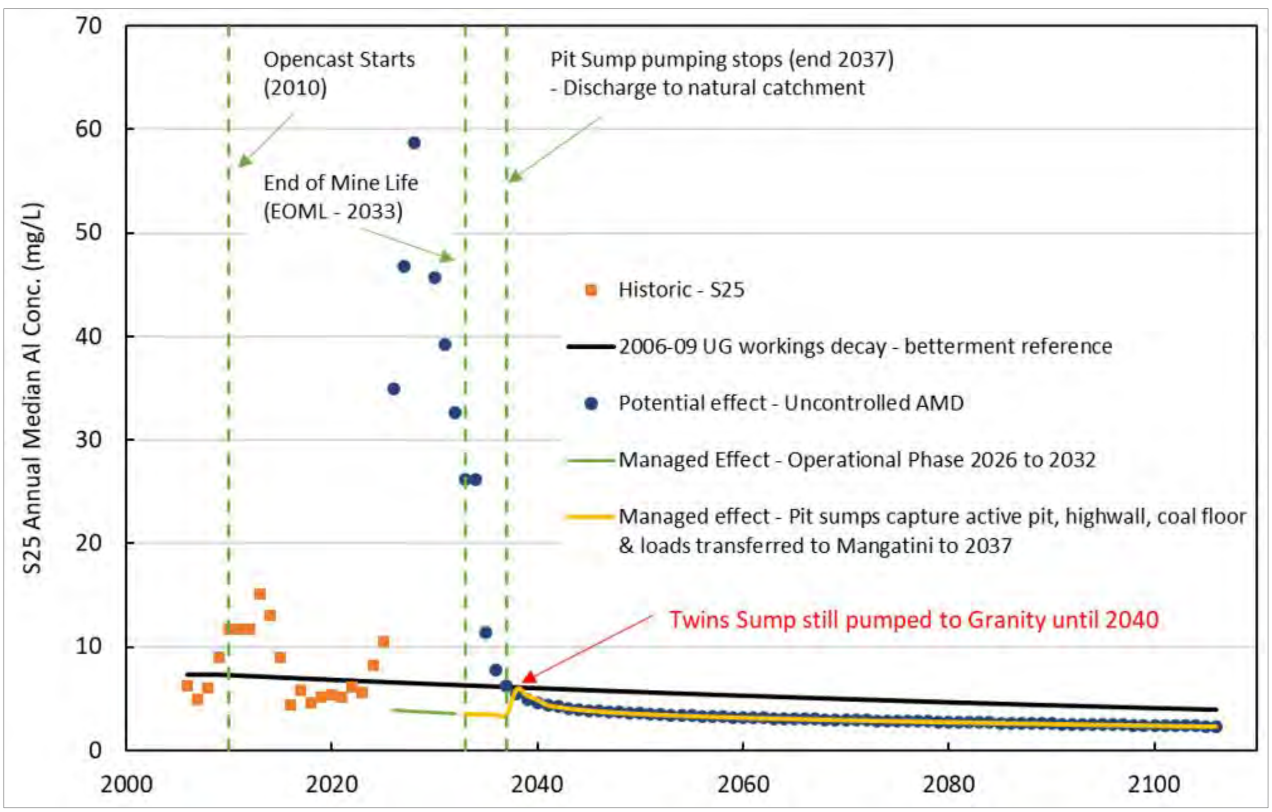


Figure 6-8 ***Measured and forecast annual median dissolved aluminium concentration at Miller Stream site S24A (Granity Stream east tributary) (top) and Granity Stream (west tributary) (bottom) over 80 years (source: Bathurst, 2026a)***

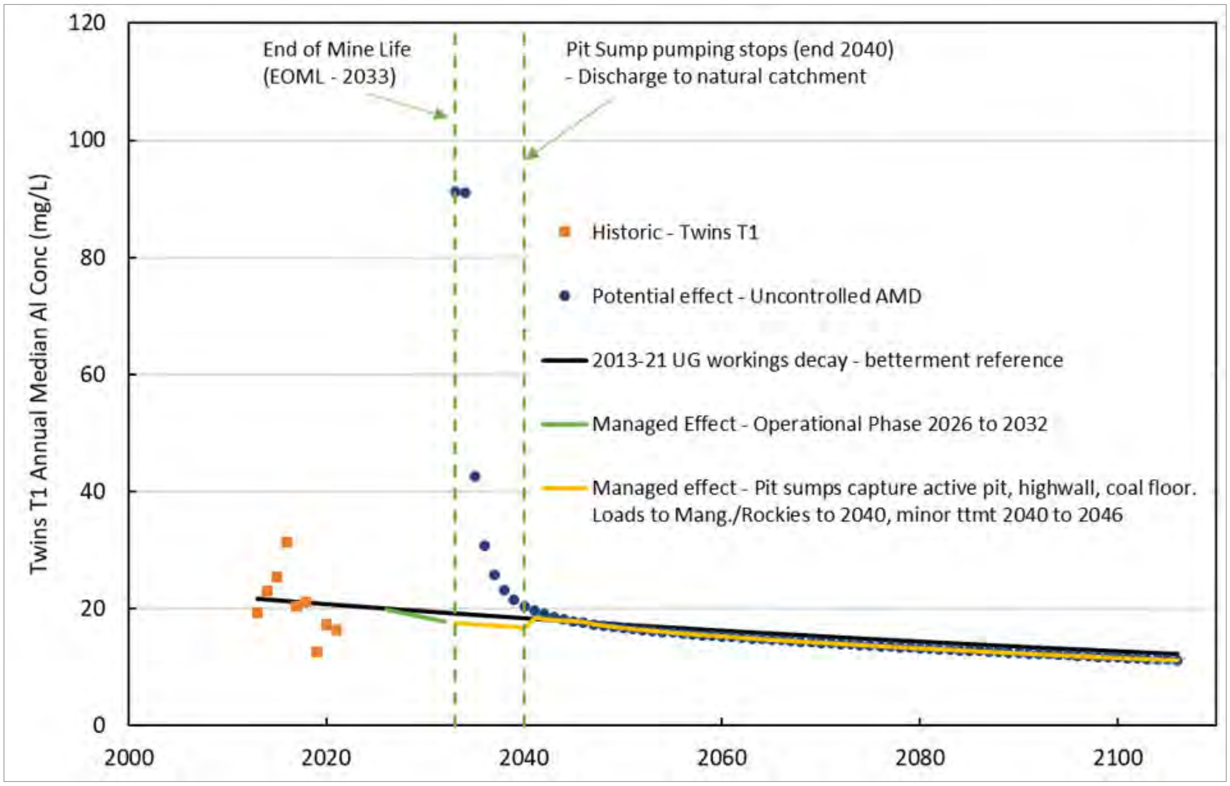


Figure 6-9 ***Measured and forecast annual median dissolved aluminium concentration at Twins Stream site T1 over 80 years (source: Bathurst, 2026a)***

6.2.7.1 St Patrick Stream

St Patrick Stream site S16 was used to forecast water quality for the wider St Patrick Catchment (Bathurst, 2026b). The forecast acidity and dissolved aluminium concentrations in Figure 6-10 show:

– The annual 75th percentile dissolved aluminium concentration falls below the 2.8 mg/L criteria for recovering state aquatic ecosystem in 2034.

– The forecasted annual 75th percentile dissolved aluminium concentration does not fall below the 1 mg/L criteria at S16 for a recovered ecosystem within 80-years.

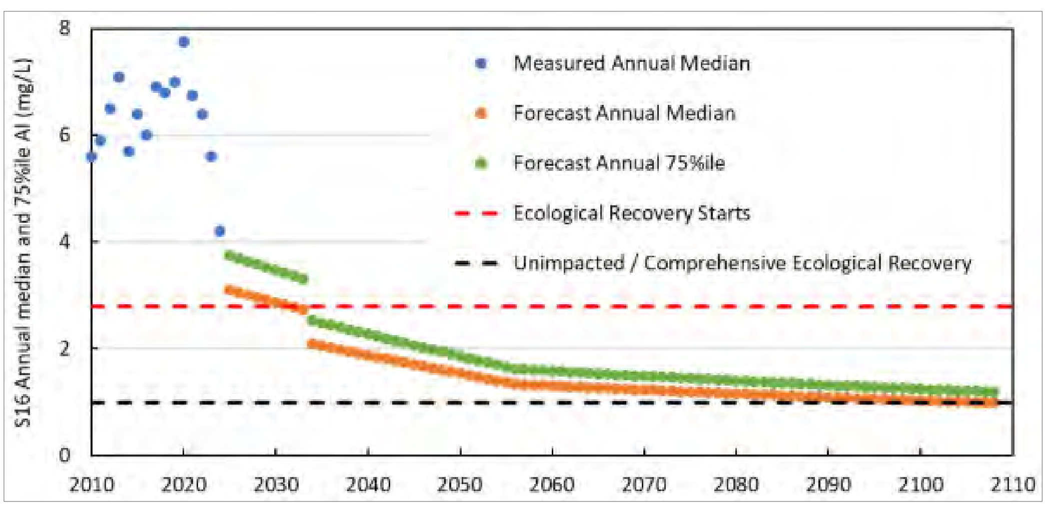


Figure 6-10 ***St Patrick Stream site S16 measured and forecast acidity and dissolved aluminium concentration. Aquatic ecosystem thresholds for the Recovering and Recovered states also shown (Bathurst, 2026b)***

The non-AMD impacted T35 Stream flowing into St Patrick Stream ~1 km downstream of St Patrick Stream site S16, resulting in dilution of AMD impacted upstream water and an improvement in water quality. This is expected to be sufficient to achieve the thresholds for recovery of aquatic ecosystems (annual 75th percentile dissolved aluminium < 1 mg/L) in the St Patrick Stream downstream of the confluence with T35 by ~2080. Several other large tributaries join St Patrick Stream between T35 Stream and the Ngākawau River confluence. In particular, the water quality in Erin Stream is not impacted by AMD. This stream drains a large pākihi wetland with high concentrations of Dissolved Organic Cabon (DOC). DOC is a modifying factor for aluminium and other metals that reduces toxicity to aquatic ecosystems. Accordingly, the St. Patrick Stream below Erin Stream is likely to undergo recovery sooner than sites S16 and downstream of T35 via dilution and toxicity modification (Instream, 2026).

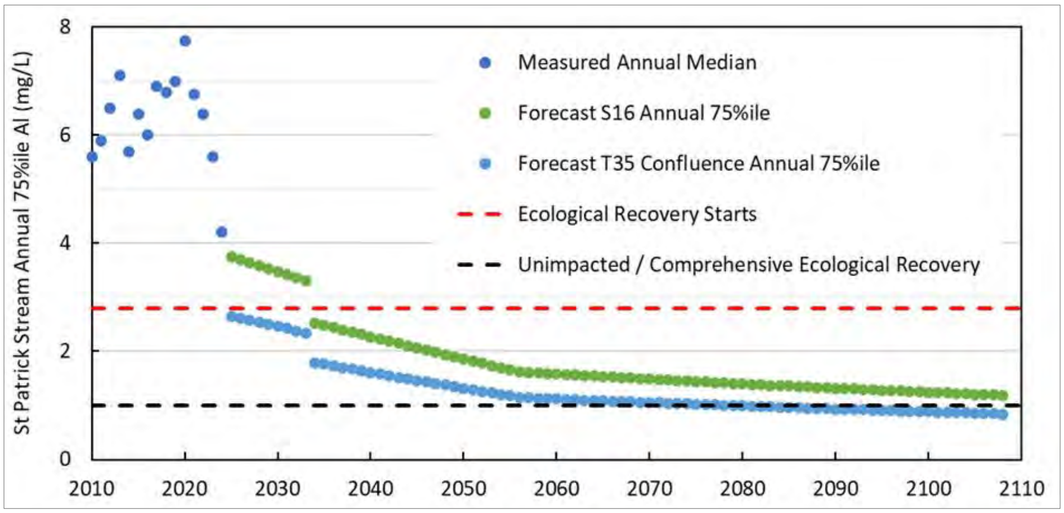


Figure 6-11. Forecast long term annual 75th percentile dissolved aluminium concentration at S16 and after additional dilution downstream of the T35 Stream confluence and aquatic ecosystem thresholds for Recovering and Recovered states (Bathurst, 2026b)

6.2.8 Upper Waimangaroa catchment

No changes to water management in the Herbert and Whirlwind Streams (draining the Upper Waimangaroa Catchment) are proposed under the BPCP, other than final landform construction and rehabilitation. Provided the passive Whirlwind MSR treatment system continues to operate with periodic maintenance overall water quality in the Upper Waimangaroa Catchment is expected to gradually improve. As a result, the Whirlwind Stream is expected to change from a recovering to recovered aquatic ecosystem state within 80-years.

6.2.9 Water users

6.2.9.1 Surface water

[redacted]

[redacted]

[redacted]

[redacted]

6.2.9.2 Groundwater

[redacted]

6.2.10 Cultural impact

The 2026 Cultural Impact Assessment (CIA) prepared by Te Rūnanga o Ngāti Waewae for the BPCP evaluates the cultural, environmental, and spiritual impacts of the proposed project on Ngāti Waewae and Poutini Ngāi Tahu values, providing recommendations to mitigate adverse effects and ensure the protection of cultural heritage and natural resources.

Ngāti Waewae's priorities include protecting headwaters, aquatic resources, and wetlands; rehabilitating degraded lands and waters; and enhancing mahinga kai habitats and protecting indigenous biodiversity, including taonga species. Key adverse effects identified by Ngāti Waewae as requiring avoidance over the duration of the project include water quality deterioration; unnatural sediment deposition or flow; and the loss of aquatic resources, mahinga kai habitats, and wāhi tapu/wāhi taonga. These priorities align with the preservation of key cultural values and spiritual connections to the maunga, whenua, and waterways, as well as the principles of holistic environmental management and protection of mauri and taonga.

With the proposed BPCP, there are potential cultural impacts such as modifications of landscapes causing original placenames to be 'displaced', access restrictions to certain areas, modification to the flora and fauna. Bathurst have addressed many of these concerns, as documented in the CIA, including considerable effort to address loss of mahinga kai species. Recommendations from the impact assessment are outlined in Section 7.4, and fully described in the Cultural Impact Assessment 2026 report.

Ngāti Waewae acknowledges the socio-economic benefits and compensation measures proposed by Bathurst but emphasises the importance of ongoing dialogue, monitoring, and mitigation to address cultural and environmental concerns.

6.3 Future impacts without the BPCP

If the BPCP is not granted, upon closure of the Stockton Mine, BT Mining is contractually obligated to return the land to the Crown. At that point, BT Mining will no longer be responsible for the ongoing treatment of legal AMD historically caused by historic mining of the Crown.

If treatment ceased at Stockton in this scenario, the modelled water quality at site NR in the Ngākawau River (~200 m upstream of the Mine Creek confluence) indicate that the river would immediately become unsuitable (dissolved aluminium > 1 mg/L [redacted] to pass through and reach the upper Ngākawau headwaters (Figure 6-12). This would result from increased acidity and dissolved aluminium concentrations caused largely by historic mining operations in the two main up-gradient tributaries - Mangatini and St Patrick Streams, with resultant impacts to these tributaries as well.

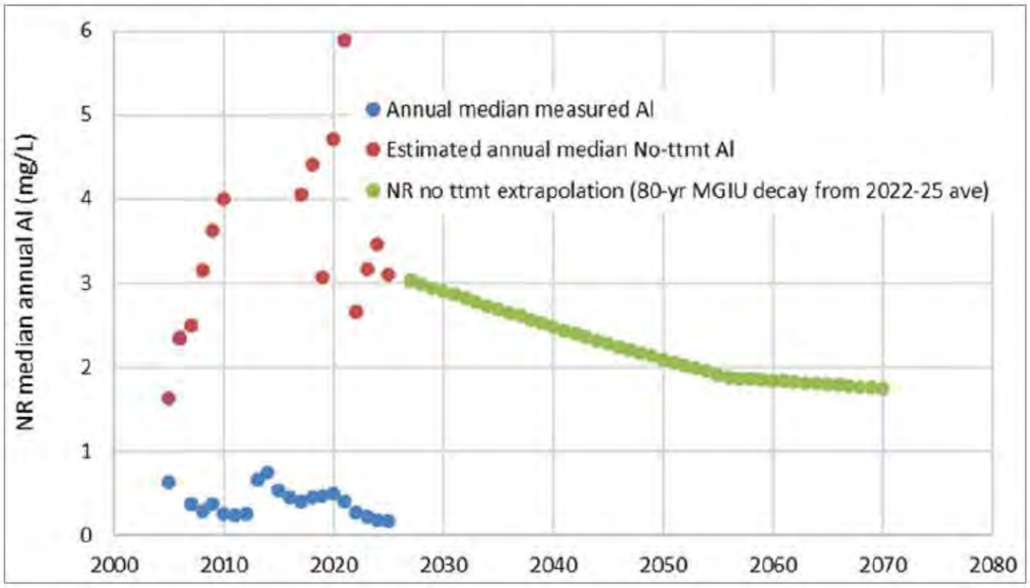


Figure 6-12 Dissolved aluminium annual median concentrations at lower Ngākawau River site NR (upstream of Mine Creek confluence) if current AMD treatment ceased (source: Bathurst)

Since active AMD treatment began at Stockton with AMD neutralisation in the Mangatini Sump in 2009, independent fish surveys have recorded the [redacted]

Without the BPCP and associated water treatment, a significant regression in waterway quality would be expected, unless the Crown undertakes ongoing water quality management at least equivalent to that currently in place.

The BPCP will ensure that the current operational AMD management team and infrastructure (including two AMD treatment plants) remain working on site so that AMD management is maintained and future AMD required infrastructure to be confirmed via the Crown (via LINZ led) 5-year optimisation project from 2026 – 2030, will be implemented (post 2030) and optimised in the BPCP consent period.

7. Recommendations, proposed consent conditions and monitoring

This section provides recommendations for future work and consenting and proposed consent conditions and monitoring of surface water, groundwater and sludge to manage future AMD impacts on waterways. A detailed discussion of the proposed future surface waterway monitoring of water quality, sediment quality and aquatic ecosystems is provided in Instream (2026). The proposed future groundwater monitoring is provided in GHD (2026).

7.1 Surface water

7.1.1 Water quality

Future waterway monitoring is needed so that incremental changes in water quality and aquatic ecosystem state can be tracked over time and reported. In addition, this monitoring will enable an assessment against the thresholds and Betterment reference values for waterways draining the Millerton Block. The monitoring design considers the location, periodicity and focus of sampling and establishes suitable thresholds for reporting.

Because a broad range of waterways exist ranging from a natural water quality state to an AMD impacted state, the staged monitoring design shown in Figure 7-1 is proposed (by Instream, 2026). This design provides a tailored suite of water quality and aquatic ecosystem monitoring specific to the waterway state. The waterway state is initially classified based on water quality and aquatic ecosystems criteria as defined by Instream (2026).

The monitoring site locations are shown in Figure 3-14.

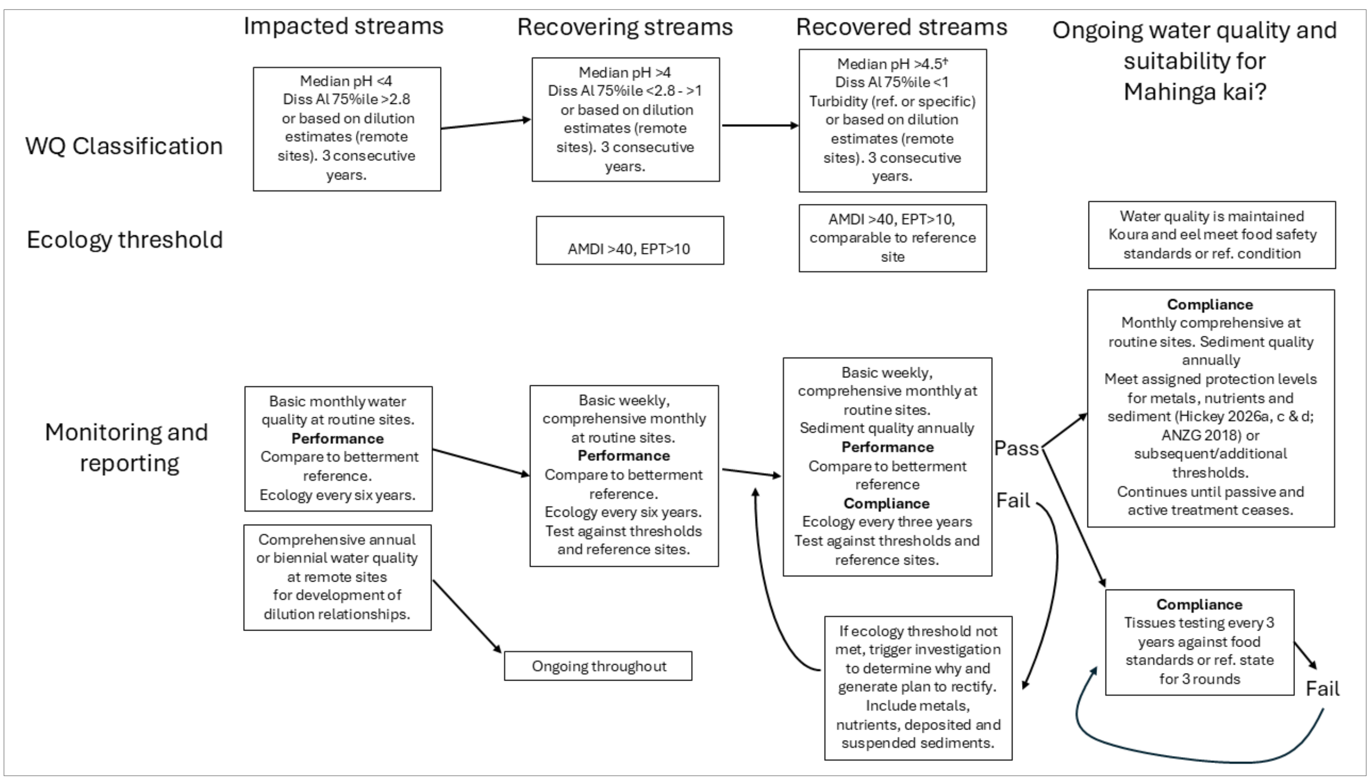


Figure 7-1 ***Schematic of staged monitoring design across a gradient of stream recovery, unless caused by natural processes. Note the inclusion of Reference sites in threshold testing in Recovered streams (source: Instream, 2026)***

A key aspect of the BPCP will be the transition from an improvement management approach in water quality recovering or impacted state waterways, to a protection management approach for a water quality and ecology Recovered waterway, as rehabilitation over the consent term progresses. Over time, the ultimate objective is waterway improvement / recovery that enables mahinga kai species to be harvested in any Recovered or natural state waterway. Details of the waterway monitoring based on aquatic ecosystem state as proposed under the BPCP are provided in Table 7.1 and in discussed in Instream (2026).

Table 7.1 Waterway monitoring based on aquatic ecosystem state as proposed under the BPCP (adapted from Instream, 2026)

Monitoring	Aquatic ecosystem state					
	Impacted	Recovering	Recovered	Natural		Recovered or Natural
			Recovered	Reference sites	Current healthy / protected	Mahinga kai
Waterway quality monitoring parameters	Basic water quality monitoring: – pH, EC, TSS, Turbidity – Acidity – Sulfate – Dissolved Al, Zn	Basic water quality monitoring; and Comprehensive water quality monitoring: – pH, EC, TSS, Turbidity – Acidity – Sulfate – Dissolved Al, Zn, Fe, Ni, Cu, Ni, Cu, Co, Cd, Cr, Mn – Ca, Mg – DOC – Nitrate-N – Ammoniacal-N – Dissolved Inorganic Nitrogen (DIN)	Comprehensive water quality monitoring.	Comprehensive water quality monitoring.	Comprehensive water quality monitoring.	Comprehensive water quality monitoring.
Waterway quality monitoring frequency	Basic monthly	Basic weekly. Comprehensive monthly.	Basic weekly. Comprehensive monthly.	Comprehensive monthly (at least)	Comprehensive monthly (at least)	Basic weekly. Comprehensive monthly.
Aquatic ecosystem monitoring parameters	– Bryophytes – Macro-invertebrates – Habitat characteristics	– Bryophytes – Macro-invertebrates – Fish – Habitat characteristics	– Bryophytes, – Macro-invertebrates – Fish – Habitat characteristics	– Bryophytes – Macro-invertebrates – Fish – Habitat characteristics	– Bryophytes – Macro-invertebrates – Fish – Habitat characteristics	– Tissue testing of mahinga kai
Aquatic ecosystem monitoring frequency	Six yearly	Six yearly	Three yearly	Every three to five years (depending on the status of impact site compared with)	Annual	Three yearly

The monitoring proposed in Table 7.1 will be applied across Stockton waterways in accordance with the monitoring framework set out in the '*Stockton Mine Water Environmental Management Plan'* - STO-ENV-PLN-013.

The waterway monitoring sites are proposed to be classified under three categories, 1) Compliance, 2) Performance and 3) Reference defined by Instream (2026) for assessing water quality impacts on aquatic ecosystems. A summary is provided in Table 7.2.

Table 7.2 Summary of the Proposed Stockton water quality monitoring site type under the BPCP

Waterway monitoring site type	Site description	Monitoring purpose	Consent compliance limits	Reporting frequency	Review frequency
Compliance	Locations where specific, enforceable water quality limits are set.	To demonstrate that the mine is meeting its legal obligations and to protect ecological values (limits set out in Table 7.3).	Yes	Annual compliance reporting or exceedance based	6-yearly
Performance	Locations where water quality is monitored to track long-term trends and improvements.	To assess progress toward the recovery or betterment targets.	None	Annual as part of compliance reporting	6-yearly
Reference	Current waterway quality exists in a natural state, not impacted by mining.	Determine whether any changes at the Compliance and Performance sites is the result of Stockton mining activities or broader variation and changes in the background conditions. For example, impacts from a long dry period.	None	Annual as part of compliance reporting	6-yearly

Table 7.3 summarises the waterway quality monitoring. It includes the current consent compliance limits and the compliance, performance, and reference site monitoring proposed by Instream (2026). Monitoring is proposed in all catchments impacted by historic and contemporary Stockton mining activities. The basis for the proposed monitoring is described in Instream (2026).

The monitoring is proposed to be subject to revision every 6 years at the discretion of the regulatory authority. The 6 yearly reviews will specifically include a comparison against betterment reference values and the forecasted water quality over time (Instream, 2026).

The monitoring adopts the use of pH, dissolved aluminium and turbidity as key proxies for assessing ecological effects of AMD and is indicators of other potential contaminants as discussed by Instream (2026).

Table 7.3 Proposed Stockton water quality monitoring and compliance criteria / assessment with the BPCP (sources: Bathurst; Instream, 2026)

<table>
<tr><th rowspan="2">Catchment</th><th rowspan="2">Site details (Reference sites highlighted in blue)</th><th>Current (none if blank)</th><th colspan="7">BPCP proposed (none if blank) from Instream (2026)</th></tr>
<tr><th>Consent compliance limits</th><th>Reporting type (reference sites shaded blue)</th><th>Sampling regime</th><th>Reporting analytes</th><th>Annual 5TH percentile</th><th>Rolling annual median</th><th>Annual upper percentile</th><th>Rolling median</th></tr>
<tr><td rowspan="10">Ngākawau River</td><td rowspan="7">Ngākawau River
NR2

Note: Site NR was destroyed and access curtailed in 2021. Site NR2 has been used as a proxy</td><td rowspan="6">**Consent: RC06206 v8**
pH > 4.0 based on a 30-day rolling median (daily weekday sampling)
Hardness < 500 mg/L: Monthly samples pH <7.5, daily pH >7.5, 4 day rolling mean
Turbidity < 25 NTU based on a 30-day rolling median (daily weekday sampling)
Dissolved aluminium: 99% of samples below community value of 1 mg/L (daily weekday sampling).
Consent: RC07011
Thallium < 0.04 mg/L (monthly sampling)</td><td rowspan="3">Compliance</td><td rowspan="3">Daily weekday</td><td>Turbidity (NTU)</td><td>-</td><td>< 10</td><td>< 48 (95th)</td><td>< 25 (15 samples)</td></tr>
<tr><td>Dissolved aluminium (mg/L)</td><td>-</td><td>-</td><td>< 1 (75th)</td><td>< 1 (15 samples)</td></tr>
<tr><td>pH</td><td>>4.5</td><td>-</td><td>< 7.5 (95th)</td><td>> 4.5 & < 7.5 (15 samples)</td></tr>
<tr><td>Compliance</td><td>Weekly</td><td>Nitrate-N (mg/L)</td><td>-</td><td>< 2.4</td><td>< 3.5 (95th)</td><td>-</td></tr>
<tr><td>Compliance</td><td>Weekly</td><td>Ammoniacal-N (mg/L)</td><td>-</td><td>< 0.69 mg/l
assuming a pH of 6</td><td>< 1.1 mg/l assuming a pH of 6</td><td>-</td></tr>
<tr><td>Compliance – During LDS discharge</td><td>Continuous</td><td>Turbidity (NTU)</td><td colspan="4">- Adhere to the operating regime and monitoring procedures set out in the Mangatini Sump Management Plan; and
- Comply with the turbidity limits as set out in Table 1.
Table 1: Flow conditions and turbidity at S14B and NR2 during LDS discharge<table><tr><th>Flow Percentile band (%)</th><th>Flow rates S14B (m^3s^{-1})</th><th>LDS discharge to stream</th><th>Turbidity averaged over 8 hours NR Two (NTU)</th></tr><tr><td>95+</td><td>7.349+</td><td>Yes</td><td>n/a</td></tr><tr><td>90 – 95</td><td>3.373 to 7.349</td><td>Yes</td><td>100</td></tr><tr><td>80 – 90</td><td>1.672 to 3.373</td><td>Yes</td><td>50</td></tr><tr><td>70 – 80</td><td>1.139 to 1.672</td><td>Yes</td><td>25</td></tr><tr><td>0 – 70</td><td>0 to 1.139</td><td>No</td><td>25</td></tr></table></td></tr>
<tr><td>-</td><td>Performance</td><td>Weekly (Comprehensive suite)</td><td>Al, EC, pH, Zn, Fe, Ni, Cu, Co, Cd, Cr, Mn, Ca, Mg, Dissolved Organic Carbon (DNPOC)</td><td colspan="4">Performance tracking No compliance limits. Subject to 6-yearly review.</td></tr>
<tr><td rowspan="2">Ngākawau River
NRB Bridge</td><td rowspan="2">-</td><td>Performance</td><td>Daily weekday</td><td>Dissolved aluminium, pH, EC, turbidity</td><td colspan="4">Performance tracking No compliance limits. Subject to 6-yearly review.</td></tr>
<tr><td>Performance</td><td>Weekly (Comprehensive suite)</td><td>Ammoniacal-N, Nitrate-N, turbidity, Al, EC, pH, Zn, Fe, Ni, Cu, Co, Cd, Cr, Mn, Ca, Mg, Dissolved Organic Carbon (DNPOC)</td><td colspan="4">Performance tracking No compliance limits. Subject to 6-yearly review.</td></tr>
<tr><td>Ngākawau Coal handling facility discharge
S32B</td><td>**Consent: RC01104**
Daily sampling (weekday only)
pH > 4.0 based on a 30-day rolling median.
Total suspended solids:
• 10 sample rolling median < 50 mg/L
• 92%ile (11/12 annual samples) < 150 mg/L
Turbidity:
• 10 sample rolling median < 75 NTU
• 92%ille (11/12 annual samples) < 250 NTU
• Mean telemetry samples < 120 NTU
• Telemetry samples 95%ile < 300 NTU</td><td>Compliance</td><td>Daily weekday</td><td>pH, total suspended solids, turbidity</td><td colspan="4">**Rollover from RC01104**</td></tr>
</table>

Catchment	Site details (Reference sites highlighted in blue)	Current (none if blank)	BPCP proposed (none if blank) from Instream (2026)						
		Consent compliance limits	Reporting type (reference sites shaded blue)	Sampling regime	Reporting analytes	Annual 5TH percentile	Rolling annual median	Annual upper percentile	Rolling median
Mangatini	Mangatini Stream **S14B**	**Consent: RC06206-V8** pH > 4	Performance	Daily weekday	Dissolved aluminium, turbidity, pH	Performance tracking No compliance limits. Subject to 6-yearly review.			
			Performance	Weekly (basic suite plus)	EC, Dissolved Iron Ammoniacal-N, Nitrate-N				
			Performance LDS discharge	Continuous - during LDS discharge event	Turbidity, EC, pH				
			Compliance	Daily weekday	pH	> 4	-	< 7 (95th)	> 4 & < 7 (15 samples)
	Mangatini Stream **S14C**	**RC10103** Ammonia Nitrogen < 20 mg/L (monthly sampling) Nitrate Nitrogen < 10 mg/L (monthly sampling) Nitrite Nitrogen < 1 mg/L (monthly sampling) **RC07011** Thallium < 0.04 mg/L (monthly sampling)	-	-	-	-			
	Mangatini Stream **MGD**	-	Performance	Weekly (basic suite plus)	Dissolved aluminium	Performance tracking No compliance limits. Subject to 6-yearly review.			
	Mangatini Trib **MT6**	-	Reference	Monthly (comprehensive suite)	Dissolved aluminium and iron, pH, EC, Ammoniacal-N, Nitrate-N, turbidity	Performance tracking No compliance limits. Subject to 6-yearly review.			
	Sandy Creek (S1 Stream) **S1**	**Consent: RC89038** pH < 3.7 minimum baseline (monthly sampling) Total suspended solids < 6 mg/L baseline (monthly sampling) Turbidity < 12 NTU baseline (monthly sampling) Temperature < 21.8°C baseline (monthly sampling)	Reference	Monthly (comprehensive suite)	Dissolved aluminium and iron, pH, EC, Ammoniacal-N, Nitrate-N, turbidity	Performance tracking No compliance limits. Subject to 6-yearly review.			
Millerton Block	Granity Stream **S25**	**Consent: RC09028** Turbidity < 25 NTU (Daily samples, 30 day rolling median) Thallium < 0.04 mg/L (monthly sampling) **Consent: RC11138** Daily pH sampling required when discharging from shellfish leach beds, also CBOD and Total Ammonia.	Performance	Monthly (basic suite plus)	Dissolved aluminium and iron, pH, EC, Ammoniacal-N, Nitrate-N	Performance tracking No compliance limits. Subject to 6-yearly review.			
			Compliance	Daily weekday	Turbidity (NTU)	-	-	-	< 25 (15 samples)
	Miller Stream **S24a**	**Consent: RC09028** Turbidity < 25 NTU (30 day rolling median) Thallium < 0.04 mg/L (monthly) **Consent: RC11138** Daily pH sampling required when discharging from shellfish leach beds, also CBOD and Total Ammonia.	Performance	Monthly (basic suite plus)	Dissolved aluminium and iron, pH, EC, Ammoniacal-N, Nitrate-N	Performance tracking No compliance limits. Subject to 6-yearly review.			
			Compliance	Daily weekday	Turbidity (NTU)	-	-	-	< 25 (15 samples)
	Mine Creek **MC1**	-	Performance	Weekly (basic suite plus)	Dissolved aluminium, iron, pH, EC	Performance tracking. No compliance limits. Subject to 6-yearly review.			
			Performance	Monthly (basic suite plus)	Ammoniacal-N, Nitrate-N				
			Compliance	Daily weekday	Turbidity (NTU)	-	-	-	< 25 (15 samples)
	Mine Creek Northern tributary	**Consent: RC09028**	-	-	-	-			

Catchment	Site details (Reference sites highlighted in blue)	Current (none if blank)	BPCP proposed (none if blank) from Instream (2026)						
		Consent compliance limits	Reporting type (reference sites shaded blue)	Sampling regime	Reporting analytes	Annual 5TH percentile	Rolling annual median	Annual upper percentile	Rolling median
	S6	Turbidity < 25 NTU (30-day rolling median) **Consent: RC10103** Nitrate nitrogen < 10 mg/L (monthly sampling) Nitrite nitrogen < 1 mg/L (monthly sampling) **Consent: RC07011** Thallium < 0.04 mg/L (monthly sampling) **Consent: RC11138** RC11138 sampling required when discharge from shellfish leach bed, also includes CBOD and Total Ammonia.							
	Mine Creek Northern tributary **S23**	**Consent: RC09028** Turbidity < 25 NTU (30-day rolling median) Consent: RC89038 - V6 Acidity < 285 mg/L (Monthly mean (based on weekly samples) Total suspended sediment < 30 mg/L (Monthly mean (based on weekly samples)	-	-	-	-			
	Rudolph Stream **S28U** Rollover from RC89038	**Consent: RC89038 - V6** Acidity < 285 mg/L (Monthly mean (based on weekly samples) Total suspended solids < 30 mg/L (Monthly mean (based on weekly samples)	Compliance	Weekly	Dissolved aluminium (mg/L)	-	30	-	-
					Turbidity (NTU)	-	-	-	< 25 (15 samples)
		-	Performance	Weekly (basic suite plus)	pH, EC, dissolved iron, Ammoniacal-N, Nitrate-N	Performance tracking. No compliance limits. Subject to 6-yearly review.			
	Twins Stream **T1**	-	Compliance	Weekly	Dissolved aluminium (mg/L)	-	< 28	-	-
					Turbidity (NTU)	-	-	-	< 25 (15 samples)
			Performance	Weekly (basic suite plus)	EC, pH, Dissolved Iron, Ammoniacal-N, Nitrate-N	Performance tracking No compliance limits. Subject to 6-yearly review.			
	Granity Stream **GT1**	-	Reference	Monthly (comprehensive suite)	Dissolved aluminium and iron, pH, EC, Ammoniacal-N, Nitrate-N, turbidity	Performance tracking No compliance limits. Subject to 6-yearly review.			
St Patrick	St Patrick Stream **S16**	**Consent: RC10256 – V5** Acidity 7.0: 90 day rolling median < 80 mgCaCo3/L (daily sampling) Acidity 7.0: 99%ille daily samples for one yr. < 140 mgCaCo3/L. (daily sampling) Total suspended solids: 30 day rolling median < 25 mg/L (daily sampling) Total suspended solids: 90 day 90th percentile 75mg/L (daily sampling) Dissolved aluminium: 90 day rolling median < 10 mg/L (daily sampling) Dissolved aluminium: 99%ille daily samples for one yr < 16 mg/L (daily sampling) Nitrate-nitrogen < 10 mg/L (monthly sampling) **Consent: RC10103** Nitrate-nitrogen < 10 mg/L (monthly sampling)	Compliance	Daily weekday	Dissolved aluminium (mg/L)	-	< 5	< 8 (95th)	< 8 (15 samples)
					pH	> 3.4	-	< 7 (95th)	> 3.4 & < 7 (15 samples)
					Turbidity (NTU)	-	< 6.9	< 44 (95th)	< 24 (15-samples)

Catchment	Site details (Reference sites highlighted in blue)	Current (none if blank)	BPCP proposed (none if blank) from Instream (2026)						
		Consent compliance limits	Reporting type (reference sites shaded blue)	Sampling regime	Reporting analytes	Annual 5TH percentile	Rolling annual median	Annual upper percentile	Rolling median
		Nitrite-nitrogen < 1 mg/L (monthly sampling) **Consent: RC07011** Thallium < 0.04 mg/L (monthly sampling)							
		-	Performance	Weekly (basic suite plus)	EC, Dissolved Iron, Ammoniacal N, Nitrate N	Performance tracking No compliance limits. Subject to 6-yearly review.			
	Un-Named Stream **S3**	**Consent: RC89038 - V6** pH > 2.8 Baseline* value (monthly sampling) Total suspended solids < 11.3 mg/L Baseline* value (monthly sampling) Turbidity < 97 NTU Baseline* value (monthly sampling) Temperature < 21.5◦C Baseline value* (monthly sampling) **Water Right: WR 89/38** Baseline values							
	T35 Stream **T35 Trib**	-	Reference	Monthly (comprehensive suite)	Dissolved aluminium and iron, pH, EC, Ammoniacal-N, Nitrate-N, turbidity	Performance tracking No compliance limits. Subject to 6-yearly review.			
Upper Waimangaroa	Whirlwind Stream **S4**	**Consent: RC89038 - V6** pH > 3.8 baseline (monthly sampling) Turbidity < 500 NTU baseline (monthly sampling) Temperature < 14.4oC baseline (monthly sampling) **Consents: RC11138 and RC10103** Ammonia nitrogen < 20 mg/L (RC11138 – Discharge from shellfish leach bed. *Baseline value from WR 89/38) **Consent: RC10103** Nitrate nitrogen < 10 mg/L (monthly sampling) Nitrite nitrogen < 1 mg/L (monthly sampling)	Performance	Monthly (basic suite plus)	Dissolved aluminium, Dissolved Iron pH, EC, Ammoniacal-N, Nitrate-N, turbidity	Performance tracking. No compliance limits. Subject to 6-yearly review.			
	Herbert Stream **UC2**	-	Performance	Monthly (basic suite plus)	Dissolved aluminium, Dissolved Iron, pH, EC, Ammoniacal-N, Nitrate-N, turbidity	Performance tracking. No compliance limits. Subject to 6-yearly review.			

7.1.2 Sediment quality

Table 7.4 summarises the proposed sediment quality sampling regime for the Ngākawau River. Sediment quality monitoring is proposed at site NR to measure the effects of AMD on aquatic ecology in water quality recovered sites relative to a reference site. The regime includes Reference and Recovered sites to enable spatial comparison of sediment quality, with sampling focused on fine and coarse sediment fractions and comparison against relevant ANZG (2018) guideline values. The results will be used for context and performance reporting to track long-term trends (Instream, 2026).

To inform the relative influence of each source on the lower river, in particular the potential downstream effects of the LDS high-flow discharges to the Mangatini Stream, it is recommended that a routine investigation is undertaken to attribute sediment metals to a source.

Sediment metal source sampling should be contextualised with suitable reference sites (e.g. the Ngākawau River upstream of Mangatini and upstream of St Patrick Stream). A sediment metal source attribution study should occur every six years or in the event of a major re-configuration of water management and be reported in the Mangatini Sump management plan update at that periodicity, designed to assess (Instream, 2026).

Table 7.4 Proposed sediment quality sampling regime (Instream, 2026)

Site details	Water quality status	Reporting type	Sampling regime	Focus	Reporting thresholds
Ngākawau River upstream of St. Patrick confluence	Reference	Reference	Every 3 years – 2 samples true right bank (TRB) and true left bank (TLB)	Sediment Quality - Total recoverable Co, Cu, Fe, Mn, Zn, Al, Sb, Cr, Ni, Ag, Sn, As, Cd, Pb, Hg, Tl from <2mm and <63µm size fractions. Grain size distribution.	Comparison to ANZG (2018) DGV and GV-high. Performance reporting only.
Ngākawau River NR	Recovered	Performance	Every 3 years – 2 samples TRB and TLB		
TRB = True Righ Bank, TLB = True Left Bank					

7.1.3 Flow rate

Flow rate monitoring occurs on all the major waterways draining the Stockton Plateau. Under the BPCP, operational flow monitoring is proposed via a suite of surface water monitoring sites all the major catchments (Bathurst, 2026h).

Operational flow monitoring is undertaken as part of the broader real-time water quality and flow monitoring network, using continuous telemetered sensors linked to preset trigger and alarm thresholds. Flow data are used to support operational water management decision-making and to identify elevated flow conditions that may increase the risk of uncontrolled discharges or exceedance of internal environmental triggers.

Apart from flow conditions at Mangatini Stream site S14B related to the Mangatini Sump LDS discharge (Table 7.3), no flow consent compliance limits are being sought under the BPCP. The outcomes of the hydrology assessment (MWM, 2026) did not result in recommendations of flow limits and indicated that changes in flow (various increases and decreases in different locations and at different times) are likely not an issue for aquatic ecosystems nor for downstream water users.

7.1.4 Aquatic ecosystems

Future aquatic ecosystem (ecological) monitoring is proposed on 27 waterways sites. The site locations, sampling regime, focus and reporting thresholds are detailed by Instream (2026). The monitoring includes a range of compliance, performance and Reference sites and can include macroinvertebrates, fish, periphyton, bryophytes and habitat. Ecology assessments are proposed to occur on a six yearly basis at water quality Impacted and Recovering sites, but on a 3-year rotation at water quality Recovered sites, such as NR on the Ngākawau River as per the monitoring format described in Instream (2026).

7.1.5 Human health - Mahinga Kai

After streams become 'ecologically recovered,' selected biota will be analysed for the bioaccumulation of contaminants in tissues (as a proxy measure), to inform suitability for mahinga kai through a comparison to reference levels and food safety standards. [redacted].

7.2 Groundwater

Groundwater monitoring will be undertaken as part of the BPCP to understand the (quality and quantity) impacts on groundwater and hydraulically connected surface water. The proposed groundwater monitoring framework is outlined in Table 7.5. Further information is provided in the Stockton hydrogeology report prepared for this application (GHD, 2026).

Table 7.5 Proposed groundwater monitoring framework

Catchment	Proposed groundwater monitoring	Reporting type
Millerton Block	1. Water quality monitoring at groundwater fed Twins Stream T1 compliance monitoring site – see Table 7.3.	Compliance
	1. Continued monitoring of water levels and potentially quality in historical underground workings downgradient of the proposed water treatment sumps. 2. Continued monitoring of the flow and quality of water discharging from the DCA portal historical underground workings. 3. Installation of bores to monitor groundwater levels and quality within the BCM and granite to assess potential impacts from AMD produced from waste rock in the Millerton ELF, seepage from MW16 Sump (main treatment sump), and seepage from the leftover pit shells coal floor.	Reference
Mangatini	1. Existing bore STK7163 used to monitor groundwater impacts down-gradient of the proposed Webb ELF (used for disposal of Cypress PAF waste rock). This bore has been installed as part of Cypress consent RC03175, which requires that a sampling and monitoring programme be established. Additional monitoring downgradient of the Webb ELF using. paired monitoring bores; one to target the BCM and one to target Basement.	Compliance
	1. Continued monitoring of water levels and quality in the existing bores located adjacent to and downgradient of Mangatini Sump to understand any seepage losses. 2. Installation of new bore(s) to monitor groundwater levels and quality within the BCM downgradient of the existing A18 CFSF. 3. Continued CFSF pore water, seepage quality and levels measured in VWPS.	Reference
St Patrick	1. Installation of new bores to monitor groundwater levels and quality within the BCM downgradient of the existing McCabes CFSF and the three additional proposed CFSFs at A-Drive. 2. Continued CFSF pore water, seepage quality and levels measured in VWPS. 3. Surface water monitoring site S16 is located.	Reference
Upper Waimangaroa	1. Groundwater impacts on waterways to be monitored in the Upper Waimangaroa River at monitoring site 6W.	Reference

The monitoring focuses on AMD impacts from the Brunner Coal Measures (main acid forming material at Stockton) at / or near key discharges into key waterways from seepages and historic underground workings and downgradient of potential AMD contaminant sources such as ELF waste rock areas, coal fines storage facility (CFSFs), water treatment sumps and pit floor run-off sites.

Groundwater quality sampling field parameters (pH, temperature, electrical conductivity, oxidation reduction potential, dissolved oxygen) and laboratory analyses (pH, EC, DOC, TSS, turbidity, alkalinity, acidity (to pH 8.3), HCO3, Cl, SO4, NO3-N, TN, and dissolved concentrations of Ca, Mg, K, Na, Al, Ar, Ca, Ch, Cu, Fe, Mn, Ni, Se, Zn). The proposed sampling frequency is quarterly with a full major ion's suites sampled annually.

Groundwater levels in each of the monitoring bores would be taken manually prior to sampling and automatically (using loggers) from selected bores.

Details of the groundwater monitoring will be confirmed as a condition of the granting of the BPCP.

7.3 Sludge management

Resource consent RC06206 allows the controlled discharge of low-density solids (LDS) from the Manatini Sump to the Mangatini Stream in high rainfall conditions, as detailed in the Mangatini Sump Management Plan (GHD, 2018). The 2018 variation to consent RC06206, requires an update every 2 years on the management plan implementation. These updates have been provided as memos to WCRC for the years 2020, 2023 and 2024 (GHD 2020, 2023 and 2024 respectively).

The 2023 variation to consent RC06206 (consent RC06206 v8) as documented in the 2024 Mangatini Sump Management Plan memo changed the monitoring site. The Ngākawau River monitoring site NR was destroyed in 2021 and replaced permanently by site NR2 (GHD, 2024). NR2 is problematic for flow recording as it is located within the tidal influence zone, and thus the Mangatini Stream S14B monitoring site was selected to be the representative flow monitoring site, while turbidity continues to be measured at NR2.

It is proposed that the conditions in consent RC06206 are rolled over into the new consent being sought. Discharge of LDS to the Mangatini Stream, and ultimately the Ngākawau River and estuary, is infrequent, occurring only when flow is at or above a 70th percentile when there is considerable dilution in the receiving environment (Bathurst, 2025b). Mangatini Sump bypass events nominally occur 30% of the time (i.e., flows > 70th percentile), with only 22% of those bypass events lasting longer than 24 hours (Bathurst, 2025b).

Discharge of LDS does not impact pH and is likely to be contributing alkalinity to the receiving waters, however, LDS discharge does have the potential to impact turbidity and clarity (GHD, 2018). The existing consent conditions apply specific limits to turbidity while LDS discharge is occurring, to ensure turbidity in the Ngākawau River is maintained at naturally occurring levels (GHD, 2018). An assessment of the total sediment loads discharged from Stockton mine was undertaken with data from 2020 to give context to the potential effects of LDS bypass and decant discharge. Estimates indicate that Mangatini Sump LDS discharges contribute to only 6.9% of the sediment load per year at NR (Bathurst, 2025b).

Transfer of excess waste rock from the Cypress operation to Webb South (WE07), an open cast pit within the Mangatini Catchment, is the main mining activity anticipated post 2027. This activity is currently authorised by resource consent RC03175/17. The volume of the excess rock (NAF and PAF) is estimated at a total of ~3.6 Mlcm (Bathurst, 2026b). This activity is expected to potentially contribute to an additional ~2% increase of sludge in Mangatini Sump to be treated. However, the Mangatini Sump treatment process is planned to transition from calcium oxide to magnesium oxide by 2032. This change is expected to reduce sludge volumes by approximately one order of magnitude, further reducing the volume of LDS discharged to the Mangatini Stream, and in turn reducing any potential effects the revieing environment.

Going forward, to assess any adverse impact from LDS accumulating in sediments, Instream (2026) has recommended that a metals sediment survey is undertaken every year at site NR2 to determine if there are any trends in metal concentrations as part of the 5-year reviews. This assessment and proposed monitoring is described in Instream (2026) Stockton Plateau Aquatic Ecology report (2026) and is summarised in Table 7.4 of Section 7.1.1 of this report.

7.4 Cultural impact

Preservation of key cultural values in relation to the BPCP is established through the recommendations outlined the Cultural Impact Assessment (2026), prepared for Bathurst by Te Rūnanga o Ngāti Waewae. A summary of the key recommendations is as follows, while full descriptions of the impacts and proposed actions are outlined in the assessment document:

1. Engagement and governance
   - Establish a strong working relationship between Ngāti Waewae and Bathurst to address cultural impacts.
   - Include Ngāti Waewae in management agreements, advisory groups, and decision-making processes.
   - Involve Ngāti Waewae in species relocation decisions and ensure long-term protection of cultural values beyond Bathurst's presence in the area.
2. Water and ecosystem monitoring
   - Provide annual water and ecosystem monitoring reports to Ngāti Waewae for review and comment.
   - Develop a cultural health index for waterways in collaboration with Ngāti Waewae.
   - Include groundwater monitoring and reporting in annual data shared with regulators and iwi.
   - Ensure monitoring reports assess improvements in the mauri (life force) of waterways
3. Rehabilitation and biodiversity
   - Collaborate with Ngāti Waewae on rehabilitation techniques, incorporating mātauranga Māori (Māori knowledge).
   - Share research findings on koura movement and culvert designs with Ngāti Waewae.
   - Involvement with compensation package.
   - Prevent the establishment of weeds and pests during rehabilitation.
   - Use indigenous species for rehabilitation, preferably those native to the area.
   - Keep Ngāti Waewae informed of all rehabilitation activities and outcomes and invite representatives to annual site visits.
4. Conservation and cultural commitments
   - Exclude Mt William from the project and commit to no further exploration on this maunga.
   - Incorporate mātauranga Māori into monitoring and reporting procedures over time.
   - Involve Ngāti Waewae in the governance and delivery of the compensation package.
   - Opportunities for Ngāti Waewae whanau to participate in implementing compensation outcomes and integrating mātauranga Māori.

7.5 Recommendations

Recommendations for future work and consenting are listed below:

- Preparation of a McCabes Sump Management Plan, in the same vein as the Mangatini Sump Management Plan.
- Aligning future consent expiry times and monitoring for compliance where possible for the life of the BPCP.
- Review periods every 5 -10 years to reassess and adjust consent conditions and monitoring as necessary.
- New consents being applied for under the proposed BPCP are aligned to the current low-density sludge (RC06206) and mussel shell reactor (RC11138) consents where appropriate.
- Review and update the current groundwater monitoring with a focus on impacts to waterways that receive groundwater discharges.

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Appendices

Appendix A

Surface water monitoring

A-1 Current surface water flow, quality and compliance monitoring sites

Table A.1 Stockton surface monitoring sites (source: MWM, 2025, MWM, 2026 and Bathurst)

Catchment	Site ID	Location description	Flow consent compliance limits	Flow monitoring sites	Water quality consent compliance limits	Water quality sites and monitoring frequency*
Ngākawau	NR	Ngākawau River upstream of Mine Creek confluence (post treatment). NR has been replaced by NRB.	-	y	y	Daily
	NRB	Ngākawau River Bridge - downstream of Mine Creek confluence and Ngākawau complex discharges (S32B), sampled on an outgoing tide	-	-	-	Monthly
	S32B	Ngākawau complex outlet / discharge	-	y	y	Daily
Mangatini	4WP2	4WP2 drain off Collis Road before MG Quarry	-	-	-	Daily
	MG15	MG15 off Collis Road	-	-	-	2 x week
	MGIU	Mangatini Sump inlet (untreated)	-	-	-	Daily
	MGIT	MGIT treated limestone added	-	-	-	Daily
	MGITT	Mangatini Inlet Top Telemetry	-	-	-	Daily
	MST	Manchester St Drain at Mangatini Sump entrance	-	-	-	2 x week
	MGD	Mangatini Decant - Autosampler	-	y	-	Daily
	DSW	Duncans Sump-Access down Camilo Road - At barrier	-	-	-	Weekly
	S14C	Mangatini Stream at 2-5 (post treatment)	-	y	y	Daily
	S14B	Mangatini Stream mid - Autosampler	-	y	y	Daily
	S1	Weka Creek - Tin Town, Natural state site	-	-	y	Monthly
	Sandy Creek	Sandy Creek - upstream of 2 -5 Haul Road at Tin Town corner	-	-	-	Weekly
	FC2	Ford Creek	-	y	-	Weekly
	FC3	Ford Creek opposite Campbells waste rock area	-	-	-	Weekly
	MT6	Mangatini Stream tributary – Reference site	-	-	-	-
Millerton Block	DCA	Millerton Adit	-	y	-	Monthly
	MPP	Millerton Fire Suppression -Loop Road at a pipe valve	-	-	-	Weekly
	S6	Mine Creek - northern tribute	-	y	y	Daily
	S23	Mine Creek - southern tributary	-	y	y	Daily
	MC1	Mine Creek - Ngākawau River confluence	-	y	-	-
	MC2	No5 discharge to Mine Creek	y	-	-	Monthly

Catchment	Site ID	Location description	Flow consent compliance limits	Flow monitoring sites	Water quality consent compliance limits	Water quality sites and monitoring frequency*
	S28U South	Upper Rudolph Stream south tributary	-	-	-	Weekly
	S28U	Upper Rudolph Stream	-	-	y	Weekly
	RNS	Rockies north drain sump	-	-	-	Weekly
	T23	Twins Stream - Rodney Road, Millerton township	-	-	-	6 Monthly
	T22	Twins Stream - Rodney Road, Millerton township	-	-	-	Monthly
	T21	Twins Stream - Rodney Road, Millerton township	-	-	-	Monthly
	T1	Twins Stream	-	-	-	-
	T2	Twins Stream	-	-	-	-
	T3	Twins Stream	-	-	-	-
	GT1	Granity Stream tributary - Rodney Road, Millerton township	-	-	-	Monthly
	S24A	Miller Stream - Millerton township	-	y	y	Daily
	S25	Granity Stream - Millerton township	-	y	y	Daily
	GS5	Granity Stream at highway bridge	-	-	-	Weekly
St Patrick	S3	Unnamed stream on north of 2-5 at corner of Manchester St	-	-	y	Monthly
	PLAOFM	Lower Plover Stream	-	y	-	Weekly
	Fly 5	Mid Fly Creek	-	y	-	Weekly
	Sump D	Concrete structure	-	y	-	Daily
	S16	St Patrick Stream	-	y	y	Daily
	T31	T31 Stream - Fly Creek Road	-	y	-	Monthly
	N1S	No 1 North Dam-Near decant - northern end	-	-	-	Weekly
Upper Waimangaroa	UC2	Herbert Stream	-	-	-	Monthly
	S4	Whirlwind Stream (post treatment)	-	-	y	Monthly
	MFQ	Mt Fred Quarry - above confluence with input from Mt Fred Sidecast.	-	-	-	Monthly

Daily samples are collected on weekdays only

** Monitoring frequency is based on operational sampling frequency, not the proposed sampling frequency for compliance purposes.*

Appendix B

Recent resource consent compliance

B-1 Compliance to water quality and flow consent limits at waterway and run-off sites from 2017 - 2024

B-1-1 Ngākawau River

Ngākawau River						
Receiving waterway or Run-off from mining areas	Site ID	Location description	Consent compliance limits	Consent compliance and comments (2017 – 2024)		
				Comply - Fully	Comply – At Risk	Low Risk Non-Compliance
Receiving waterway	NR	Ngākawau River (post treatment)	Consent: RC06206 v8 *pH > 4.0 based on a 30-day rolling median (daily weekday sampling)* *Hardness < 500 mg/L: Monthly samples pH <7.5, daily pH >7.5, 4 day rolling mean* *Turbidity < 25 NTU based on a 30-day rolling median (daily weekday sampling)* *Aluminium: 99% of samples below community value of 1 mg/L (daily weekday sampling).* Consent: RC07011 *Thallium < 0.04 mg/L (monthly sampling)*	Low Risk Non-Compliance *pH data are compliant since at least 1 January 2017 (MWM, 2025).* *1% of time for daily aluminium (MWM, 2025).* *99% of samples below Community Value (MWM, 2025).* *No instances of turbidity limit exceedance since 2014 (MWM, 2025).* Annual Ngākawau fish survey was undertaken by freshwater ecologist Dr Duncan Gray in December 2017 and a similar fish survey was undertaken in November 2018, December 2019 and December 2021. The results of these surveys have been forwarded to WCRC. There was no particular change in the species of fish observed in 2021 relative to previous 5 years (Bathurst, 2023). The December 2023 results indicate that the koaro population of the upper river remains significantly more abundant than recorded in 2005 (Bathurst, 2024). There was no particular change in the species of fish observed in December 2023 relative to previous 5 years. Macroinvertebrate ecology survey similar to previous years (Bathurst, 2024).		
Run-off - Cleanwater	S32B	Ngākawau complex outlet	*Consent: RC01104* *Daily sampling (weekday only)* *pH > 4.0 based on a 30-day rolling median.* *TSS:* • *10 sample rolling median < 50 mg/L* • *92%ile (11/12 annual samples) < 150 mg/L* *Turbidity:* • *10 sample rolling median < 75 NTU* • *92%ille (11/12 annual samples) < 250 NTU* • *Mean telemetry samples < 120 NTU*	Low Risk Non-Compliance *pH shows four instances less than lower compliance limit since 1 January 2017. Data also show mean increase over time (pre 2017 mean pH of 6.4, recent 12-month period mean pH of 7.2) (MWM, 2025).* Compliance in all cases bar the 10-sample rolling median TSS, which slightly exceed the 50 mg/L limit early in the 2021/22 reporting year. The calculation up until October 2021 includes the high TSS value of on 28/01/2022 (relating to a burst pump at the polishing pond). Sample deliberately (and therefore conservatively) included in the monthly data for 2020/21 and makes its way into the 10-sample rolling median up until October 2021. Incident immediately notified; long-term corrective actions put in place (upgraded water treatment facility). Detailed in 2020/2021 Annual Compliance report (Bathurst, 2022). No evidence of, or sightings of the stipulated adverse effects during the reporting period (Bathurst, 2023). Non-compliance at S32B for pH. All other sites comply.		

Ngākawau River						
Receiving waterway or Run-off from mining areas	Site ID	Location description	Consent compliance limits	Consent compliance and comments (2017 – 2024)		
				Comply - Fully	Comply – At Risk	Low Risk Non-Compliance
			• *Telemetry samples 95%ile < 300 NTU*	No evidence of, or sightings of any of the stipulated adverse effects occurring during the reporting period (Bathurst, 2024). Whitebait at the discharge point by the Bathurst Water Sampler (Bathurst, 2024).		

B-1-2 Mangatini catchment

Mangatini catchment						
Receiving waterway or Run-off from mining areas	Site ID	Location description	Consent compliance limits	Consent compliance and comments (2017 – 2024)		
				Comply - Fully	Comply – At Risk	Low Risk Non-Compliance
Receiving waterway	S14C	Mangatini Stream at 2-5 (post treatment)	Consent: RC10103 *Ammonia Nitrogen < 20 mg/L (monthly sampling)* *Nitrate Nitrogen < 10 mg/L (monthly sampling)* *Nitrite Nitrogen < 1 mg/L (monthly sampling)* Consent: RC07011 *Thallium < 0.04 mg/L (monthly sampling)*	Comply – Fully *Total nitrogen, ammonia nitrogen, nitrate, and nitrite values are all below compliance values (MWM, 2025).* *Thallium consistently well under compliance limits (MWM, 2025).*		
Receiving waterway	S14B	Mangatini Stream Mid	Consent: RC06206-V8 *pH < 4*	Comply – Fully *No incidence of 30 day rolling median values < 4 since 2017 (MWM, 2025).*		
Receiving waterway	S1	Sandy Creek - Tin Town, Natural state site	Consent: RC89038 *pH > 3.7 minimum baseline (monthly sampling)* *TSS < 6 mg/L baseline (monthly sampling)* *Turbidity < 12 NTU baseline (monthly sampling)*	Low Risk Non-Compliance *Five instances of baseline exceedance of TSS and two of turbidity since 1 January 2017 (MWM, 2025).* *Temperature baseline values have only been exceeded once in 1993 (MWM, 2025).*		

Mangatini catchment						
Receiving waterway or Run-off from mining areas	Site ID	Location description	Consent compliance limits	Consent compliance and comments (2017 – 2024)		
				Comply - Fully	Comply – At Risk	Low Risk Non-Compliance
			Temperature < 21.8°C baseline (monthly sampling)			

B-1-3 Millerton Block

Millerton block						
Receiving waterway or Run-off from mining areas	Site ID	Location description	Consent compliance limits	Consent compliance and comments		
				Comply - Fully	Comply – At Risk	Low Risk Non-Compliance
Receiving waterway	S6	Mine Creek - northern tribute	Consent: RC09028 *Turbidity < 25 NTU (30-day rolling median)* Consent: RC10103 *Nitrate nitrogen < 10 mg/L (monthly sampling)* *Nitrite nitrogen < 1 mg/L (monthly sampling)* Consent: RC07011 *Thallium < 0.04 mg/L (monthly sampling)* Consent: RC11138 *RC11138 sampling required when discharge from shellfish leach bed, also includes CBOD and Total Ammonia.*	Comply – Fully *Thallium has remained consistently below compliance limits (MWM, 2025).* *Total nitrogen, nitrate-, nitrite-and ammoniacal- nitrogen are consistently below compliance limits (MWM, 2025).*		
Receiving waterway	S23	Mine Creek - southern tributary	Consent: RC09028 *Turbidity < 25 NTU (30-day rolling median)*	Comply – Fully *Turbidity is consistently below the compliance limit (MWM, 2025)*		

Millerton block						
Receiving waterway or Run-off from mining areas	Site ID	Location description	Consent compliance limits	Consent compliance and comments		
				Comply - Fully	Comply – At Risk	Low Risk Non-Compliance
Receiving waterway	S28U	Upper Rudolph Stream	Consent: RC89038 - V6 *Acidity < 285 mg/L (Monthly mean (based on weekly samples)* *TSS < 30 mg/L (Monthly mean (based on weekly samples))*	Comply – Fully *Mean acidity has remained relatively unchanged from and consistently below compliance conditions (MWM, 2025).* *Mean TSS has remained below compliance limits since 2016 (MWM, 2025).*		
Receiving waterway	S25	Granity Stream - Millerton township	Consent: RC09028 *Turbidity < 25 NTU (Daily samples, 30 day rolling median)* *Thallium < 0.04 mg/L (monthly sampling)* Consent: RC11138 *Daily pH sampling required when discharging from shellfish leach beds, also CBOD and Total Ammonia.*	Comply – Fully *Mean turbidity has remained consistently below compliance limits (MWM, 2025).* *Thallium data has remained consistently below compliance limits (MWM, 2025).*		
Receiving waterway	S24A	Miller Stream - Millerton township	Consent: RC09028 *Turbidity < 25 NTU (30 day rolling median)* *Thallium < 0.04 mg/L (monthly)* Consent: RC11138 *Daily pH sampling required when discharging from shellfish leach beds, also CBOD and Total Ammonia.*	Comply – Fully *Mean turbidity has remained consistently below compliance limits (MWM, 2025)* *Thallium data has remained consistently below compliance limits (MWM, 2025).*		
Run-off xx	MC2	No5 discharge to Mine Creek	Consent: RC07179 *Flow rate ≤ 5 L/s*	Comply – Fully *Flow is not sampled monthly as per consent conditions, though flow has never exceeded consent conditions since recording commenced in September 2008 (MWM, 2025).*		

B-1-4 St Patrick catchment

St Patrick catchment						
Receiving waterway or Run-off from mining areas	Site ID	Location description	Consent compliance limits	Consent compliance and comments		
				Comply - Fully	Comply – At Risk	Low Risk Non-Compliance
Receiving waterway	S3	Unnamed stream on north of 2-5 at corner of Manchester St. Ford Creek Tributary	Consent: RC89038 - V6 *pH > 2.8 Baseline* value (monthly sampling)* *TSS < 11.3 mg/L Baseline* value (monthly sampling)* *Turbidity < 97 NTU Baseline* value (monthly sampling)* *Temp < 21.5°C Baseline value* (monthly sampling)* *Baseline values from WR 89/38*	Low Risk Non-Compliance *No pH data below baseline limits since 1989 (MWM, 2025).* *Two instances of exceedance of baseline values for TSS since 2017 (MWM, 2025).* *No exceedance of temperature baseline value (MWM, 2025).*		
Receiving waterway	S16	St Patrick Stream	Consent: RC10256 – V5 *Acidity 7.0: 90 day rolling median < 80 mgCaCo3/L (daily sampling)* *Acidity 7.0: 99%ille daily samples for one yr. < 140 mgCaCo3/L. (daily sampling)* *TSS: 30 day rolling median < 25 mg/L (daily sampling)* *TSS: 90 day 90th percentile 75mg/L (daily sampling)* *Aluminium: 90 day rolling median < 10 mg/L (daily sampling)* *Aluminium: 99%ille daily samples for one yr < 16 mg/L (daily sampling)* *Nitrate-nitrogen < 10 mg/L (monthly sampling)* Consent: RC10103 *Nitrate-nitrogen < 10 mg/L (monthly sampling)*	Low Risk Non-Compliance *Acidity has remained below compliance limits since 2020 (MWM, 2025), but exceedances in 2013, 2014 and 2018.* *TSS has remained consistently below compliance limits since 2013.* *Mean aluminium concentrations have remained below the 90 day compliance limits since 2014. Within the 12-month period July 2023 to June 2024, the 99 percentile value of aluminium was 9.0 mg/L, well within the compliance limit of 16 mg/L (MWM, 2025).* *Nitrite and nitrate samples are consistently below compliance limits (MWM, 202a).* *Thallium has remained consistently below compliance limits (MWM, 2025).*		

St Patrick catchment						
Receiving waterway or Run-off from mining areas	Site ID	Location description	Consent compliance limits	Consent compliance and comments		
				Comply - Fully	Comply – At Risk	Low Risk Non-Compliance
			Nitrite-nitrogen < 1 mg/L (monthly sampling) Consent: RC07011 *Thallium < 0.04 mg/L (monthly sampling)*			

B-1-5 Upper Waimangaroa catchment

Waimangaroa catchment (areas of surface water drainage from Stockton only)						
Receiving waterway or Run-off from mining areas	Site ID	Location description	Consent compliance limits	Consent compliance and comments from annual compliance reports (2017 – 2024)		
				Comply - Fully	Comply – At Risk	Low Risk Non-Compliance
Receiving waterway	S4	Whirlwind Stream	Consent: RC89038 - V6 *pH > 3.8 baseline (monthly sampling)* *Turbidity < 500 NTU baseline (monthly sampling)* *Temperature < 14.4°C baseline (monthly sampling)* Consents: RC11138 and RC10103 *Ammonia nitrogen < 20 mg/L (RC11138 – Discharge from shellfish leach bed. *Baseline value from WR 89/38)* Consent: RC10103 *Nitrate nitrogen < 10 mg/L (monthly sampling)* *Nitrite nitrogen < 1 mg/L (monthly sampling)*	Low Risk Non-Compliance *Several instances of pH being < baseline pH (MWM, 2025) pre and post 2017.* *No instances of turbidity baseline exceedance since 1995 (MWM, 2025).* *Nitrite-nitrogen, nitrate-nitrogen, and ammoniacal-nitrogen data is consistently below compliance limits (MWM, 2025).* *Temperature, 34 instances exceeding baseline value, all between the months of October to March (MWM, 2025)*		

B-2 Annual compliance monitoring for water related consents from 2021/22 – 2023/24

Consent compliance grading	Examples
Comply – Full	Complying with all consent conditions.
Comply – At Risk	At Risk grading identified against key condition(s) of one or more consents for the site.
Low Risk Non-Compliance	Compliance with most of the relevant consent conditions. Non-compliance carries a very low risk of adverse environmental impacts or is technical in nature.
Not Assessed	Consent monitoring has not been undertaken during the reporting period.

Resource consent	Activity description	Annual compliance review of conditions reported against			Comments
		Comply – Full / Comply – At Risk / Low Risk Non-Compliance / Not Assessed			
		2021/22 (Bathurst, 2022)	2022/23 (Bathurst, 2023)	2023/24 (Bathurst, 2024)	
RC08126	Coal processing and associated activities water take from Plover Stream, Fly Creek and Mangatini Stream catchments.				At times water is pumped at high rates to clear sediment build-up and supply the CHPP sufficient water. This explains the occasional pumped flow > 50 L/s (5% of the time, for the 2023 reporting year). However, as the water is pumped from a large body of water (No1 North dam) **the impact of these infrequent high abstraction rates is inconsequential - in terms of affecting flows in Plover Stream**. The average water take rate from No.1 North dam for the reporting year was 22.8 L/s (Bathurst, 2023).
RC05145	Take and Discharge water in relation to drilling.				-
RC07007	Duncan's sump water permits and discharge permit.				-
RC07229	Mangatini sump land use consents, water permits and discharge permits.				-
RC10256	McCabes mining area water permits and discharge permits.				No sediment non-compliances recorded during the reporting period. Current existing sediment controls working (Bathurst, 2024a). There has

Resource consent	Activity description	Annual compliance review of conditions reported against			Comments
		Comply – Full / Comply – At Risk	Low Risk Non-Compliance	Not Assessed	
		2021/22 (Bathurst, 2022)	2022/23 (Bathurst, 2023)	2023/24 (Bathurst, 2024)	
					been no evidence of, or sightings of any of the stipulated adverse effects occurring during the reporting period (Bathurst, 2024a). As part of the mine closure project any remaining overburden areas in McCabes will be rehabilitated to the exacting standards of Stockton rehabilitation methodology to mitigate AMD production, promote stable landforms and reduce sediment exposure (Bathurst, 2024a).
RC09028	Millerton mining operations water permits and discharge permits.				No evidence of, or sightings of any of the stipulated adverse effects occurring during the reporting period that could be attributed to mine activities (Bathurst, 2024a). S6 macroinvertebrate results (2012) were compared to baseline results published in the WR89038 application (1991). Using the macroinvertebrate community index (MCI) macroinvertebrate health increased slightly over this time (Bathurst, 2024a).
RC11138	Mussel shell leach beds discharge permits.				Total ammonia nitrogen remains below the compliance limit (Bathurst, 2024a). CBOD levels show no obvious trend since monitoring began (Bathurst, 2024a). pH levels have rebounded since the lows in April and May 2022 but remain subdued as the mussel shell bioreactor neutralising effect is now much reduced (Bathurst, 2024a).
RC01104	Ngākawau CHF coastal permits and water permit.				There is compliance in all cases apart from the 10 sample rolling median TSS, which slightly exceeds the 50 mg/L limit early in the 2021/22 reporting year. The calculation up until October 2021 includes the high TSS value of 348 mg/L recorded on 28/01/2022 (relating to a burst pump at the polishing pond). This sample was deliberately (and therefore conservatively) included in the monthly data suite for 2020/21, and makes its way into the 10 sample rolling median

Resource consent	Activity description	Annual compliance review of conditions reported against			Comments
		Comply – Full; Comply – At Risk; Low Risk Non-Compliance; Not Assessed			
		2021/22 (Bathurst, 2022)	2022/23 (Bathurst, 2023)	2023/24 (Bathurst, 2024)	
					calculation up until October 2021. The incident was immediately notified, and long term corrective actions were put in place (upgraded water treatment facility). This was detailed in the 2020/2021 Stockton Annual Compliance report (Bathurst, 2022). There has been no evidence of, or sightings of any of the stipulated adverse effects occurring during the reporting period (Bathurst, 2023). Non-compliance at S32B for pH. However, all other sites comply. There has been no evidence of, or sightings of any of the stipulated adverse effects occurring during the reporting period (Bathurst, 2024a). Whitebait at the discharge point by the Bathurst Water Sampler (Bathurst, 2024a).
RC11088	No 2 South land use consent, water permit and discharge permits.				No sediment-contaminated water is discharged from the No 2 South area to the Waimangaroa / Granity Conservation Area. All runoff is treated via existing Stockton Water Management Infrastructure (Bathurst, 2024a). The water management is as per the Water Management Plan, required by the Department of Conservation's Access Arrangement, and is in compliance with this Condition. All contaminated water from the No. 2 South mining blocks is directed to No 1 North dam. See No.2 South Annual Workplan, submitted in conjunction with this report, for current mining areas (Bathurst, 2024a).
RC07179	No 5 station ponds discharge permit.				The settling ponds and settlement sump are maintained on an ongoing basis to ensure consent compliance. The cleaning and maintenance record is available upon request (Bathurst, 2024a).

Resource consent	Activity description	Annual compliance review of conditions reported against				Comments
		Comply – Full	Comply – At Risk	Low Risk Non-Compliance	Not Assessed	
		2021/22 (Bathurst, 2022)	2022/23 (Bathurst, 2023)	2023/24 (Bathurst, 2024)		
RC07072	T31, T35 and Fly Creeks water permit for diversion associated with Campbell's overburden site.					-
RC89038-V6	Water related consents for Stockton mining operation.					-

Appendix C

Consented water takes and registered water bores

C-1 Consented surface water takes within and downstream of the Stockton and Waimangaroa BPCP areas

Table C.1 Consented surface water takes within and downstream of the Stockton and Waimangaroa BPCP areas (source: MWM, 2026)

Catchment	Consent	Type and location	Max (m^3/year)	Max (L/s)	Ref	Expires
Waimangaroa	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Ngākawau	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	[redacted]					
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

Table C.2 *Summary of groundwater consents within the study area (source: West Coast Regional Council, 2026, cited in GHD, 2026)*

Primary purpose / Held by	Consent number	Duration	Catchment	WCRC consents database description
Stockton Mining / BT Mining	RC07007-2	2007 - 2028	Mangatini	To take ground water associated with the construction of "Duncan's Sump", Stockton Coal Mine.
	RC07229-4	2008 - 2028	Mangatini	To take ground water associated with the construction and operation of the "Mangatini Sump", Stockton Coal Mine.
	RC10256-3	2010 - 2027	St Patrick	To take groundwater (seepage) from the mine pit, McCabes Block, Stockton.
Mining outside Stockton / BT Mining	RC03175-7	2004 - 2039	St Patrick	To take groundwater seepage and stormwater runoff from within the Cypress opencast working for dewatering purposes, at a rate of up to 600 litres per second.
	RC11181-4	2014 - 2049	St Patrick	To take and divert groundwater seepage and stormwater runoff from within the opencast pit at the Mt William North mining area for dewatering purposes.
	RC11012-4	2011 - 2046	St Patrick	To take, divert and use groundwater (including seepage) within the scheme area defined in Figure A associated with

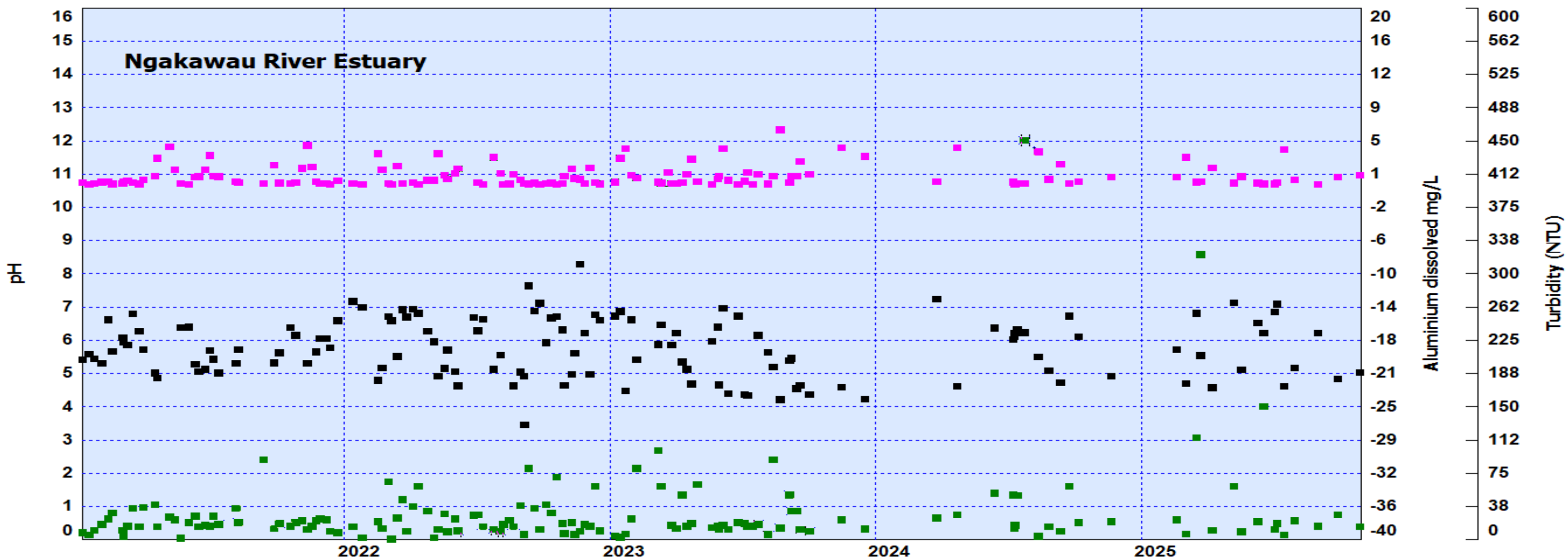
Primary purpose / Held by	Consent number	Duration	Catchment	WCRC consents database description
				the construction, use, operation, repair, and maintenance of the St Pats 2 Water Treatment Scheme.
	RC11237-4	2012 - 2047	St Patrick	To take, divert and use groundwater (including seepage) within the scheme area associated with the construction, use, operation, repair, and maintenance of the Lower St Pat's Reservoir Water Treatment Scheme.
	RC12073-2	2012 - 2047	St Patrick	To take and use groundwater from seepage, Lower St [redacted]

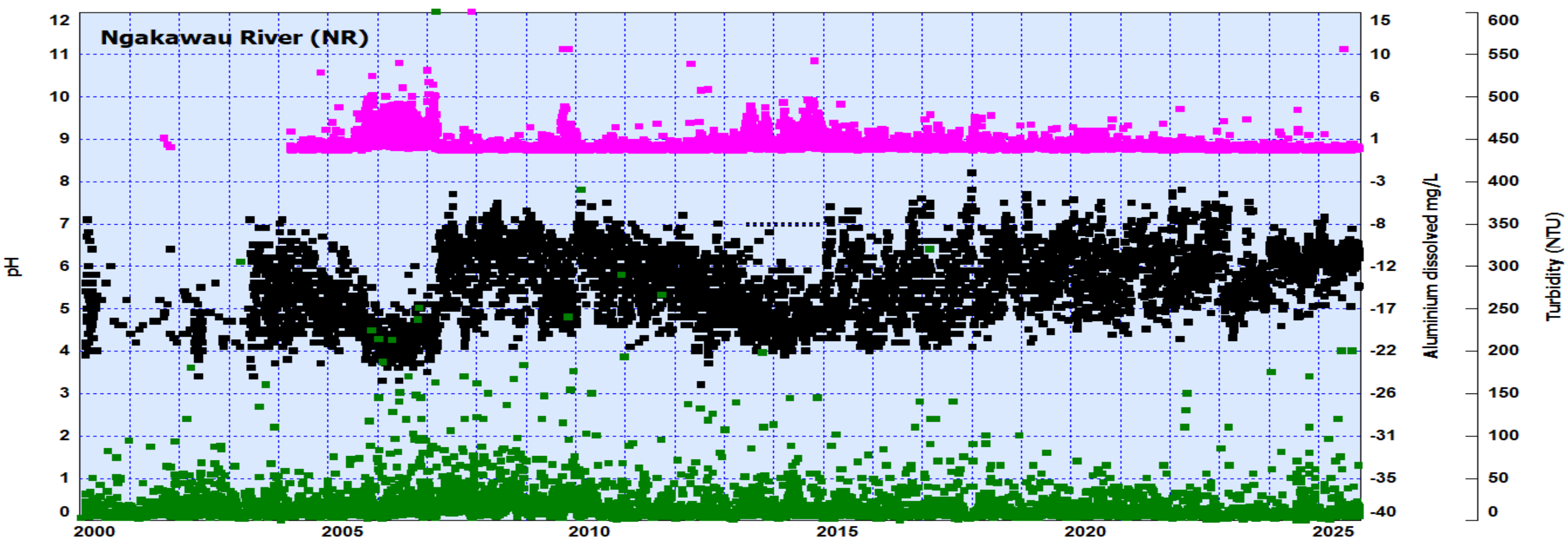
[redacted]

Appendix D

Stockton waterway quality monitoring data (source Bathurst)

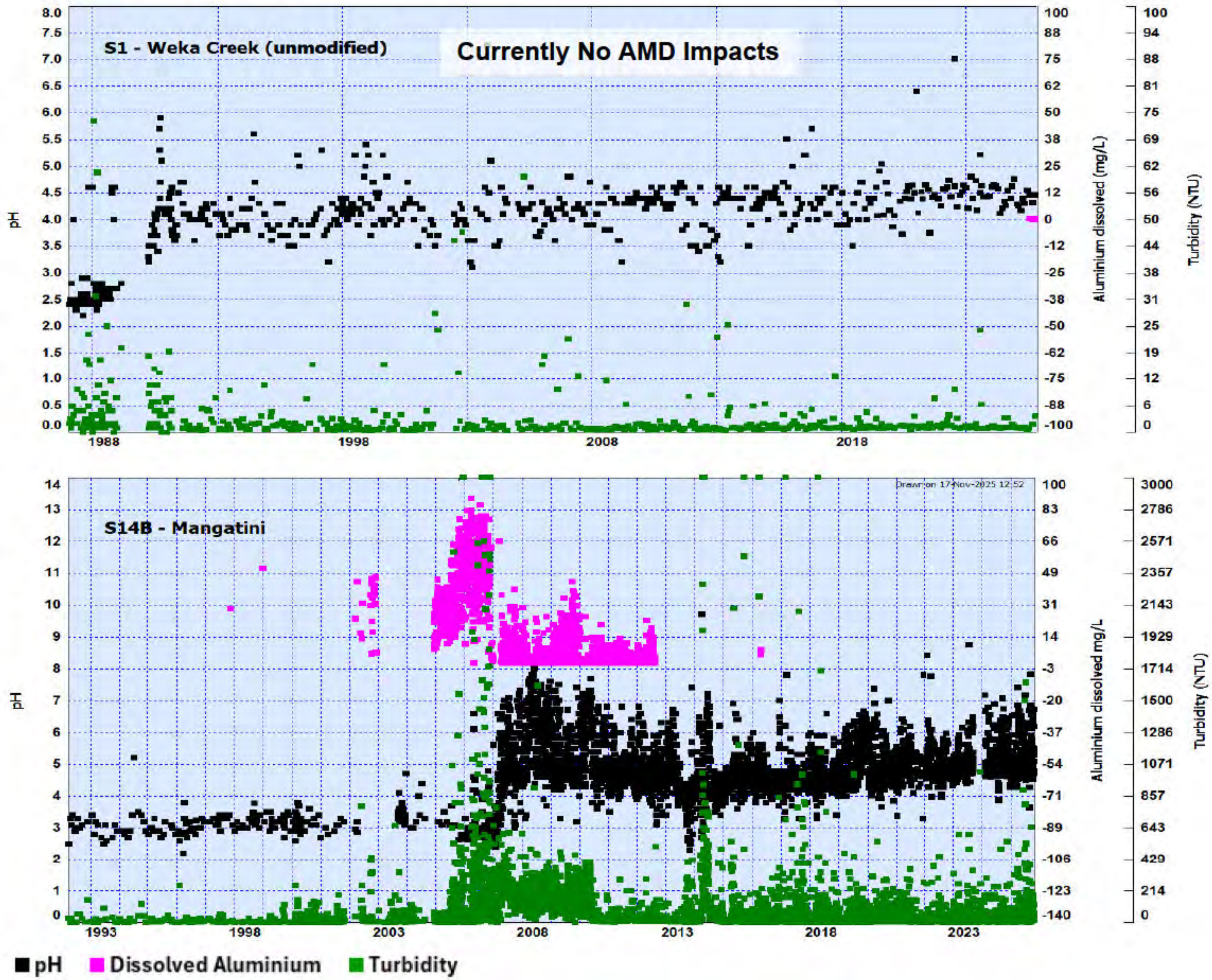
D-1 Ngākawau River

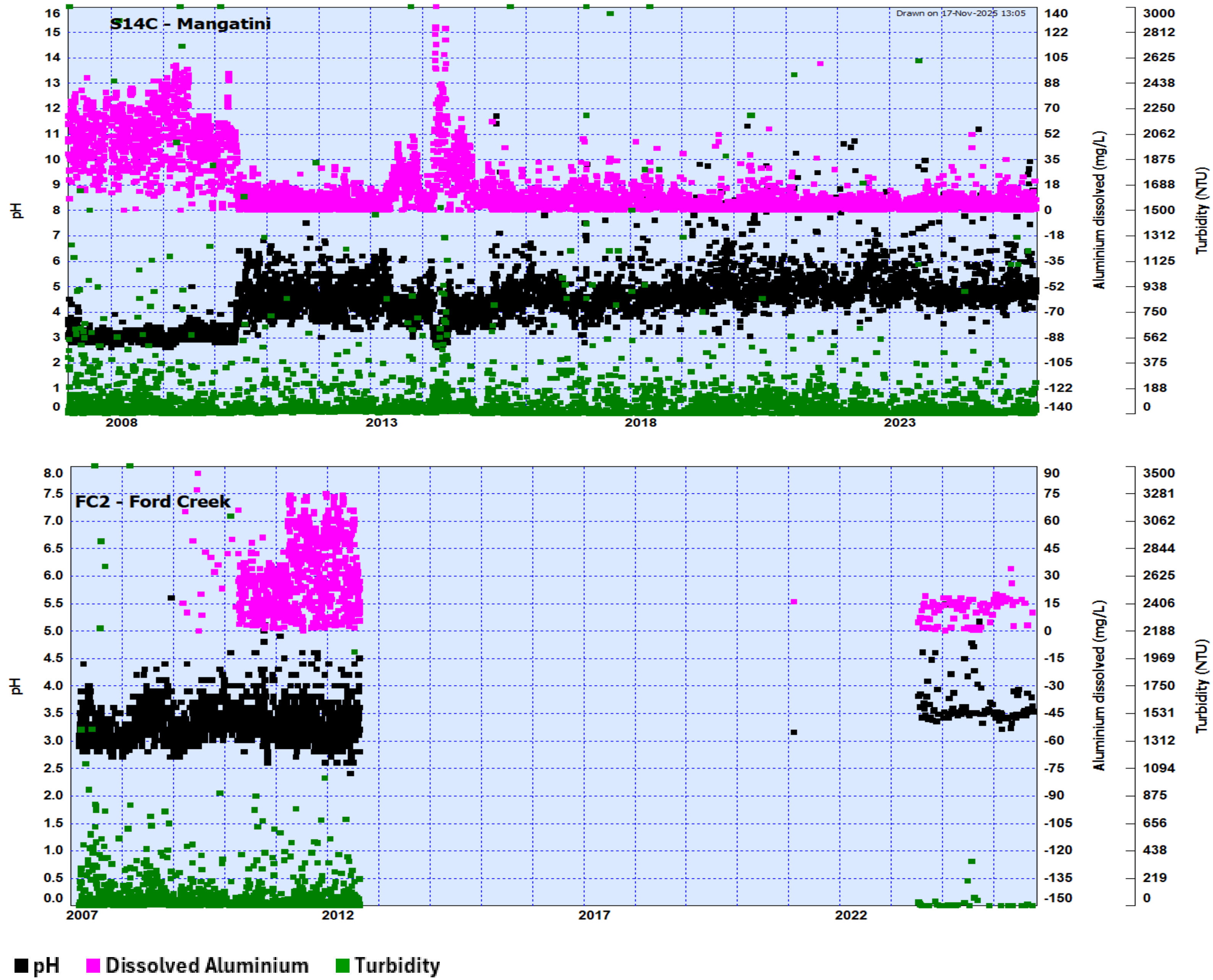




■ pH ■ Dissolved Aluminium ■ Turbidity

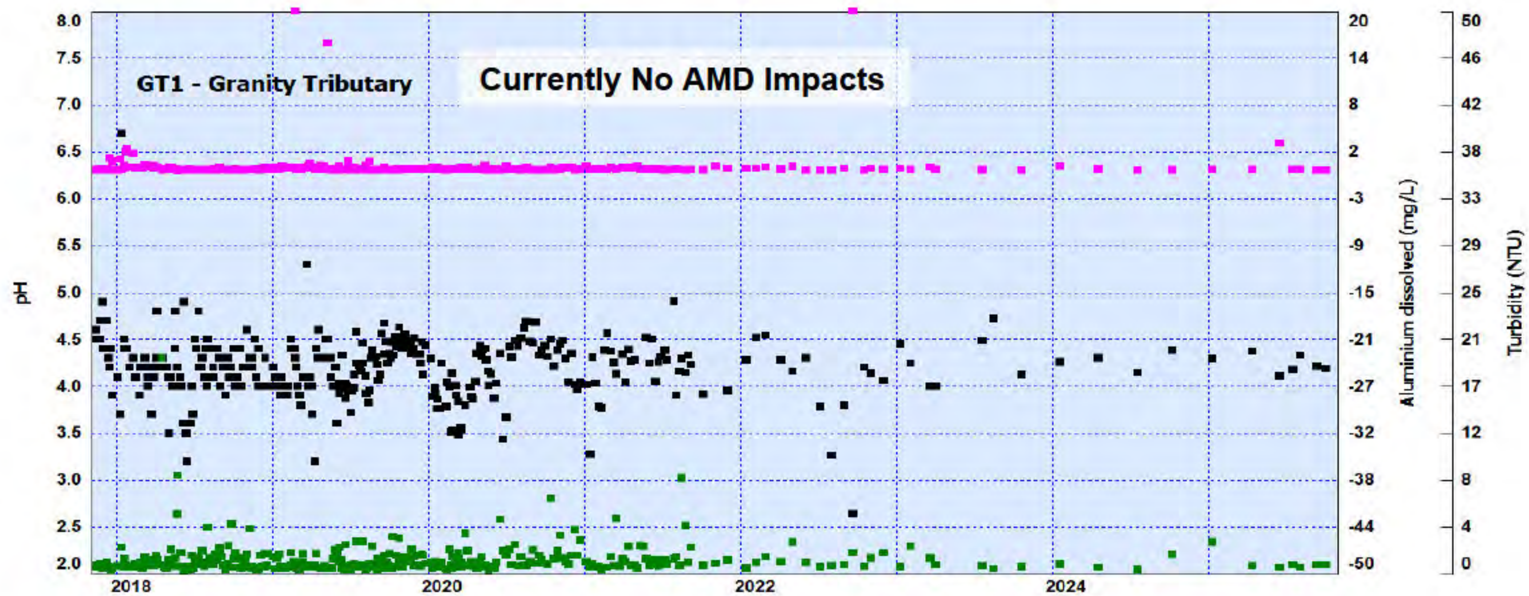
D-2 Mangatini catchment

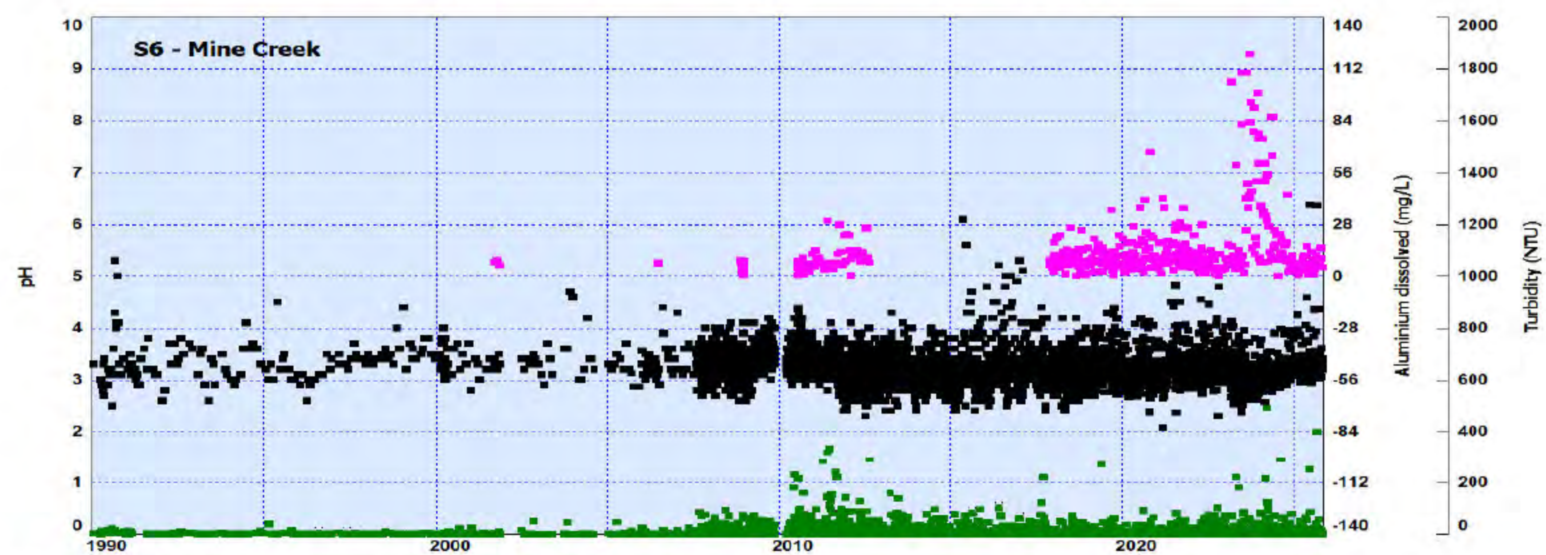




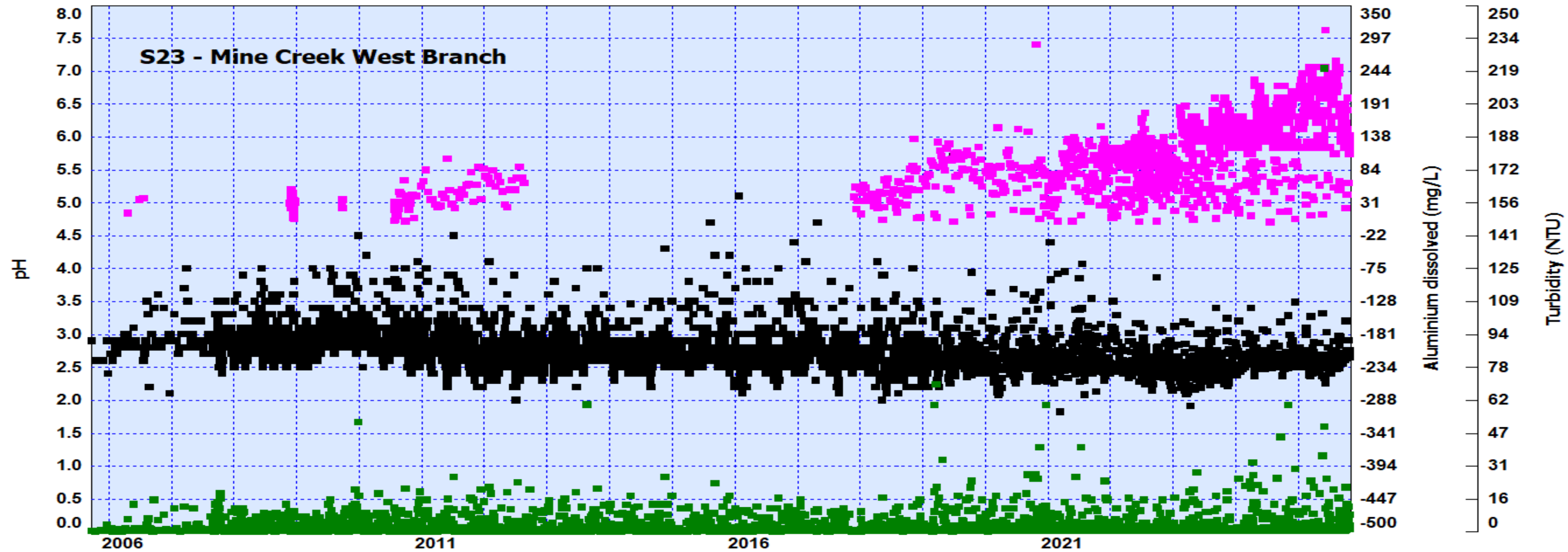
S14C - Mangatini
Drawn on 17-Nov-2025 13:05
pH
Aluminium dissolved (mg/L)
Turbidity (NTU)
2008
2013
2018
2023
FC2 - Ford Creek
2007
2012
2017
2022
pH
Dissolved Aluminium
Turbidity

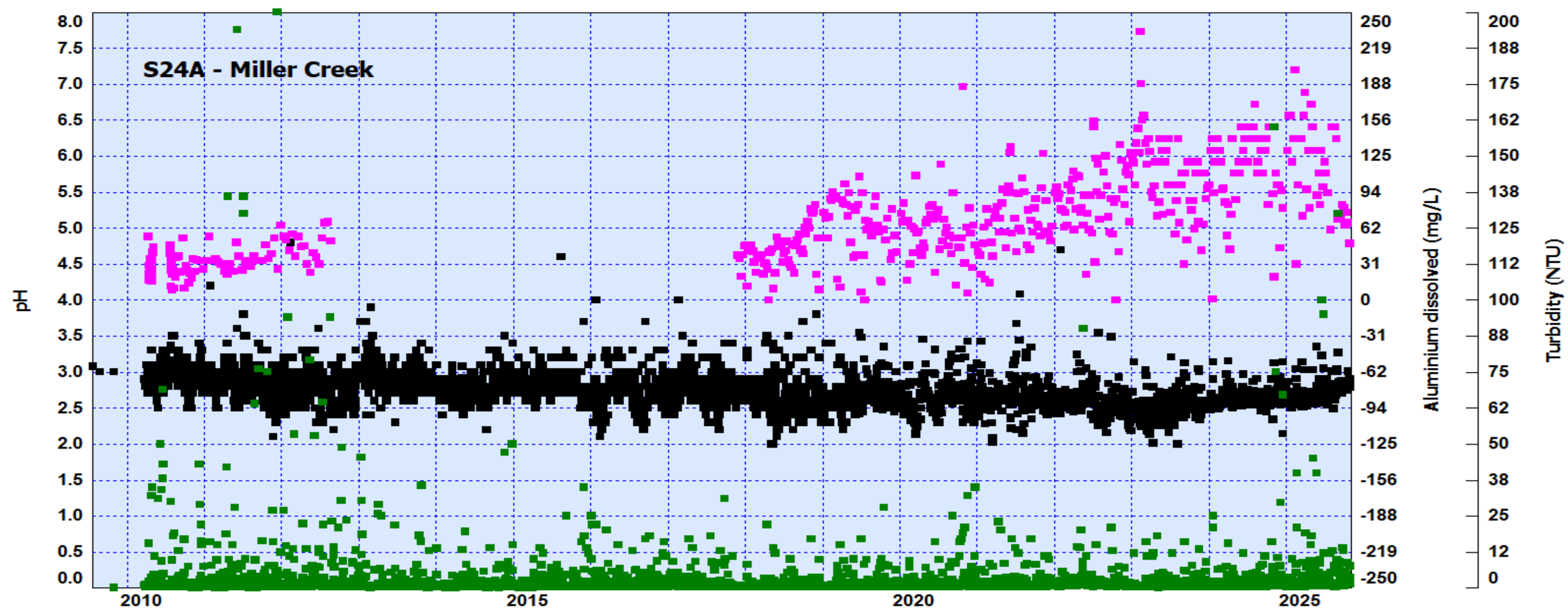
D-3 Millerton Block



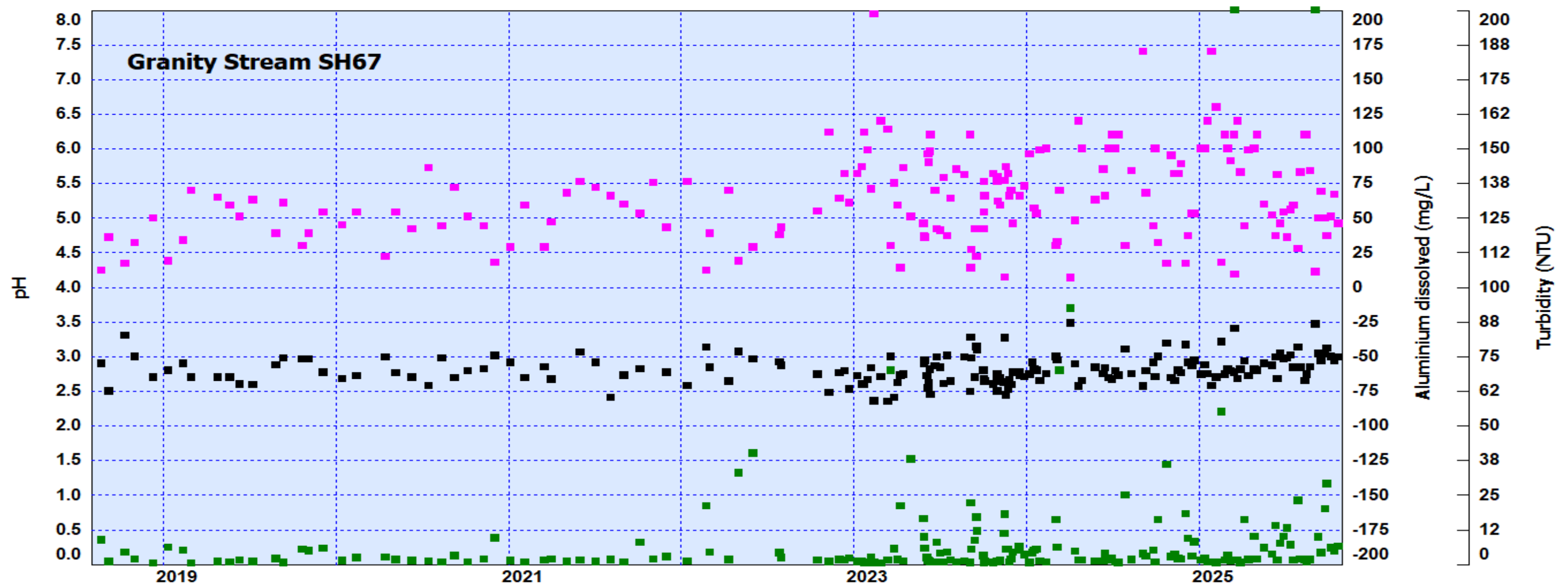


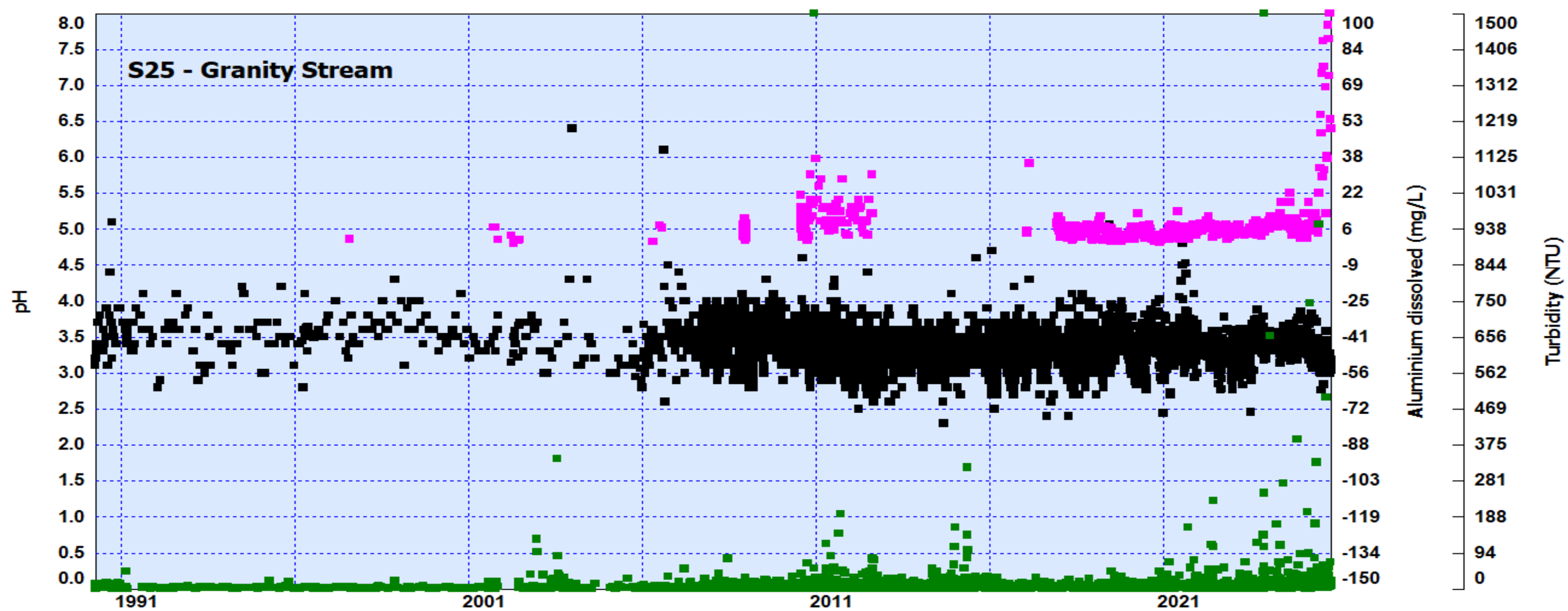
■ pH ■ Dissolved Aluminium ■ Turbidity



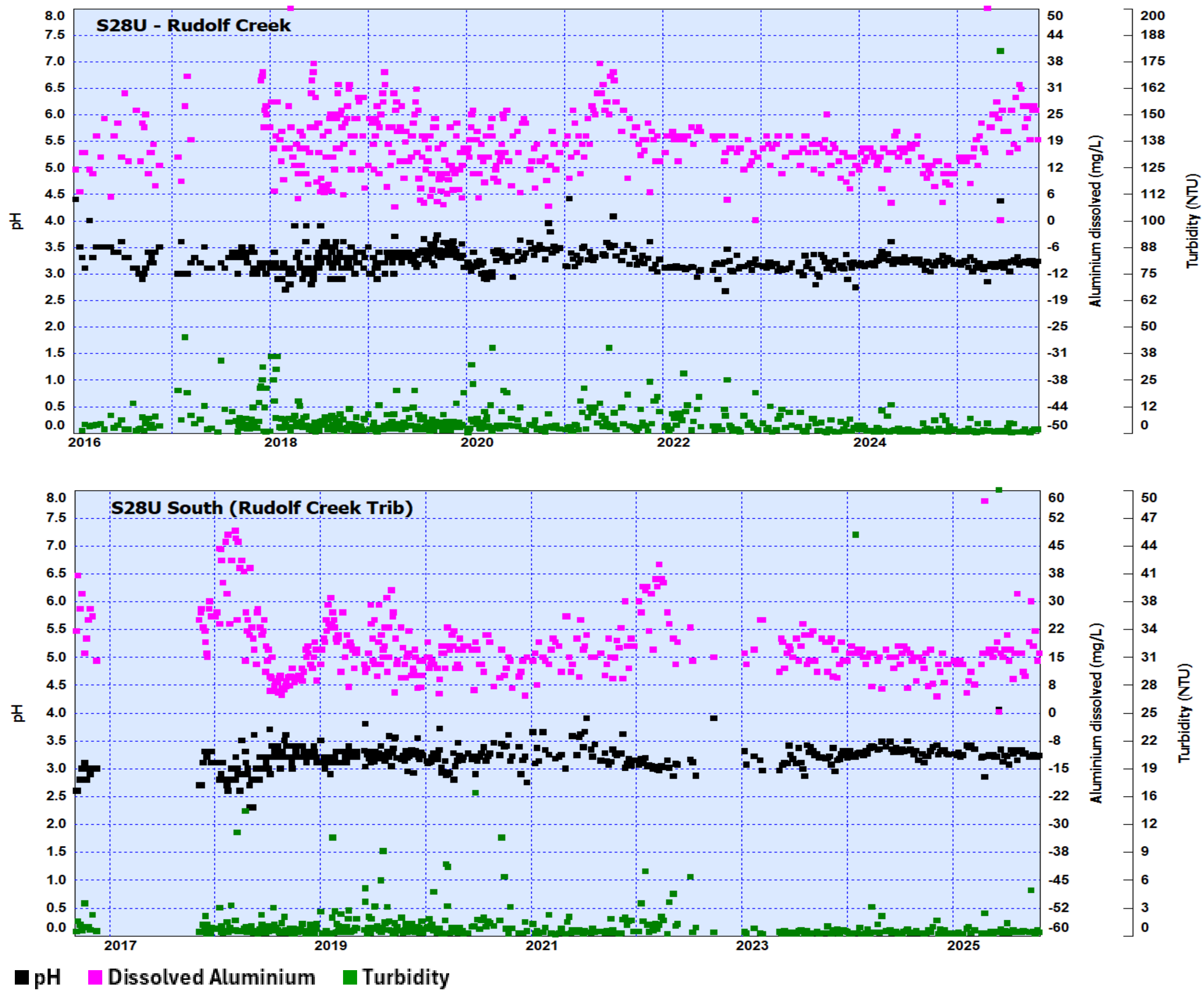


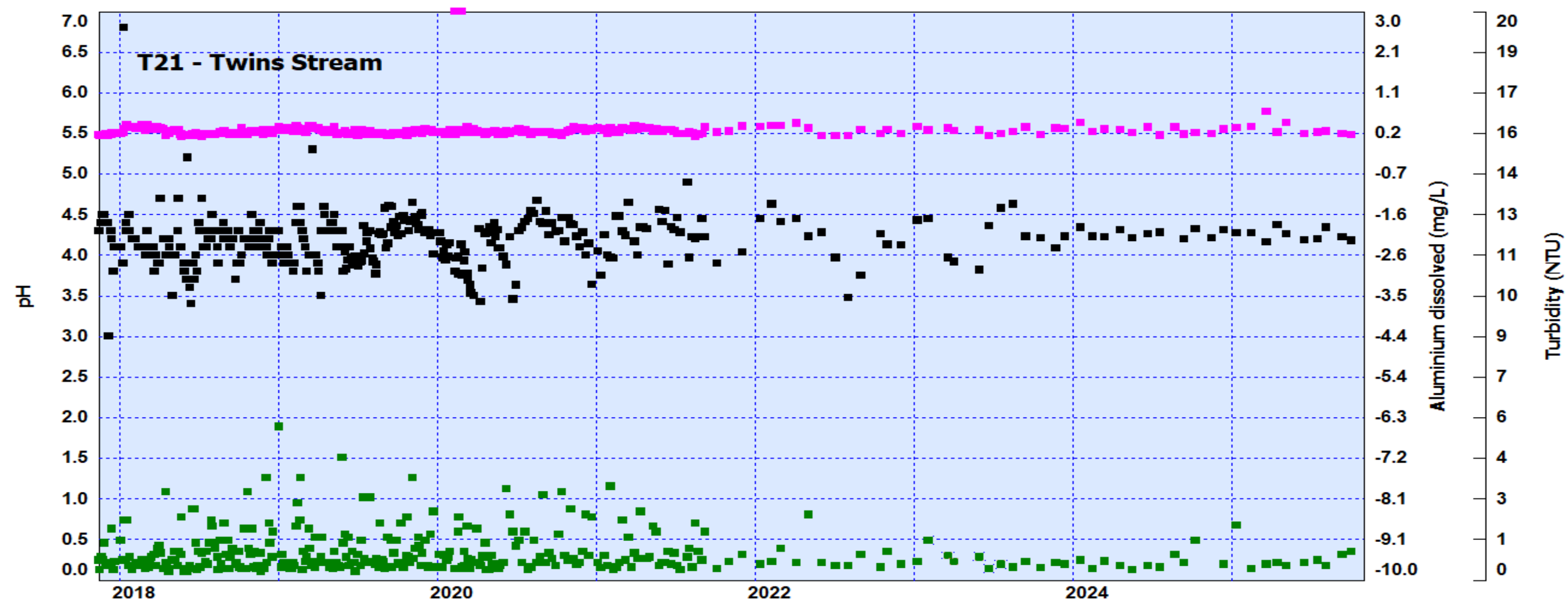
pH   Dissolved Aluminium   Turbidity

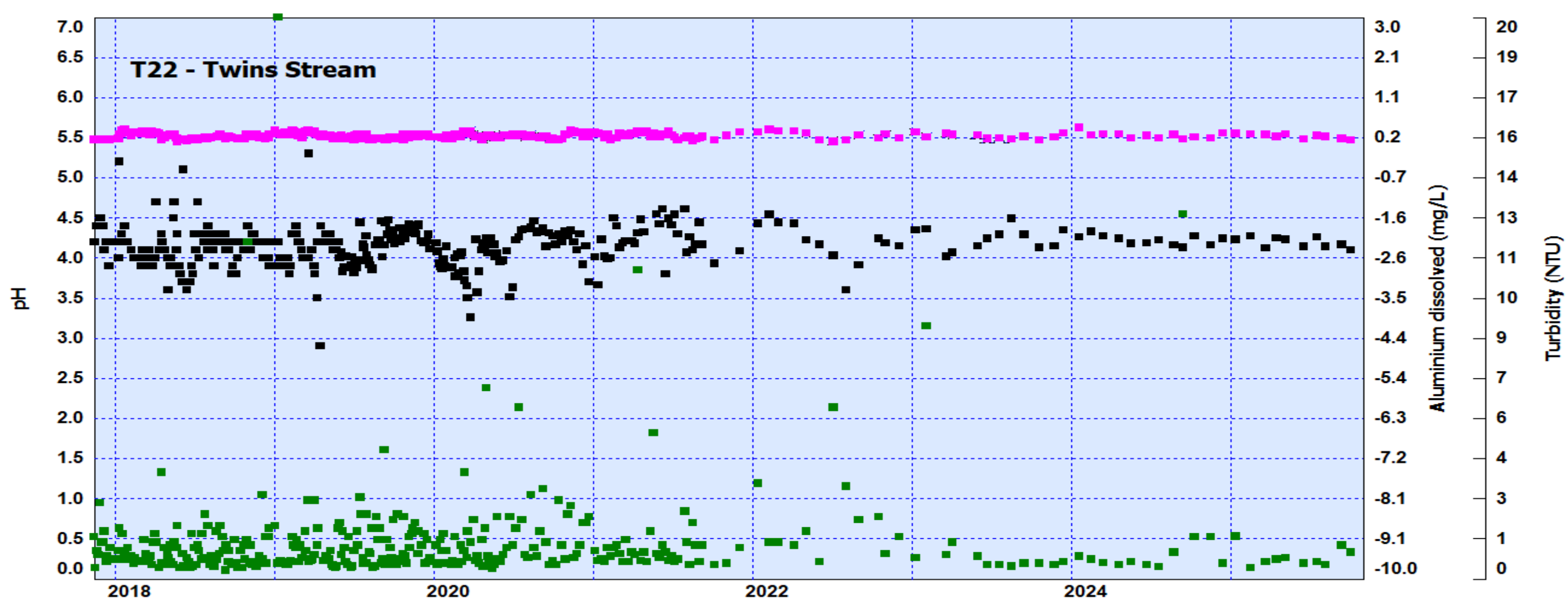




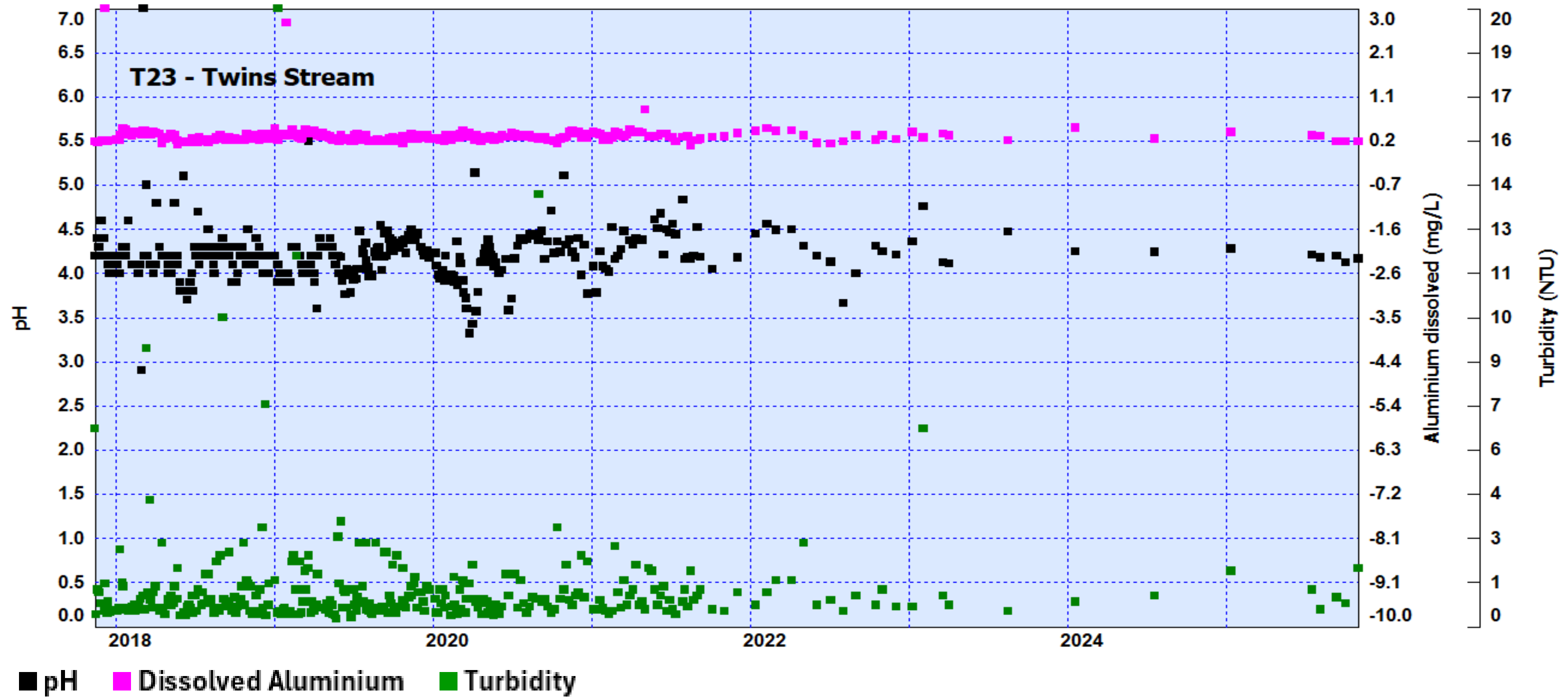
■ pH ■ Dissolved Aluminium ■ Turbidity


S28U - Rudolf Creek
pH
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2016
2018
2020
2022
2024
Aluminium dissolved (mg/L)
50
44
38
31
25
19
12
6
0
-6
-12
-19
-25
-31
-38
-44
-50
Turbidity (NTU)
200
188
175
162
150
138
125
112
100
88
75
62
50
38
25
12
0
S28U South (Rudolf Creek Trib)
pH
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2017
2019
2021
2023
2025
Aluminium dissolved (mg/L)
60
52
45
38
30
22
15
8
0
-8
-15
-22
-30
-38
-45
-52
-60
Turbidity (NTU)
50
47
44
41
38
34
31
28
25
22
19
16
12
9
6
3
0
pH
Dissolved Aluminium
Turbidity



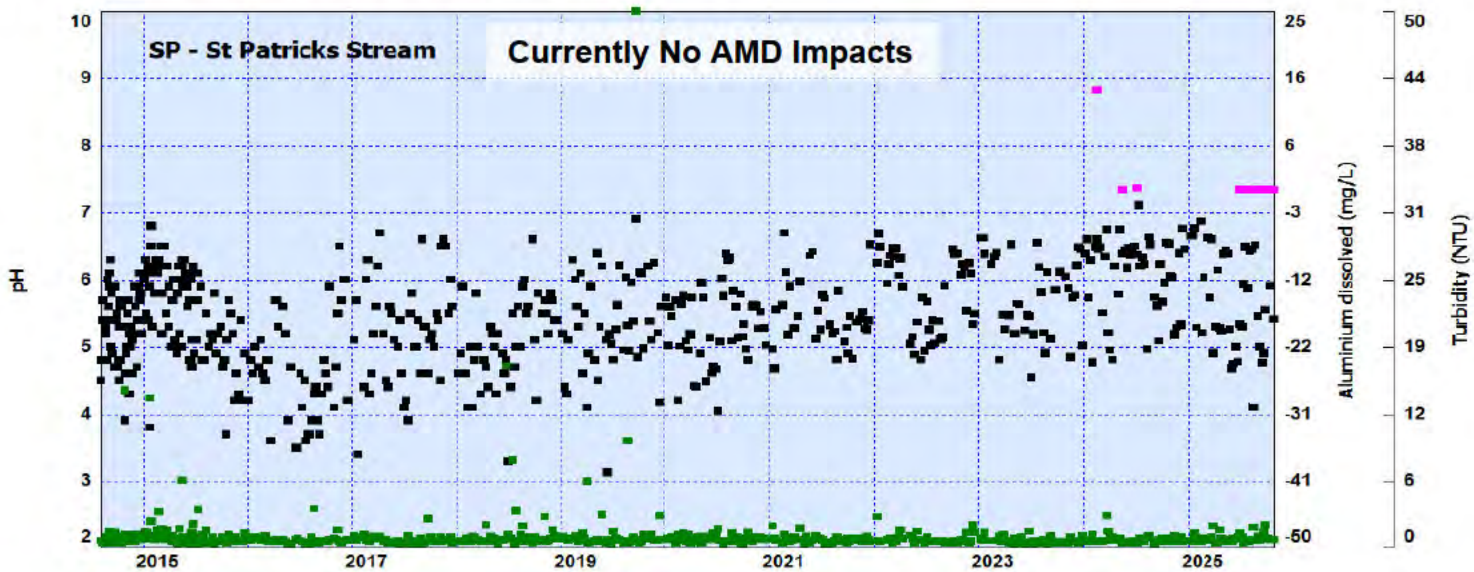


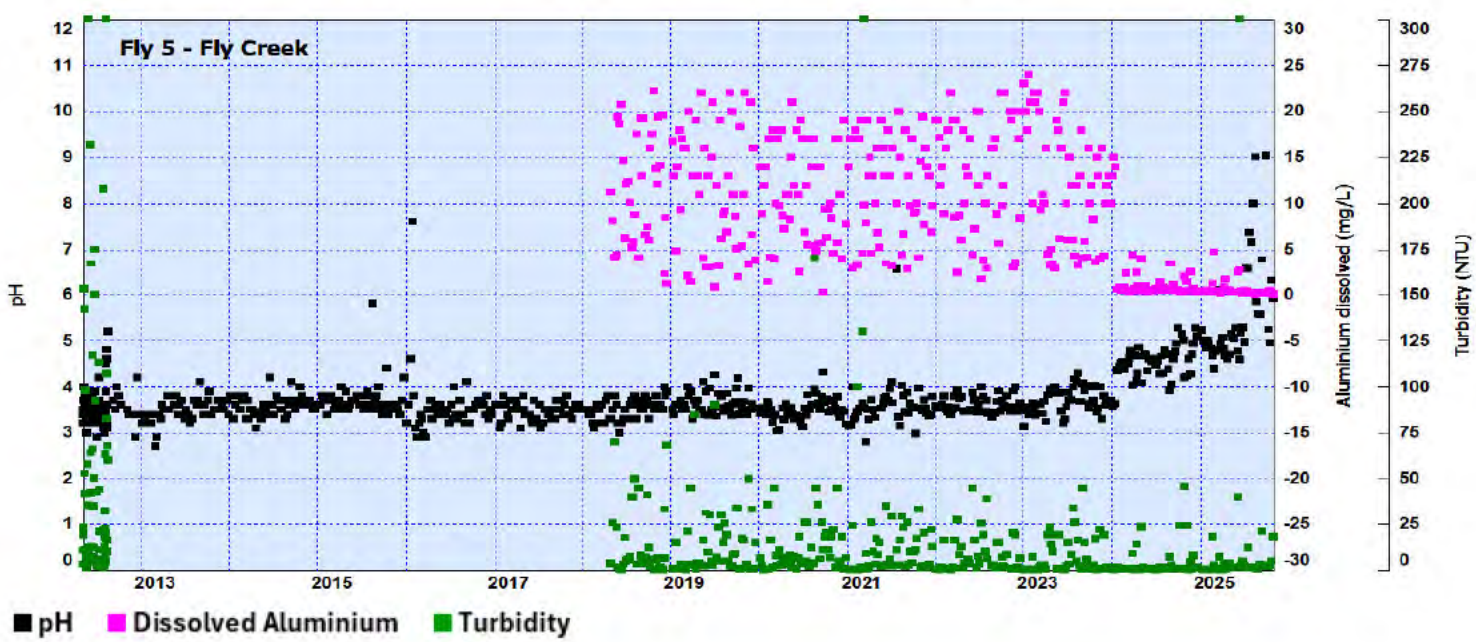
■ pH ■ Dissolved Aluminium ■ Turbidity

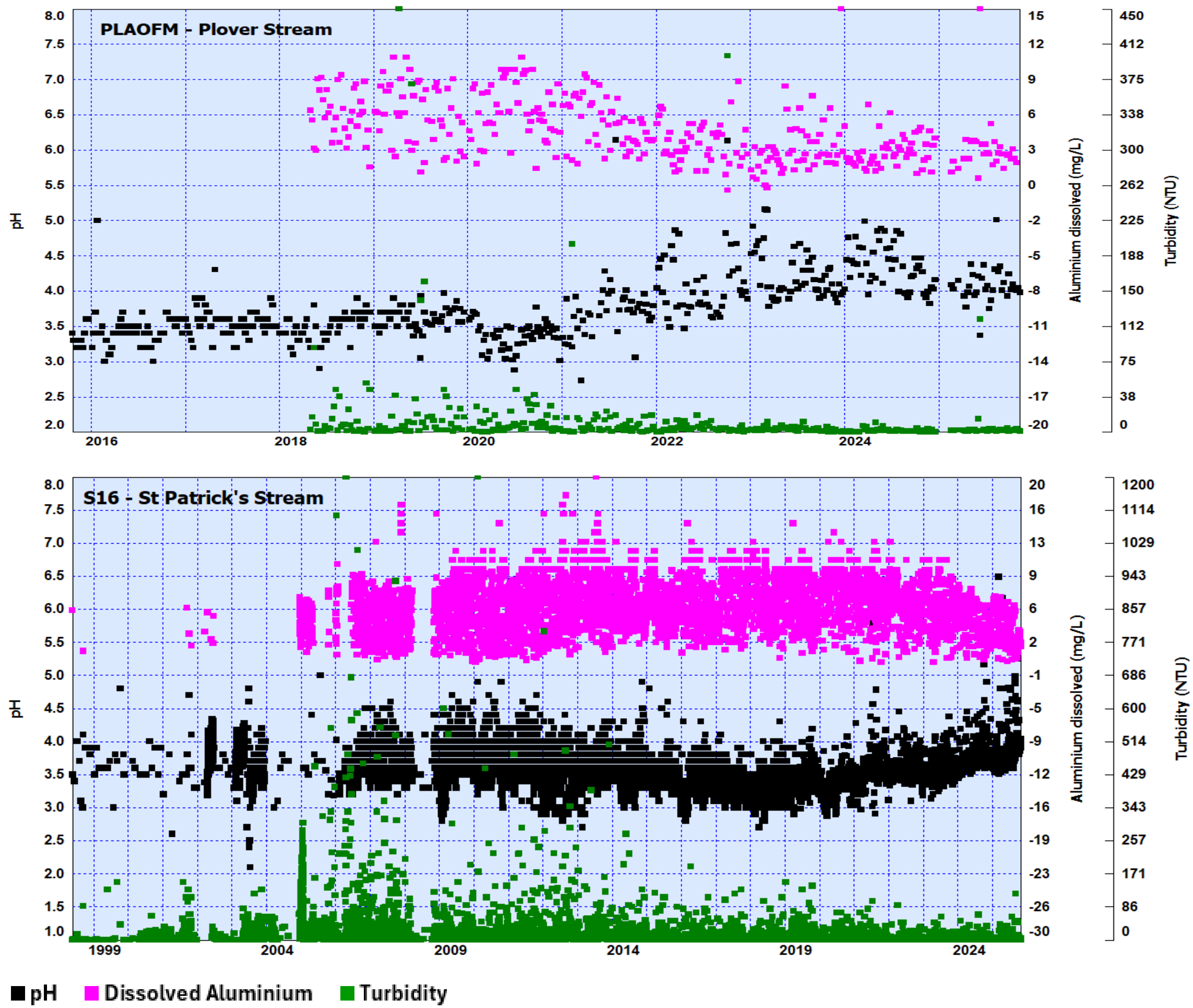


T23 - Twins Stream
pH
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Aluminium dissolved (mg/L)
3.0
2.1
1.1
0.2
-0.7
-1.6
-2.6
-3.5
-4.4
-5.4
-6.3
-7.2
-8.1
-9.1
-10.0
Turbidity (NTU)
20
19
17
16
14
13
11
10
9
7
6
4
3
1
0
2018
2020
2022
2024
pH
Dissolved Aluminium
Turbidity

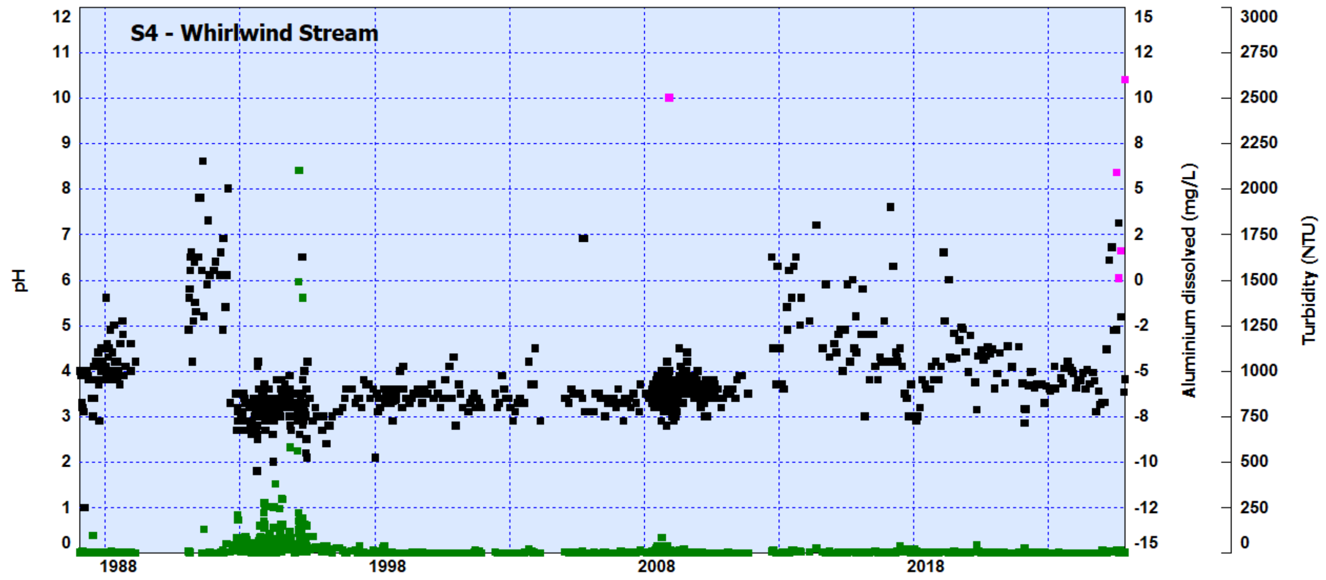
D-4 St Patrick catchment

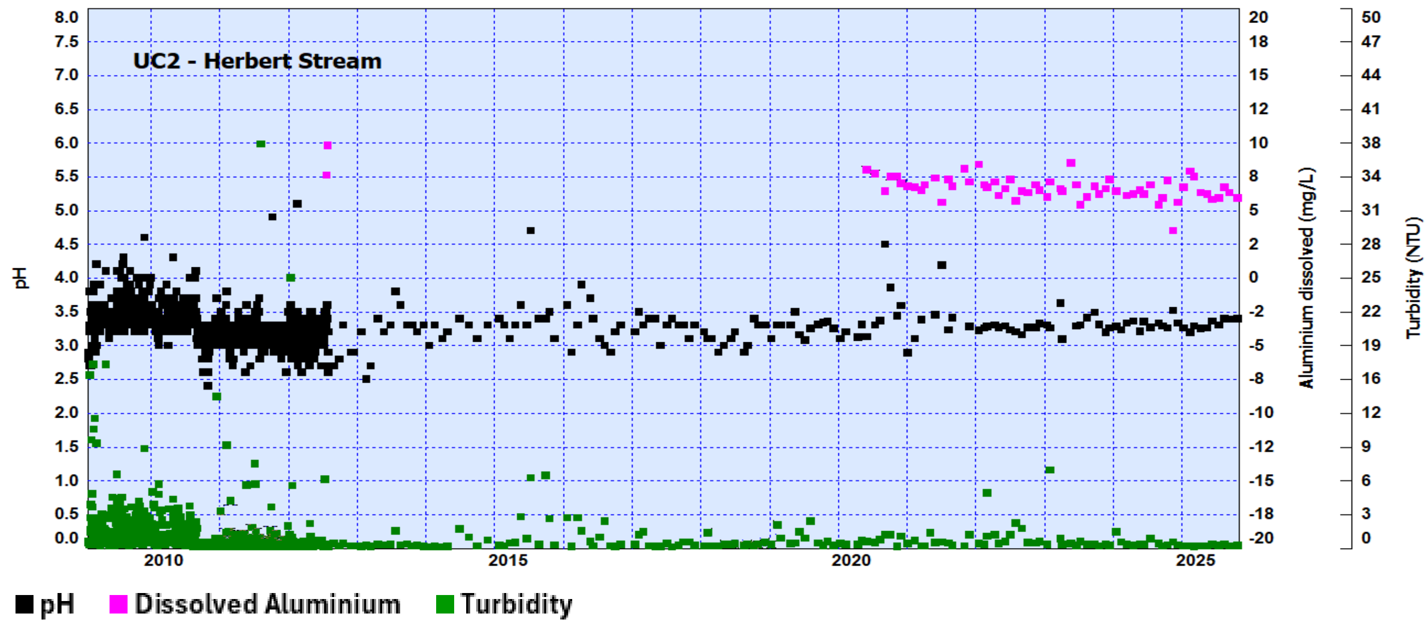





PLAOFM - Plover Stream
pH
8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0
Aluminium dissolved (mg/L)
15 12 9 6 3 0 -2 -5 -8 -11 -14 -17 -20
Turbidity (NTU)
450 412 375 338 300 262 225 188 150 112 75 38 0
2016 2018 2020 2022 2024
S16 - St Patrick's Stream
pH
8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0
Aluminium dissolved (mg/L)
20 16 13 9 6 2 -1 -5 -9 -12 -16 -19 -23 -26 -30
Turbidity (NTU)
1200 1114 1029 943 857 771 686 600 514 429 343 257 171 86 0
1999 2004 2009 2014 2019 2024
pH
Dissolved Aluminium
Turbidity

D-5 Upper Waimangaroa catchment





Appendix E

History of AMD Management and Proposed Future Management (Bathurst, 2026c)

Appendix F

Millerton Water and AMD Management Report (Bathurst, 2026a)

Appendix G

Stockton Mine 80-year water quality forecast (Bathurst, 2026b)

Appendix H

Stockton Operational AMD Sludge Management (Bathurst, 2025b)

Appendix I

Stockton Plateau Aquatic Ecology: history, thresholds and long-term management (Instream, 2026)

Appendix J

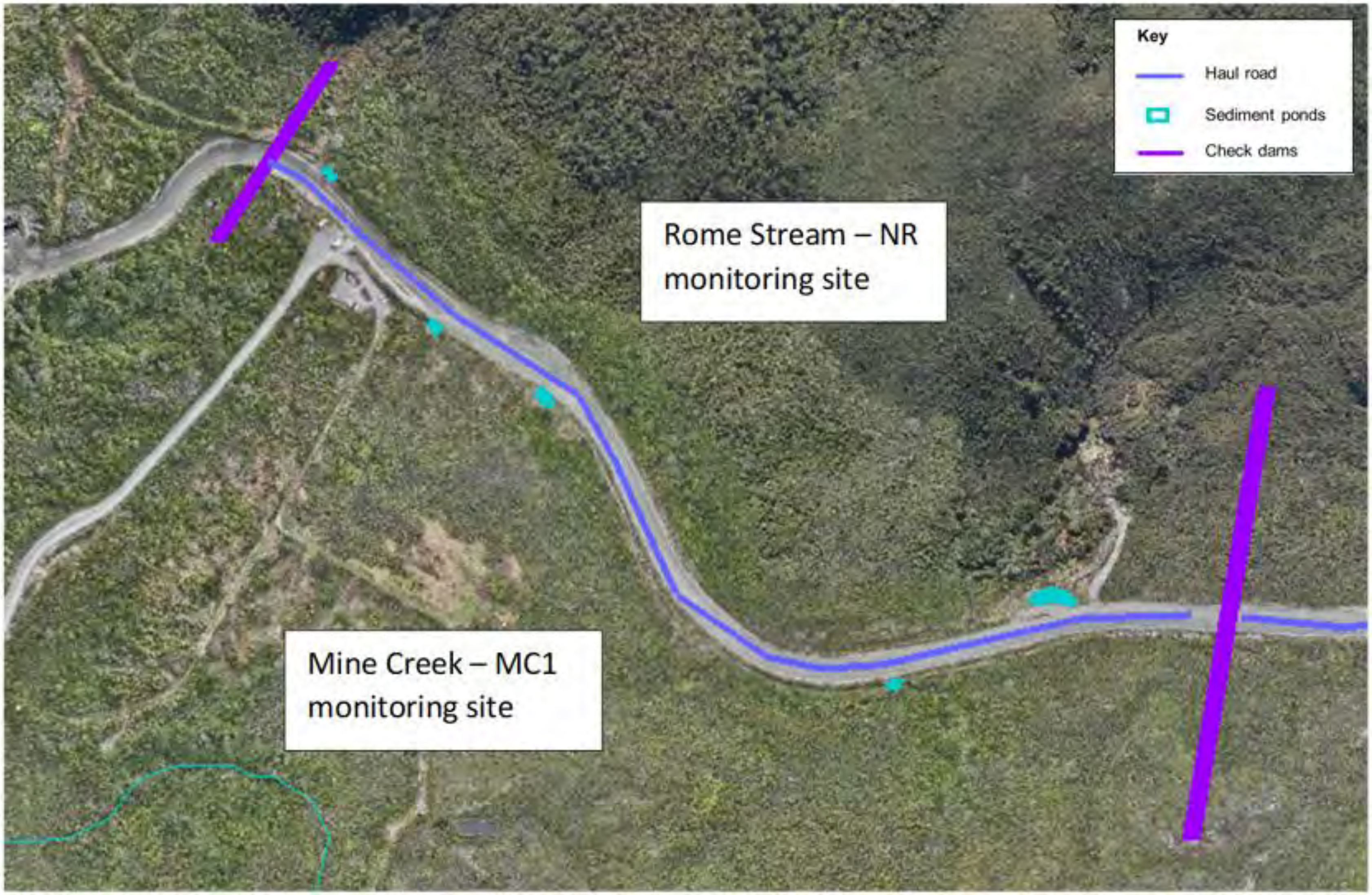
Hydrogeology of the Stockton area and the assessment of effects on groundwater from BPCP Stockton mining activities (GHD, 2026)

Appendix K

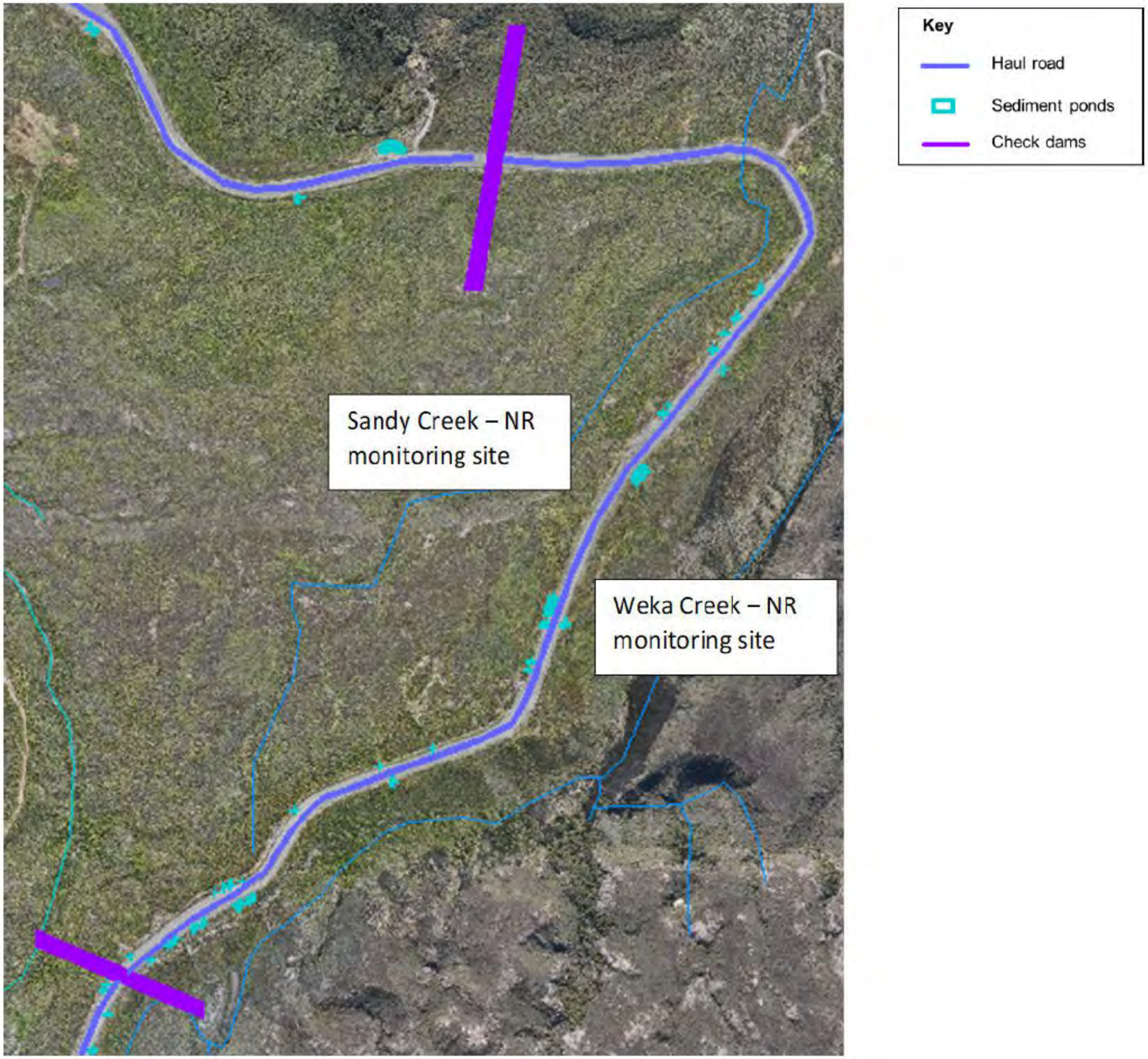
Current haul road check dams and runoff collection ponds (source: Bathurst, 2026)


Section 1
Section 2
Section 3
Section 4
Section 5
Coles Way
Mt Fred HR

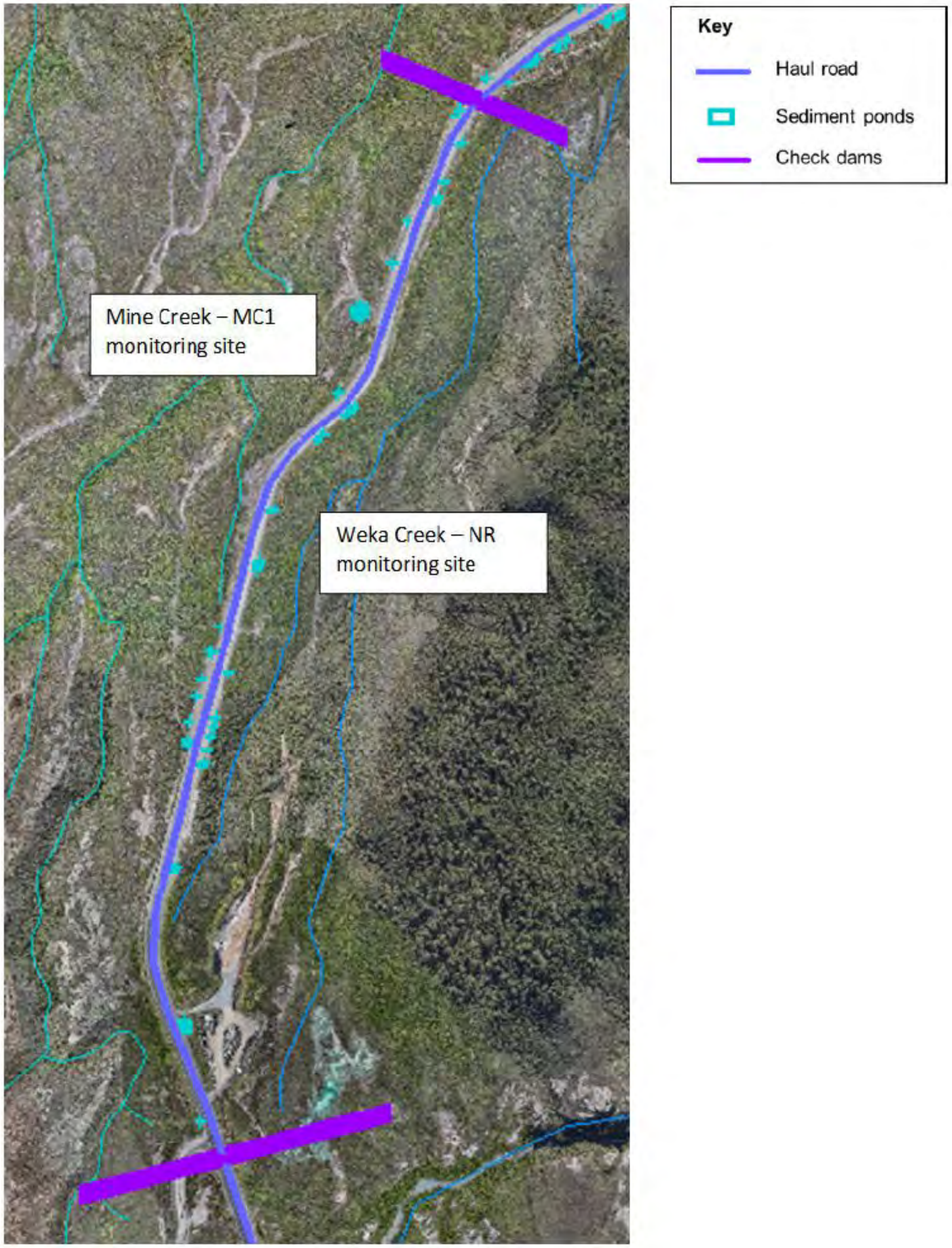
Haul Road Section 1



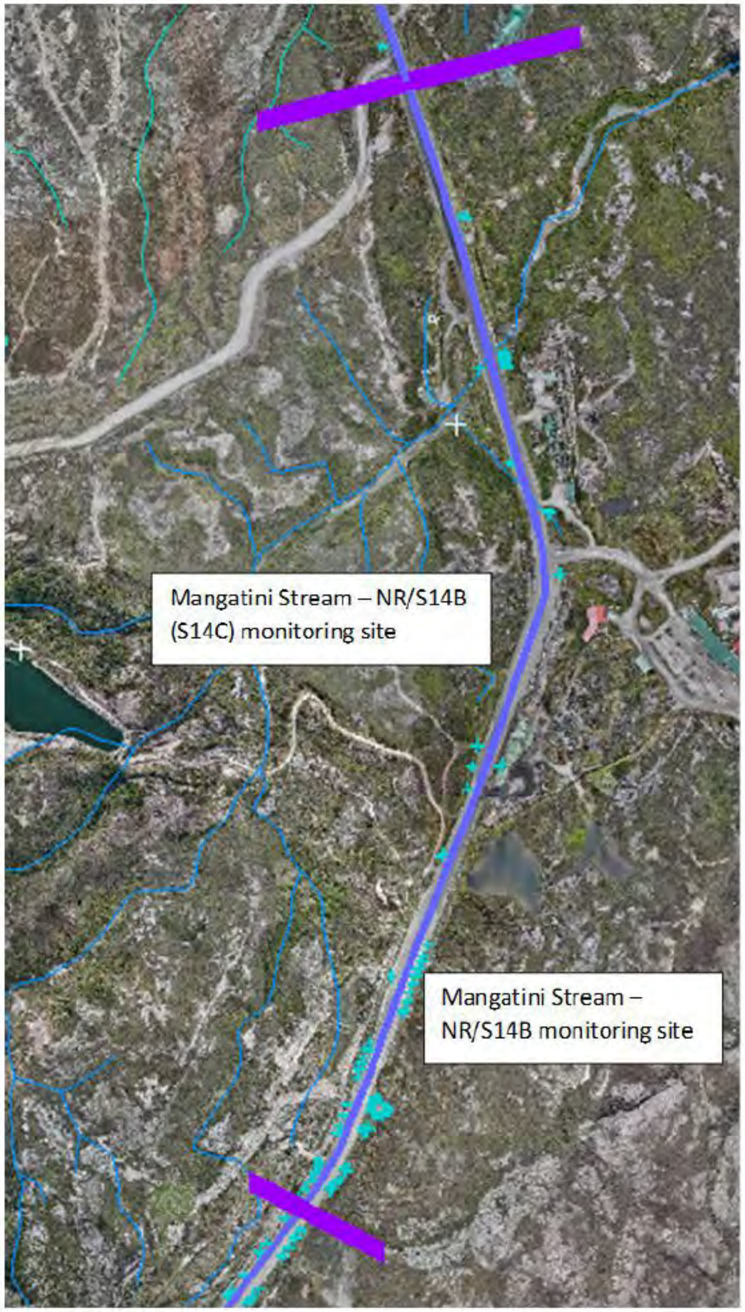
Haul Road Section 2

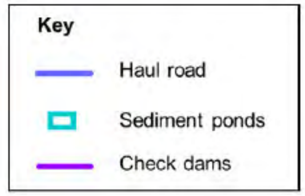


Haul Road Section 3

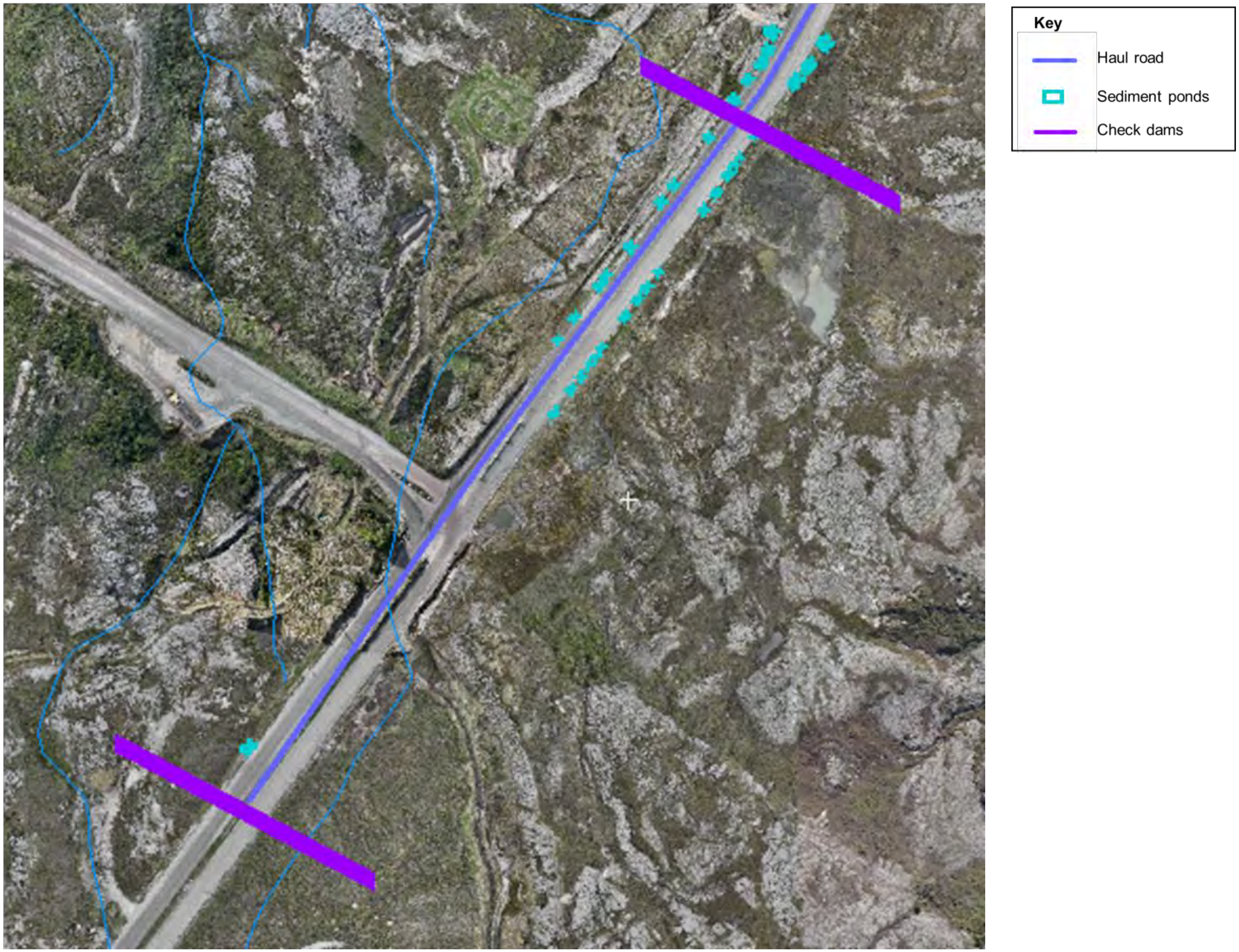


Haul Road Section 4

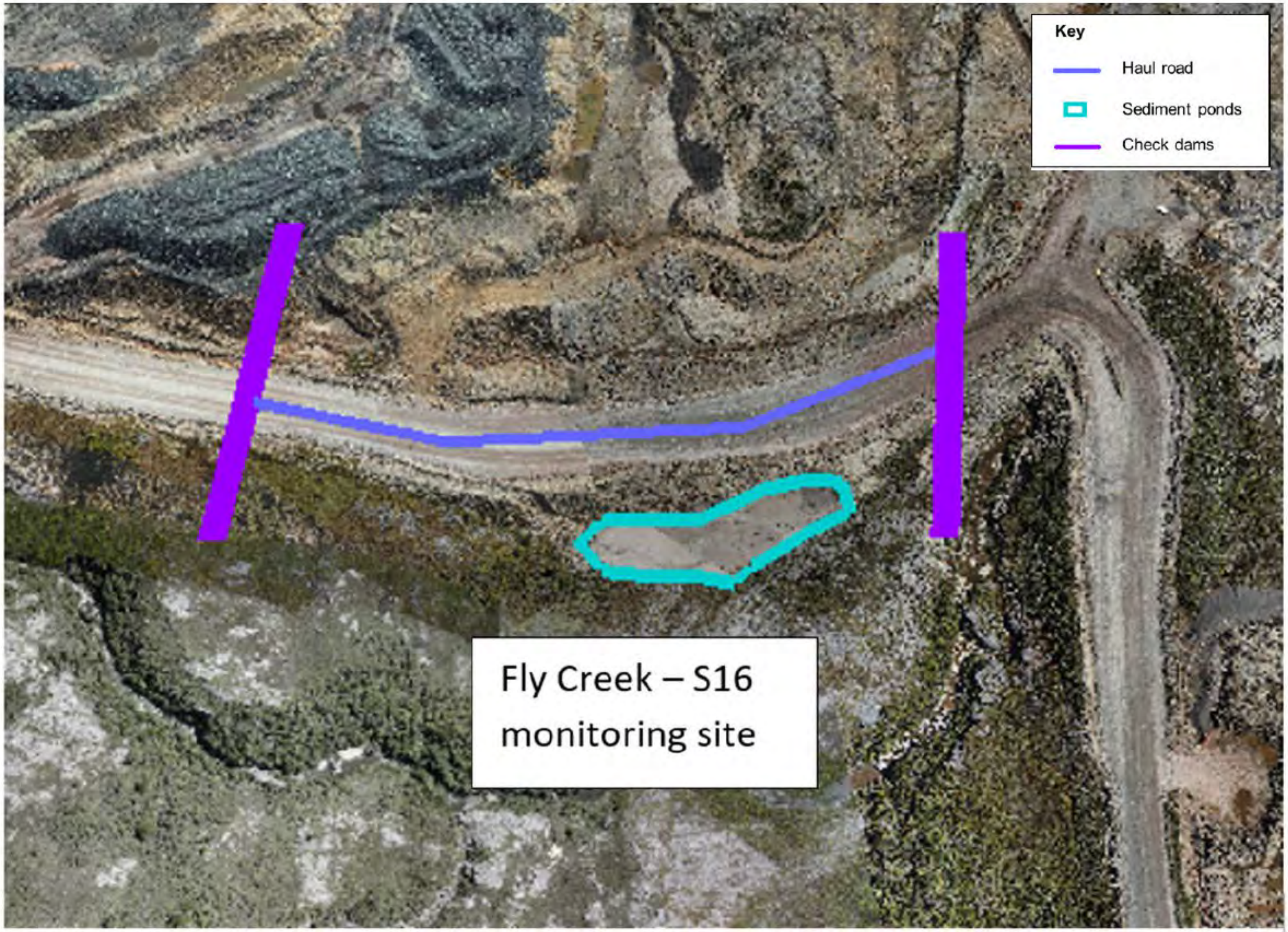




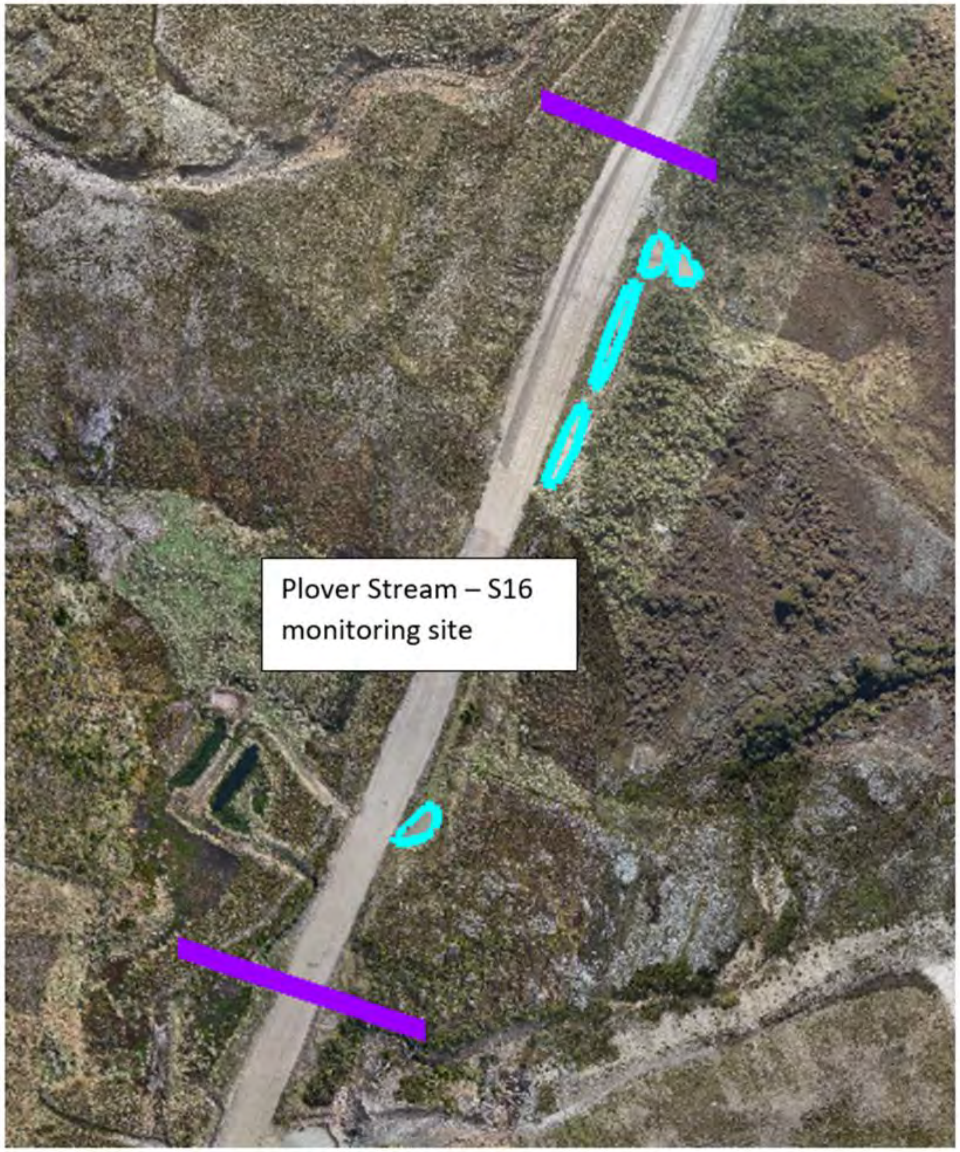
Haul Road Section 5

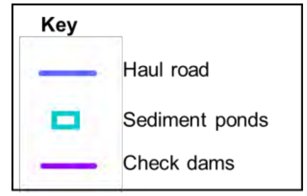


Coles Way


Key
Haul road
Sediment ponds
Check dams
Fly Creek – S16
monitoring site

Mount Fred Haul Road





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