



Aurizon Network
2017 Access Undertaking
FY23 Maintenance Costs Claim

September 2023



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1. Executive Summary

1.1 Overview

Aurizon Network Pty Ltd (**Aurizon Network**) is the accredited Rail Infrastructure Manager of the Central Queensland Coal Network (**CQCN**), the largest open-access coal rail network in Australia and one of the country's most complex rail freight networks. The CQCN is comprised of over 2,670 kilometres of heavy haul railway track, linking more than forty mines to five coal export terminals across four major Coal Systems and the Goonyella to Abbot Point Expansion (**GAPE**).

Unless otherwise defined, capitalised terms in this submission have the meaning given in the 2017 Access Undertaking (**UT5**).

Third party access to the CQCN is regulated by the Queensland Competition Authority (**QCA**) and managed in accordance with UT5. UT5 provides for customer involvement in the development and assessment of Aurizon Network's Maintenance and Renewal Strategies and Budgets (**MRSB**) for each year and for each Coal System.

Following consultation with stakeholders and the Rail Industry Group (**RIG**), Aurizon Network's final draft MRSB for the Financial Year ending 30 June 2023 (**FY23**) was provided to the Chair of the RIG on 21 January 2022. On 14 February 2022, the Chair of the RIG advised Aurizon Network and the QCA that the relevant Special Majority of End Users had approved the FY23 Maintenance Strategies and Budgets (**MSB**) for all Coal Systems.

During FY23, Aurizon Network has implemented the approved MSB for each Coal System and confirms that the CQCN maintenance program has been delivered having regard to the UT5 Maintenance Objectives (**Maintenance Objectives**). Specifically:

- Seeking to ensure that Committed Capacity is delivered;
- Appropriately balancing cost, reliability, and performance of the Rail Infrastructure; and
- Coordinating outages with other Supply Chain Participants wherever reasonably possible with a view to maximising throughput.

In doing so, Aurizon Network notes that some cost and scope variances do exist in comparison to the approved MSB for each Coal System. It should be noted that when developing the approved MSB, Aurizon Network is required to forecast maintenance scope and cost up to 18-months in advance of execution. A degree of variation is expected due to the dynamic nature of linear heavy haul Rail Infrastructure in which asset condition and criticality can change due to normal railway operations, meteorological and environmental factors and relative degradation rates.

1.2 FY23 Maintenance Costs Claim

Aurizon Network submits for QCA approval, its actual Direct Maintenance Costs incurred (**Maintenance Costs Claim**) for FY23. This Maintenance Costs Claim is consistent¹ with the FY23 maintenance costs that Aurizon Network communicated to Customers on:

¹ Some minor variances may exist due to rounding.

- 31 July 2023 as part of the RIG quarterly report for FY23 Q4; and
- 15 August 2023 as part of the Quarterly RIG Forum group presentation.

The FY23 MSB provided a total direct maintenance budget of \$156.8m for the CQCN. During FY23, Aurizon Network incurred total maintenance costs of \$165.5m.

Noting that UT5 provides Allowable Revenues and Reference Tariffs for coal traffic only, Aurizon Network has calculated an allocation of costs to non-coal train services and has deducted these amounts from this Maintenance Cost Claim. Aurizon Network has also excluded expenditure of approximately \$170,000, associated with the rectification of a weather-related track washout at Goodbye Creek Bridge (between Kaili and Wathana – a non-coal track section in the Newlands System).

The overall value of Aurizon Network's FY23 Maintenance Cost Claim for each Coal System are presented in Table 1 below.

Table 1 FY23 Maintenance Costs Incurred by Coal System

System	Approved Budget (\$m)	Maintenance Costs Incurred (\$m)	Deduction for Non-Coal (\$m)	Maintenance Cost Claim (\$m)
Blackwater	68.1	71.8	(0.7)	71.1
Goonyella	62.8	65.4	(0.1)	65.3
Moura	12.8	13.6	(0.1)	13.6
Newlands / GAPE	13.1	14.6	(0.2)	14.4
Total	156.8	165.5	(1.1)	164.3

Aurizon Network generally considers that the FY23 Maintenance Cost Claim for each Coal System meets the requirements of clause 7A.11.5(f) of UT5, is consistent with the Approved Maintenance Strategy and Budget, and as a result, should be approved.

Nevertheless, Aurizon Network was required to undertake increased levels of corrective maintenance during FY23 due to wet conditions experienced through the La Nina weather event in 2021, 2022 and 2023. The sustained nature of La Nina has not allowed the formation (soil) and fouled ballast to go through a normal wet/dry cycle. Consequently, the saturated ground conditions have contributed to an increase in track defects (such as mudholes) and the imposition of Temporary Speed Restrictions (TSR) to ensure safe operations in areas where track geometry requires rectification.

This increased the levels of corrective maintenance activity, restressing and support from external contractors has contributed to a \$1.9m overspend of the 'Other Civil Maintenance' category in the Blackwater System. This in turn saw the combination of 'other maintenance items'² for the Blackwater System, exceed the materiality threshold with an overall variance to budget of \$2.7m.

Aurizon Network confirms that there are no other items within the Maintenance Costs Claim for a Coal System that differ in a material respect (i.e. exceeding +/- \$2m) when compared to the corresponding item in the Approved Maintenance Strategy and Budget. Consequently, Aurizon Network considers that the QCA should approve the Maintenance Costs Claim for each Coal System.

² As outlined in section 2.1 below, it was agreed with the RIG that the Structures and Facilities, Trackside Systems, Other Civil Maintenance, Other General Maintenance categories are to be considered a single item.

1.3 Form of Submission

This submission outlines all matters that are relevant to the Maintenance Cost Claim and is structured as follows:

Section 2	Provides an overview of the Regulatory Process relevant to the QCA's assessment of Aurizon Network's Maintenance Costs Claim;
Section 3	Blackwater System Maintenance Cost Claim
Section 4	Goonyella System Maintenance Cost Claim
Section 5	Moura System Maintenance Cost Claim
Section 6	Newlands System and GAPE Maintenance Cost Claim
Section 7	Provides an overview of how Aurizon Network has sought to promote the UT5 Maintenance Objectives;
Section 8	Provides an overview of the procurement strategy and methodology used by Aurizon Network with respect to the Maintenance Work.

Aurizon Network has prepared detailed financial models (**the Models**) in support of this submission and has provided these to QCA staff in electronic form. The Models contain Confidential Information relating to individual Train Services and accordingly Aurizon Network requests that the Models are not published.

Please note that the tables included within this submission may not add due to rounding.

2. Overview of the Regulatory Process

Clause 7A.11.3 of UT5 provides a process through which Aurizon Network can seek pre-approval of its MSB for a Coal System for a Year. Upon approval of the MSB for each Coal System (either by a Special Majority of End Users via the RIG process or by the QCA), Aurizon Network will:

- give effect to the MSB for each Coal System by setting a forecast Maintenance Indicator for the forthcoming financial year as part of the Annual review of Reference Tariffs process (Clause 4 of Schedule F to UT5); and
- implement the approved MSB for each Coal System during the year.

Following the end of each financial year, Aurizon Network will submit its Maintenance Costs Claim to the QCA for approval in accordance with Clause 7A.11.5.

2.1 QCA assessment of the Maintenance Costs Claim

As outlined in clause 7A.11.5(f) of UT5, the QCA will determine the extent to which Aurizon Network's Maintenance Costs Claim is consistent with the Approved MSB for each Coal System, having regard to a materiality threshold of +/- \$2 million for a maintenance 'item'.

In this context, the term 'item' is not defined within UT5. As part of the FY21 MRSB process, it was agreed with the RIG that for the purpose of the QCA's assessment under clause 7A.11.5(f)(ii) of UT5, a maintenance 'item' is:

- For Blackwater and Goonyella, the product areas of Resurfacing, Rail Grinding, General Track Maintenance, 'Signalling and Telecoms' and Electrical should be considered as individual items. The remaining product areas should be considered a single item (Structures and Facilities, Trackage Systems, Other Civil Maintenance, Other General Maintenance); and
- For Moura and Newlands/GAPE, the maintenance budget in its entirety, should be considered an 'item'.

2.1.1 QCA process where there is no material difference

As specified in clause 7A.11.5(f)(i) to 7A.11.5(f)(ii)(A), where the Maintenance Costs Claim is consistent with the Approved MSB:

- End Users are deemed to support the relevant elements of the Maintenance Costs Claim; and
- the QCA will approve the Maintenance Costs Claim.

2.1.2 Approval process where a material difference exists

Where there is a difference in a material respect, the QCA will consider any item:

- which is at least \$2 million more than the corresponding item in the Approved MSB for a Coal System;
- which is at least \$2 million less than the corresponding item in the Approved MSB for a Coal System; or
- in the Approved MSB which has a value of at least \$2 million and which Aurizon Network has failed to undertake.

Members of the RIG may make submissions to the QCA to the extent the Maintenance Cost claim differs in a material respect from a Coal System's Approved MSB.

The QCA must approve costs that are different in a material respect to the extent those costs are prudent and efficient. In making its determination, the QCA may have regard to the Maintenance Objectives, which are outlined in Clause 7A.11.1(a)(iii)(A)-(C) and in section 1.1 above.

2.2 Reconciliation of approved maintenance costs

To the extent that the actual maintenance costs approved by the QCA under clause 7A.11.5 differs from the amounts recovered through Allowable Revenues and Reference Tariffs during the year, the Revenue Adjustment Amounts (Revenue Cap) process includes an adjustment under Schedule F, Clause 4.3 (c)(ii) to reconcile that difference.

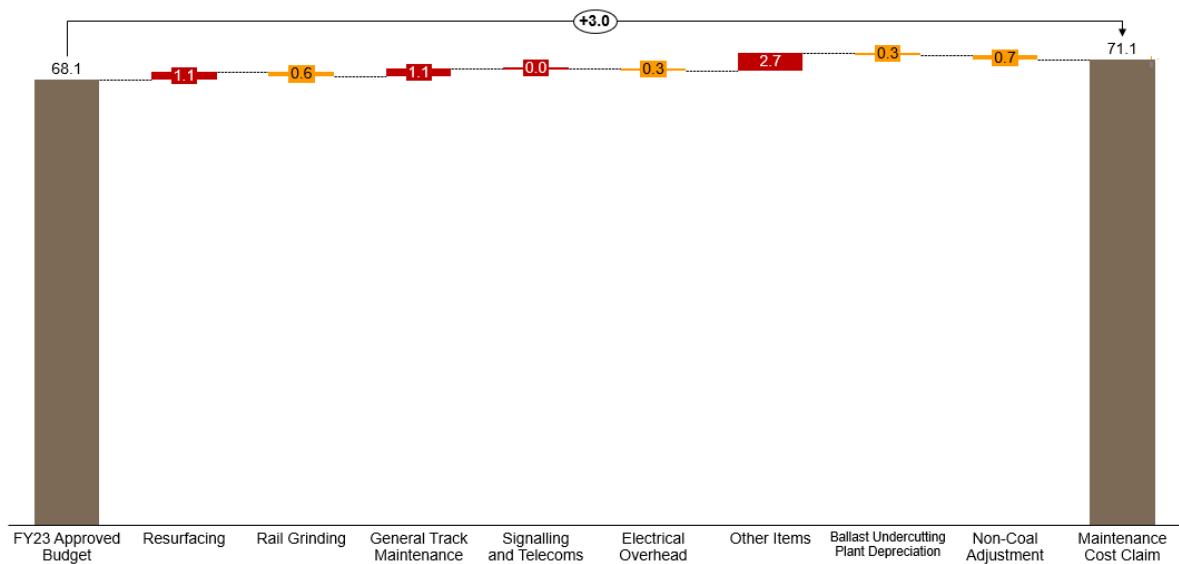
3. Blackwater System Maintenance Costs Claim

This section outlines the actual Direct Maintenance Costs that Aurizon Network incurred during FY23 in delivering Maintenance Work in the Blackwater System.

3.1 Direct Maintenance Cost Performance

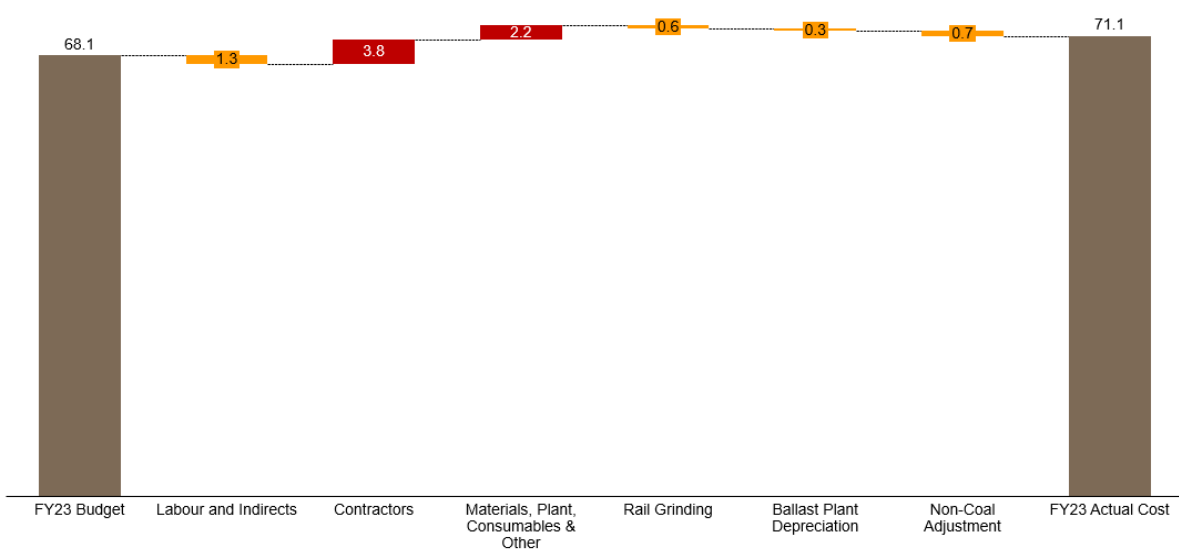
Aurizon Network submits for QCA approval, a Maintenance Cost Claim of \$71.1m, which in aggregate is \$3.0m higher than the approved maintenance budget of \$68.1m for this Coal System. This variance was driven by additional costs in the Other Civil Maintenance, Resurfacing and General Track Maintenance categories. Increases in these maintenance categories were partially offset by lower rail grinding and electrical maintenance costs.

Figure 1 Blackwater System Maintenance Costs Incurred (\$m)



Maintenance cost variances by cost category are summarised in Figure 2 below.

Figure 2 Blackwater System Maintenance Cost variance by cost category



The variance between the FY23 budget and Aurizon Network's actual costs is primarily driven by increased contractor costs in response to higher corrective maintenance activity levels in the Blackwater system. Aurizon Network uses contractors to support activities such as fire and vegetation management and minor undercutting activities, which fall within the General Track and Other Civil Maintenance categories. During FY23, Aurizon Network also observed material increases in the rates being charged by contractors for maintenance support services.

Securing and retaining skilled labour continues to remain challenging due to the high demand for qualified Electrical resources across the construction, mining, energy and rail sectors. Various mitigation strategies were implemented in H1 FY23 including engagement of contract labour support and the roll out of targeted trainee and apprenticeship programs, particularly for Electrical trades.

Aurizon Network has assessed its actual maintenance costs incurred against the Approved MSB, taking into consideration the materiality thresholds specified in UT5, 7A.11.5(f)(ii)(B).

Table 2 Maintenance cost materiality thresholds

Legend:	
Consistent	Variation from Approved MSB is within +/- \$2m materiality threshold.
Departed	Variation from Approved MSB exceeds +/- \$2m materiality threshold.

The following table outlines whether Aurizon Network has remained consistent with or has departed from the approved MSB. In assessing the Maintenance Costs Claim (as per clause 7A.11.5), the QCA should have regard to the maintenance items, represented by the shaded rows in Table 3 below.

Table 3 Blackwater System Maintenance Costs – Comparison to Approved Budget (\$m)

Maintenance Item (\$m)	Maintenance Costs Incurred	Approved Budget	Cost Variance	Consistent or Departed
Resurfacing	10.4	9.2	1.1	
<i>Mainline</i>	8.7	7.3		
<i>Turnout</i>	1.7	2.0		
Rail Grinding	8.1	8.6	(0.6)	
<i>Mainline</i>	■	■		
<i>Turnout</i>	■	■		
<i>Level Crossing</i>	■	■		
General Track Maintenance	23.7	22.6	1.1	
<i>General Track</i>	22.3	20.9		
<i>Track Recording</i>	0.9	1.1		
<i>Ultrasonic Testing</i>	0.5	0.5		
Signalling and Telecoms	10.2	10.2	0.0	
<i>Signalling Corrective</i>	2.5	2.6		
<i>Signalling Preventative</i>	5.4	5.4		
<i>Telecoms Corrective</i>	0.4	0.4		
<i>Telecoms Preventative</i>	1.9	1.8		
Electrical	5.8	6.1	(0.3)	
<i>OHLE Corrective</i>	1.7	2.0		

Maintenance Item (\$m)	Maintenance Costs Incurred	Approved Budget	Cost Variance	Consistent or Departed
<i>OHLE Preventative</i>	2.8	2.7		
<i>Power Systems Corrective</i>	0.7	0.6		
<i>Power Systems Preventative</i>	0.6	0.9		
Other Items	10.6	8.0	2.7	
<i>Structures and Facilities</i>	2.7	2.3		
<i>Trackside Systems</i>	0.9	0.8		
<i>Other Civil Maintenance</i>	4.2	2.4		
<i>Other General Maintenance</i>	2.8	2.5		
Sub-Total	68.8	64.8	4.1	
Ballast Undercutting Plant Depreciation	3.0	3.3	(0.3)	
Non-Coal Adjustment	(0.7)			
Maintenance Cost Claim	71.1	68.1	3.8	

3.2 Scope of Maintenance Work Undertaken

This section outlines the scope of Maintenance Work undertaken in the Blackwater Coal System during FY23.

Table 4 Blackwater System Scope Delivered

Maintenance Item	Scope Delivered	RIG Approved Scope	Scope Variance	% Variance
Resurfacing				
<i>Mainline</i>	944	896	48	5%
<i>Turnout</i>	180	173	7	4%
Rail Grinding				
<i>Mainline</i>	█	█	█	█
<i>Turnout</i>	█	█	█	█
<i>Level Crossing</i>	█	█	█	█
General Track Maintenance				
<i>Track Recording</i>	2,471	2,588	(117)	-5%
<i>Ultrasonic Testing</i>	5,224	5,344	(120)	-2%

3.3 Commentary on Maintenance Items

Aurizon Network has delivered Maintenance Work in the Blackwater System in a manner that is consistent with its legislative and regulatory obligations. By giving effect to the asset management

plans and strategies³ that underpinned the approved MSB, Aurizon Network has ensured compliance with these obligations.

As outlined in Table 3 above, a material variance exists in the 'Other Items' category, driven by increased 'Other Civil Maintenance' spend.

For all other categories within Aurizon Network's Maintenance Costs Claim for the Blackwater System, there is no material difference in comparison to the corresponding item in the approved MSB. Consequently, Aurizon Network considers that the QCA should approve the Blackwater Maintenance Costs Claim.

Aurizon Network has provided commentary on specific maintenance categories below.

3.3.1 Resurfacing

Full year resurfacing scope of works was broadly in line with the approved MSB.

- 944km of mainline resurfacing scope was completed during the year; 48km (5%) higher than the approved MSB; and
- 180 turnouts were resurfaced during the year; 7 (4%) more than the approved MSB.

Overall, resurfacing costs were \$1.1m (12%) higher than budget. Wet weather experienced during the year saw an increase in track geometry defects. This required additional resurfacing effort, resulting in increased labour and plant cost for the Blackwater System.

3.3.2 Rail Grinding

During FY23:

- █████ km of mainline rail grinding was completed, █████ km (██%) lower than the approved MSB;
- rail grinding was completed on █████ turnouts, █ (██%) less than the approved MSB; and
- rail grinding was completed on █████ level crossings, █ (██%) less than the approved MSB.

Rail Grinding costs were \$0.6m (-6%) lower than budget. The delivery of mainline rail grinding scope was impacted by:

- a planned reduction in scope between Raglan to Aldoga following a review of asset condition;
- a derailment at Marmor in Q3; and
- a machine breakdown and pathing availability in Q4 to facilitate Customer railings.

3.3.3 General Track Maintenance

Aurizon Network incurred \$23.7m for General Track Maintenance in the Blackwater System, which exceeded the approved MSB by \$1.1m (+5%) in aggregate.

This result was attributable to the completion of additional corrective maintenance activities including fire and vegetation management, embankment stabilisation, culvert clearing works and ballast profiling works, predominately driven by the extended wet season. These increases have been partially offset by reductions in level crossing maintenance and sleeper management spend, and a minor reduction in shift costs for Track Recording Car and Ultrasonic Testing.

³ The asset management plans and strategies are derived from Aurizon Network's Asset Maintenance and Renewal Policy, which in turn is the manifestation of Aurizon Network's practical application of the Safety Management System.

3.3.4 Signalling and Telecoms

Aurizon Network incurred \$10.2m in signalling and telecoms maintenance costs, which was broadly in line with the approved MSB.

3.3.5 Electrical

Aurizon Network incurred \$5.8m in electrical maintenance costs; representing an under-spend of \$0.3m (-5%) in aggregate when compared to the approved MSB.

The underspend was attributable to the completion of traction and overhead work during recovery efforts for the Marmor derailment⁴, which redirected resources away from the completion of maintenance activities at that time. This reduced the labour costs allocated to electrical maintenance activities.

3.3.6 Other Items

- Structures and Facilities Maintenance - Aurizon Network incurred \$2.7m in structures and facilities maintenance, representing an over-spend of \$0.4m when compared to the approved MSB. The over-spend was attributable to the completion of unplanned high priority works on the North Coast Line to remove a speed restriction, Clinton balloon & Central Line 5km culvert repairs, and Gogango Creek & 41 Mile Creek bridge repairs, which were completed earlier than expected to manage high risk deterioration. Full year costs were 16% above budget.
- Trackside Systems - full year spend in FY23 was \$0.1m above approved MSB; broadly in line with budget.
- Other Civil Maintenance - full year spend in FY23 exceeded the approved MSB by \$1.9m. 122 jobs were completed for the full year, representing a 13% (16 sites) increase on FY21 activity levels (which formed the basis of the FY23 MRSB forecast). The additional works related to minor undercutting and restressing to rectify top & line defects and remove TSRs resulting from ongoing wet weather conditions.

While the increase in the overall number of jobs completed contributed to the overspend relative to budget,⁵ the full year spend has also been impacted by a change to Aurizon Network's restressing policy. This change was implemented in FY22 to ensure a prompt and consistent approach to restress execution, which in turn would reduce the risk of derailment.⁶ In FY21, restressing was completed on approximately 10% of minor undercutting jobs. In comparison, the majority (c.90%) of minor undercutting jobs completed in FY23 required follow up restressing; a task which has been supported by external contractors.

Given the restressing policy change was implemented during FY22, costs associated with these additional works were not factored into the FY23 MSB.

- Other General Maintenance - Aurizon Network's full year spend was \$0.4m above the approved MSB, and attributable to additional on call and engineering support costs.

⁴ NB: costs associated with derailment recovery do not form part of this maintenance costs claim.

⁵ Noting that variability of scope and site conditions will also impact costs incurred year on year.

⁶ Aurizon Network's Track Stability Manual stipulates that any ballast disturbing works greater than 7m or 10 sleeper bays requires restressing to be undertaken. Prior to the change, undercutting activities performed under corrective maintenance were stress tested to determine whether a full restress was required to bring the rail back into alignment to pre ballast disturbing works levels.

3.3.7 Ballast Undercutting Plant Depreciation

Ballast undercutting plant depreciation was \$3.0m, which was \$0.3m lower than the approved MSB. The allocation of ballast undercutting plant depreciation between Coal Systems is aligned to scope delivery for the year.

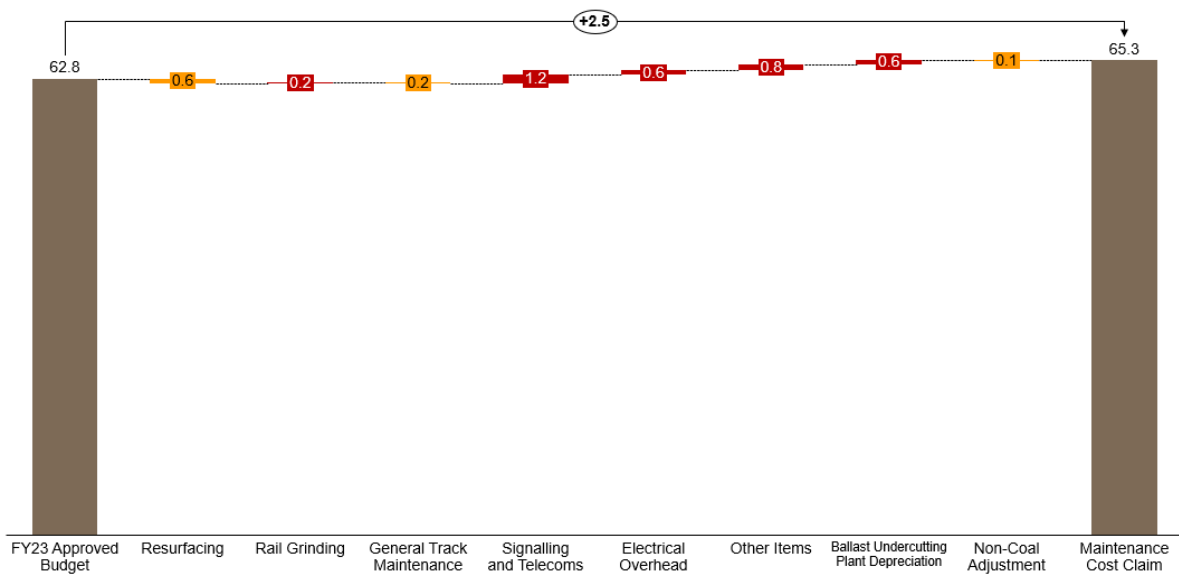
4. Goonyella System Maintenance Costs Claim

This section outlines the actual Direct Maintenance Costs that Aurizon Network incurred during FY23 in delivering Maintenance Work in the Goonyella System.

4.1 Direct Maintenance Cost Performance

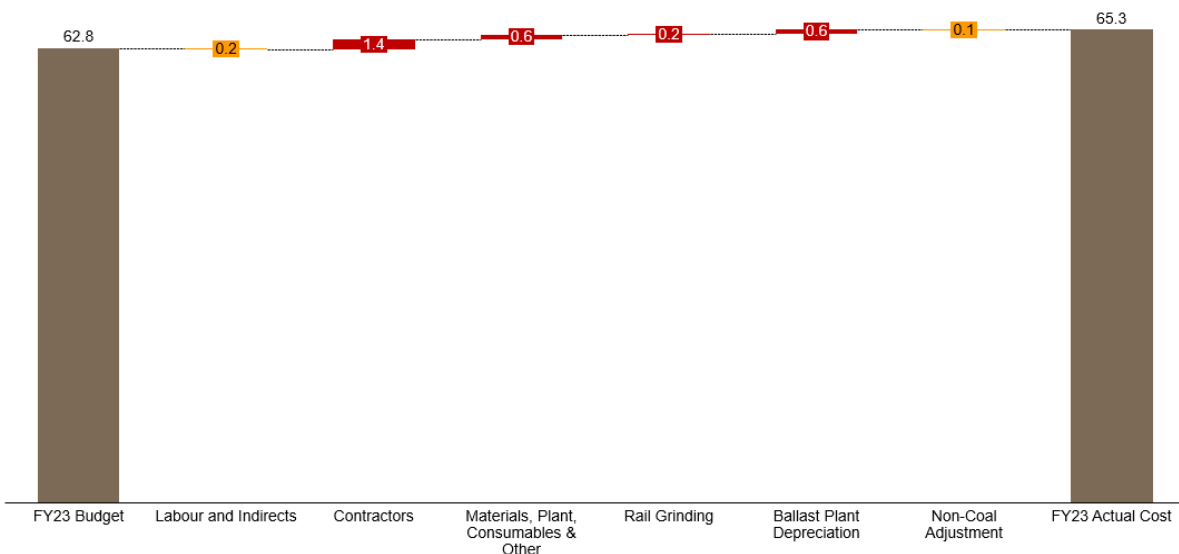
Aurizon Network submits for QCA approval, a Maintenance Cost Claim of \$65.3m, which in aggregate is \$2.5m higher than the approved maintenance budget of \$62.8m for this Coal System. This variance was primarily driven by additional Signalling and Telecoms maintenance, Electrical Overhead maintenance and the combined impact of other 'minor' maintenance activities. The increases in these items were partially offset by lower resurfacing and General Track maintenance costs.

Figure 3 Goonyella System Maintenance Costs Incurred (\$m)



Maintenance cost variances by cost category are summarised in Figure 4 below.

Figure 4 Goonyella System Maintenance Cost variance by cost category



The variance to budget was primarily driven by higher costs for external contractor support. Securing and retaining skilled labour continues to remain challenging due to the high demand for skilled Electrical resources across the construction, mining, energy and rail sectors. Various mitigation strategies have been implemented in H1 FY23 including engagement of contract labour support and the roll out of targeted trainee and apprenticeship programs, particularly for Electrical trades to support the Control Systems and Traction teams deliver the Signalling and Electrical maintenance program.

Higher contractor costs are driven by higher levels of corrective maintenance activity and higher rates being charged by contractors for maintenance support services. Aurizon Network uses contractors to support activities such as fire and vegetation management, drainage rectification works and minor undercutting activities, which fall within the General Track and Other Civil Maintenance categories.

Aurizon Network also incurred higher levels of cost escalation than was assumed in the FY23 MRSB with increases in the cost of materials (rail, sleepers, quarried materials (ballast) & electronics) used in operations.

Aurizon Network has assessed its actual maintenance costs incurred against the Approved MSB, taking into consideration the materiality thresholds specified in UT5, 7A.11.5(f)(ii)(B).

Table 5 Maintenance cost materiality thresholds

Legend:	
Consistent	Variation from Approved MSB is within +/- \$2m materiality threshold.
Departed	Variation from Approved MSB exceeds +/- \$2m materiality threshold.

The following table outlines whether Aurizon Network has remained consistent with or has departed from the approved MSB. In assessing the Maintenance Costs Claim (as per clause 7A.11.5), the QCA should have regard to the maintenance items, represented by the shaded rows in Table 6 below.

Table 6 Goonyella System Maintenance Costs – Comparison to Approved Budget (\$m)

Maintenance Item (\$m)	Maintenance Costs Incurred	Approved Budget	Cost Variance	Consistent or Departed
Resurfacing	9.3	9.9	(0.6)	
<i>Mainline</i>	7.5	7.8		
<i>Turnout</i>	1.8	2.1		
Rail Grinding	9.3	9.1	0.2	
<i>Mainline</i>	■	■		
<i>Turnout</i>	■	■		
<i>Level Crossing</i>	■	■		
General Track Maintenance	16.2	16.4	(0.2)	
<i>General Track</i>	14.8	14.9		
<i>Track Recording</i>	0.8	0.9		
<i>Ultrasonic Testing</i>	0.5	0.6		
Signalling and Telecoms	11.2	10.0	1.2	
<i>Signalling Corrective</i>	3.7	2.9		
<i>Signalling Preventative</i>	4.7	4.3		
<i>Telecoms Corrective</i>	0.3	0.3		

Maintenance Item (\$m)	Maintenance Costs Incurred	Approved Budget	Cost Variance	Consistent or Departed
<i>Telecoms Preventative</i>	2.5	2.5		
Electrical	6.7	6.2	0.6	
<i>OHLE Corrective</i>	2.8	2.3		
<i>OHLE Preventative</i>	2.2	2.4		
<i>Power Systems Corrective</i>	0.9	0.2		
<i>Power Systems Preventative</i>	0.9	1.2		
Other Items	9.5	8.7	0.8	
<i>Structures and Facilities</i>	2.0	2.0		
<i>Trackside Systems</i>	1.7	1.7		
<i>Other Civil Maintenance</i>	3.8	2.6		
<i>Other General Maintenance</i>	1.9	2.4		
Sub-Total	62.2	60.2	2.0	
Ballast Undercutting Plant Depreciation	3.2	2.6	0.6	
Non-Coal Adjustment	(0.1)		--	
Maintenance Cost Claim	65.3	62.8	2.6	

4.2 Scope of Maintenance Work Undertaken

This section outlines the scope of Maintenance Work undertaken in the Goonyella Coal System during FY23.

Table 7 Goonyella System Scope Delivered

Maintenance Item	Scope Delivered	RIG Approved Scope	Scope Variance	% Variance
Resurfacing				
<i>Mainline</i>	808	956	(148)	-16%
<i>Turnout</i>	189	189	--	0%
Rail Grinding				
<i>Mainline</i>	█	█	█	█
<i>Turnout</i>	█	█	█	█
<i>Level Crossing</i>	█	█	█	█
General Track Maintenance				
<i>Track Recording</i>	1,899	1,809	90	5%
<i>Ultrasonic Testing</i>	5,188	5,729	(541)	-9%

4.3 Commentary on annual performance for Maintenance Items

Aurizon Network has delivered Maintenance Work in the Goonyella System in a manner that is consistent with its legislative and regulatory obligations. By giving effect to the asset management

plans and strategies⁷ that underpinned the approved MSB, Aurizon Network has ensured compliance with these obligations.

There are no categories of maintenance within Aurizon Network's Maintenance Costs Claim for the Goonyella System, with a difference in a material respect when compared to the corresponding item in the approved MSB. Consequently, Aurizon Network considers that the QCA should approve the Goonyella Maintenance Costs Claim.

Aurizon Network has provided some commentary on specific maintenance categories below.

4.3.1 Resurfacing

During FY23, Aurizon Network:

- delivered 808km of mainline resurfacing scope, which was 148km lower (-16%) than the approved MSB of 956km; and
- resurfaced 189 turnouts, which was in line with the approved MSB.

Aurizon Network's total costs for the year were \$0.6m (-6%) lower than the approved MSB of \$9.9m. Scope delivery was impacted by wet conditions, particularly in Q2 and Q3, which resulted in slower than expected production rates.

4.3.2 Rail Grinding

During FY23, Aurizon Network delivered:

- █████ km of mainline rail grinding was completed; an additional █████ km (████%);
- rail grinding was completed on █████ turnouts; █████ fewer (████%) than the MSB; and
- rail grinding was completed on █████ level crossings; █████ fewer (████%) than the MSB.

Overall rail grinding spend was \$0.2m (+2%) higher than the approved MSB. Additional mainline grinding scope was completed at Coppabella Yard, Lake Vermont fork and balloon, and Coppabella to Wotonga Up and Down roads. Some turnout grinding scope was deferred following the Marmor derailment, where machines were unable to pass the derailment site.

4.3.3 General Track Maintenance

Aurizon Network incurred costs materially in line with the approved MSB for General Track Maintenance; representing an under-spend of \$0.2m (-1%) in aggregate. This result can be attributable to lower than expected spend in access road maintenance, top & line spot resurfacing, fencing and track recording car costs.

4.3.4 Signalling and Telecoms

Aurizon Network incurred \$11.2m in signalling and telecoms maintenance costs; representing an over-spend of \$1.2m (+12%) when compared to the approved MSB.

The additional spend for this item was predominately driven by additional contract labour spend to support trade/apprentice ratios and minor variations to labour allocation activity mix.

⁷ The asset management plans and strategies are derived from Aurizon Network's Asset Maintenance and Renewal Policy, which in turn is the manifestation of Aurizon Network's practical application of the Safety Management System.

4.3.5 Electrical

Aurizon Network incurred \$6.7m in electrical maintenance costs; representing an over-spend of \$0.6m (+9%) when compared to the approved MSB.

The overspend relative to budget was primarily attributable to resourcing changes. Additional contractor support was required to support skill shortages and apprentice/trade ratios.

4.3.6 Other Items

Spend on Structures and Facilities, Trackside Systems, Other Civil Maintenance and Other General Maintenance was \$0.8m (+9%) higher than the MSB.

This outcome was driven by an overspend in Other Civil Maintenance, where additional minor undercutting and restressing works were required to mitigate wet weather-related defects. Aurizon Network sought to mitigate the impact of this overspend by packaging works, leading to a reduction in contractor costs.

A reduction in inventory management costs saw a reduction in 'Other General Maintenance' spend relative to budget.

4.3.7 Ballast Undercutting Plant Depreciation

Ballast undercutting plant depreciation was \$3.2m, which was \$0.6m higher than the approved MSB. The allocation of ballast undercutting plant depreciation between Coal Systems is aligned to scope delivery for the year.

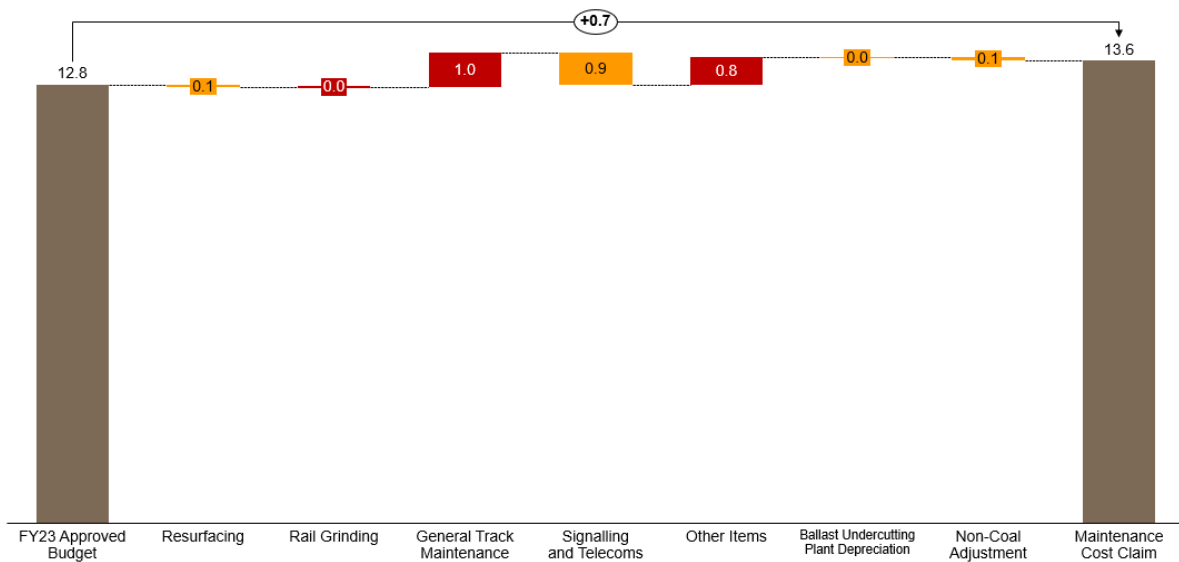
5. Moura System Maintenance Costs Claim

This section outlines the actual Direct Maintenance Costs that Aurizon Network incurred during FY23 in delivering Maintenance Work in the Moura System.

5.1 Direct Maintenance Cost Performance

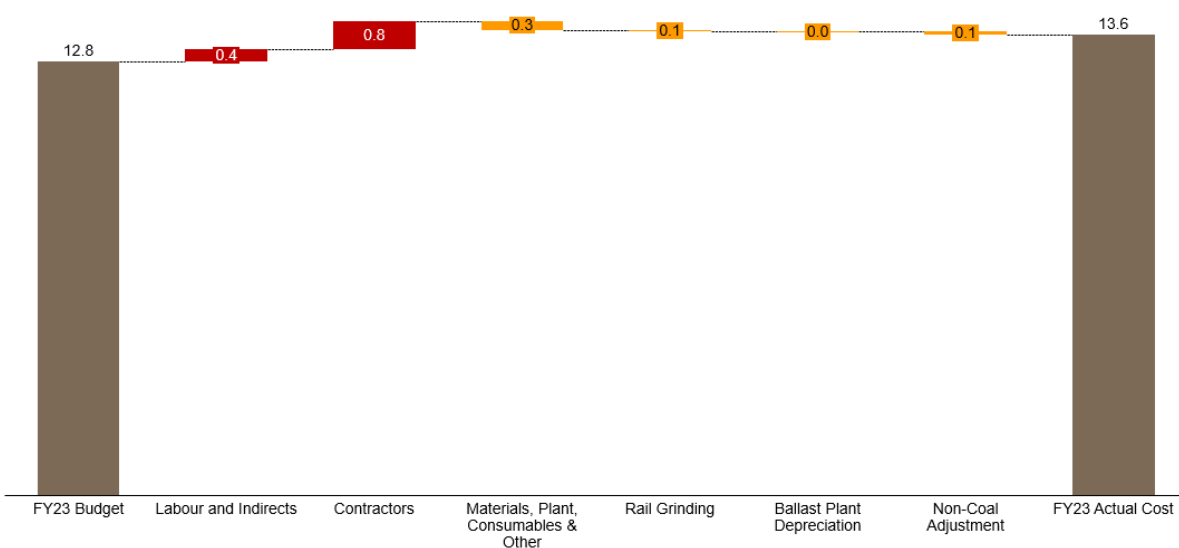
Aurizon Network submits for QCA approval, a Maintenance Cost Claim of \$13.6m, which in aggregate is \$0.7m higher than the approved maintenance budget of \$12.8m for this Coal System. This variance was primarily driven by additional General Track Maintenance costs and the combined impact of other 'minor' maintenance activities. These cost increases were partially offset by lower Signalling and Telecoms, and Resurfacing costs.

Figure 5 Moura System Maintenance Costs Incurred (\$m)



Maintenance cost variances by cost category are summarised in Figure 6 below.

Figure 6 Moura System Maintenance Cost variance by cost category



The variance to budget was primarily due to higher corrective maintenance activity, particularly within the General Track and Other Civil Maintenance categories. These corrective maintenance activities are executed by both internal and external resources. Aurizon Network uses contractors to support activities such as fire and vegetation management, drainage rectification works and minor undercutting activities, which fall within the General Track and Other Civil Maintenance categories. As is the case in other systems, Aurizon Network has seen higher rates being charged by contractors for maintenance support services.

Aurizon Network has assessed its actual maintenance costs incurred against the Approved MSB, taking into consideration the materiality thresholds specified in UT5, 7A.11.5(f)(ii)(B).

Table 8 Maintenance cost materiality thresholds

Legend:	
Consistent	Variation from Approved MSB is within +/- \$2m materiality threshold.
Departed	Variation from Approved MSB exceeds +/- \$2m materiality threshold.

The following table outlines whether Aurizon Network has remained consistent with or has departed from the approved MSB. In assessing the Maintenance Costs Claim (as per clause 7A.11.5) for the Moura System, the QCA should have regard to the total maintenance budget in aggregate, as outlined in Table 9 below.

Table 9 Moura System Maintenance Costs – Comparison to Approved Budget (\$m)

Maintenance Item (\$m)	Maintenance Costs Incurred	Approved Budget	Cost Variance	Consistent or Departed
Resurfacing	1.4	1.5	(0.1)	
<i>Mainline</i>	1.3	1.4		
<i>Turnout</i>	0.1	0.1		
Rail Grinding	0.4	0.4	0.0	
<i>Mainline</i>	■	■		
<i>Turnout</i>	■	■		
<i>Level Crossing</i>	■	■		
General Track Maintenance	6.3	5.3	1.0	
<i>General Track</i>	6.1	5.1		
<i>Track Recording</i>	0.2	0.2		
<i>Ultrasonic Testing</i>	0.0	0.0		
Signalling and Telecoms	2.1	3.0	(0.9)	
<i>Signalling Corrective</i>	0.8	1.1		
<i>Signalling Preventative</i>	0.9	1.3		
<i>Telecoms Corrective</i>	0.1	0.1		
<i>Telecoms Preventative</i>	0.3	0.5		
Other Items	3.4	2.6	0.8	
<i>Structures and Facilities</i>	1.0	1.0		
<i>Trackside Systems</i>	0.3	0.3		
<i>Other Civil Maintenance</i>	1.9	0.9		

Maintenance Item (\$m)	Maintenance Costs Incurred	Approved Budget	Cost Variance	Consistent or Departed
<i>Other General Maintenance</i>	0.2	0.5		
Sub-Total	13.6	12.8	0.8	
Ballast Undercutting Plant Depreciation	--	--	--	
Non-Coal Adjustment	(0.1)		--	
Maintenance Cost Claim	13.6	12.8	0.8	

5.2 Scope of Maintenance Work Undertaken

This section outlines the scope of Maintenance Work undertaken in the Moura Coal System during FY23.

Table 10 Moura System Scope Delivered

Maintenance Item	Scope Delivered	RIG Approved Scope	Scope Variance	% Variance
Resurfacing				
<i>Mainline</i>	183	170	13	8%
<i>Turnout</i>	18	10	8	80%
Rail Grinding				
<i>Mainline</i>	■	■	■	■
<i>Turnout</i>	■	■	■	■
<i>Level Crossing</i>	■	■	■	■
General Track Maintenance				
<i>Track Recording</i>	492	514	(22)	-4%
<i>Ultrasonic Testing</i>	396	382	14	4%

5.3 Commentary on annual performance for Maintenance Items

Aurizon Network has delivered Maintenance Work in the Moura System in a manner that is consistent with its legislative and regulatory obligations. By giving effect to the asset management plans and strategies⁸ that underpinned the approved MSB, Aurizon Network has ensured compliance with these obligations.

There are no categories of maintenance within Aurizon Network's Maintenance Costs Claim for the Moura System, with a difference in a material respect when compared to the corresponding item in the approved MSB. Consequently, Aurizon Network considers that the QCA should approve the Moura Maintenance Costs Claim.

Aurizon Network has provided some commentary on specific maintenance categories below.

⁸ The asset management plans and strategies are derived from Aurizon Network's Asset Maintenance and Renewal Policy, which in turn is the manifestation of Aurizon Network's practical application of the Safety Management System.

5.3.1 Resurfacing

Aurizon Network delivered the resurfacing scope of works as outlined in the approved MSB. Scope completed for:

- Mainline resurfacing was higher than the approved MSB with 183km completed. This represents an additional 13km (+8%); and
- Turnout resurfacing was also higher than approved MSB with 18 turnouts completed, compared to a budgeted scope of 10 (+80%).

Despite the additional scope, Aurizon Network's costs were approximately \$0.1m lower than budget. Additional resurfacing scope was delivered during the year in response to track condition. A variation in the phasing of plant maintenance activities did result in a reduction in costs relative to budget.

5.3.2 Rail Grinding

During FY23, Aurizon Network completed:

- ■ km of mainline rail grinding; ■ km (■%) less than the approved MSB;
- rail grinding on ■ turnouts, consistent with the MSB; and
- rail grinding on ■ level crossings; ■ more than the MSB (■%).

Total rail grinding costs incurred were materially in line with budget.

5.3.3 General Track Maintenance

Aurizon Network incurred costs in excess of the approved MSB for General Track Maintenance; representing an over-spend of \$1.0m (+19%) in aggregate.

This outcome was driven by additional internal resources and contract support required to undertake additional Fencing, Fire & Vegetation Management activities, Top & Line Spot Resurfacing, Rail Repair and Level Crossing Maintenance. The additional corrective maintenance requirements and spend were predominately driven by the extended wet season.

5.3.4 Signalling and Telecoms

Aurizon Network incurred \$2.1m in signalling and telecoms maintenance costs; representing an under-spend of \$0.9m (-31%) in aggregate when compared to the approved MSB.

While Aurizon Network saw additional spend in contract labour costs to support trade/apprentice ratios, the MRSB made provision for additional external support costs which were not required. This was the main driver of the lower cost for the materials, plant and consumables category.

5.3.5 Other Items

Spend on Structures and Facilities, Trackside Systems, Other Civil Maintenance and Other General Maintenance was \$0.8m (+30%) higher than the MSB.

This over-spend was attributable to the Other Civil Maintenance category, where ongoing wet weather resulted in additional track defects that required minor undercutting works to remedy.

6. Newlands System and GAPE Maintenance Costs Claim

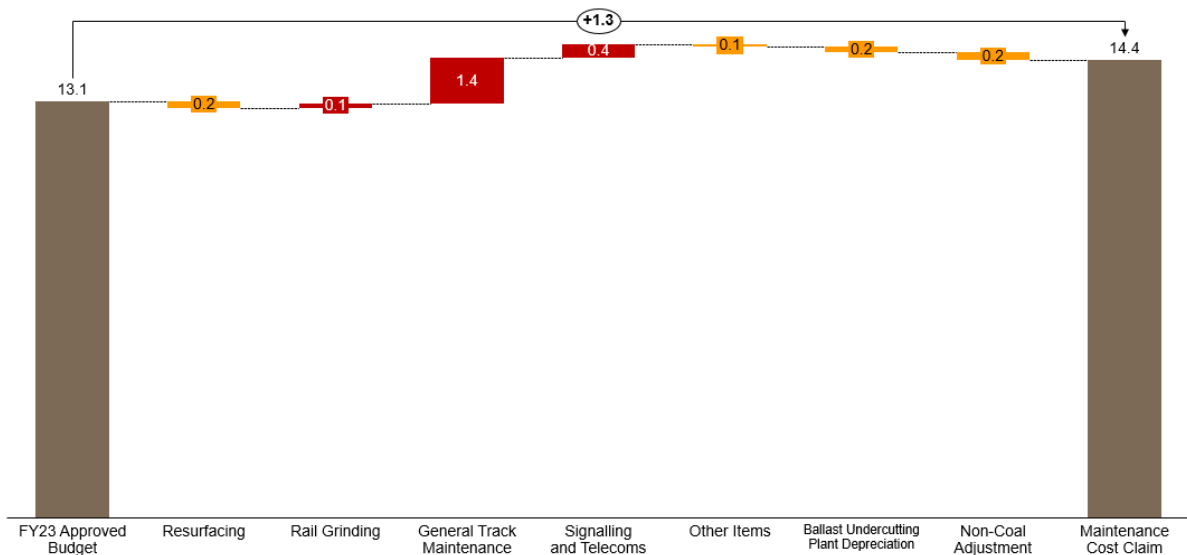
This section outlines the actual Direct Maintenance Costs that Aurizon Network incurred during FY23 in delivering Maintenance Work in the Newlands System and GAPE.

6.1 Direct Maintenance Cost Performance

Aurizon Network submits for QCA approval, a Maintenance Cost Claim of \$14.4m, which in aggregate is \$1.3m higher than the approved maintenance budget of \$13.1m for this Coal System. This variance was primarily driven by additional General Track Maintenance and Signalling and Telecoms costs, which were partially offset by lower resurfacing costs.

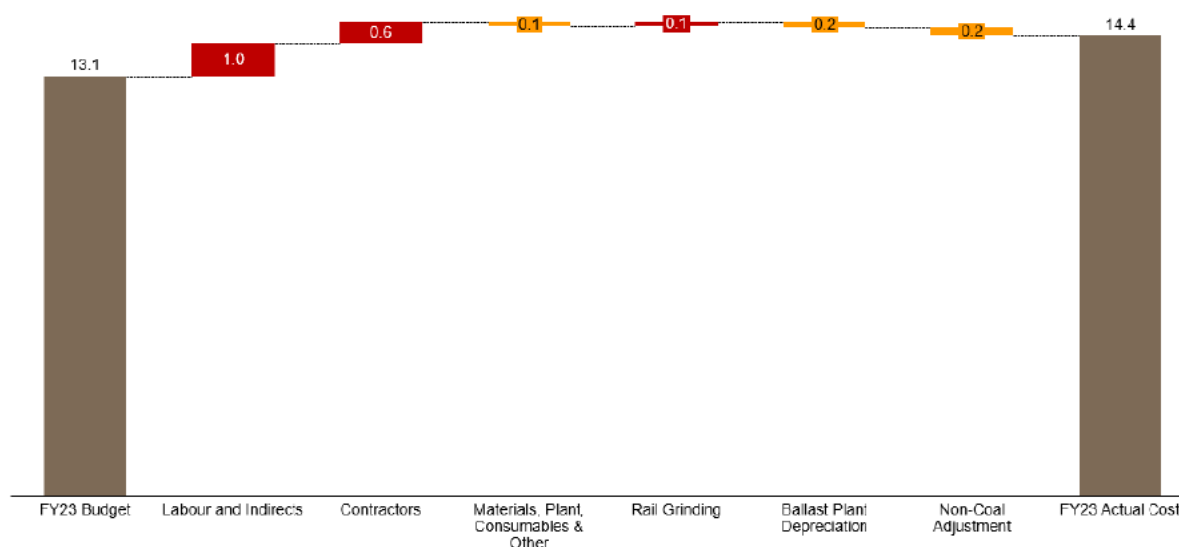
As highlighted in section 1.2 above, Aurizon Network has removed approximately \$0.2m from its Maintenance Cost Claim for the Newlands System, noting that these costs relate to wash-out rectification work on non-coal rail infrastructure.

Figure 7 Newlands System and GAPE Maintenance Costs Incurred (\$m)



Maintenance cost variances by cost category are summarised in Figure 8 below.

Figure 8 Newlands System Maintenance Cost variance by cost category



The variance was primarily driven by higher costs for both internal resources and external contractor support.

Securing and retaining skilled labour continues to remain challenging due to the high demand for electrical resources across the construction, mining, energy and rail sectors. Various mitigation strategies have been implemented in H1 FY23 including engagement of contract labour support and the roll out of targeted trainee and apprenticeship programs, particularly for Electrical trades to support the Control Systems teams to deliver the Signalling maintenance program.

Higher contractor costs are driven by higher levels of corrective maintenance activity and higher rates being charged by contractors for maintenance support services. Aurizon Network uses contractors to support activities such as fire and vegetation management, drainage rectification works and minor undercutting activities, which fall within the General Track and Other Civil Maintenance categories.

Aurizon Network has assessed its actual maintenance costs incurred against the Approved MSB, taking into consideration the materiality thresholds specified in UT5, 7A.11.5(f)(ii)(B).

Table 11 Maintenance cost materiality thresholds

Legend:	
Consistent	Variation from Approved MSB is within +/- \$2m materiality threshold.
Departed	Variation from Approved MSB exceeds +/- \$2m materiality threshold.

The following table outlines whether Aurizon Network has remained consistent with or has departed from the approved MSB. In assessing the Maintenance Costs Claim (as per clause 7A.11.5) for the Newlands System and GAPE, the QCA should have regard to the total maintenance budget in aggregate, as outlined in Table 12 below.

Table 12 Newlands System and GAPE Maintenance Costs – Comparison to Approved Budget (\$m)

Maintenance Item (\$m)	Maintenance Costs Incurred	Approved Budget	Cost Variance	Consistent or Departed
Resurfacing	1.6	1.8	(0.2)	
<i>Mainline</i>	<i>1.4</i>	<i>1.5</i>		
<i>Turnout</i>	<i>0.2</i>	<i>0.2</i>		

Maintenance Item (\$m)	Maintenance Costs Incurred	Approved Budget	Cost Variance	Consistent or Departed
Rail Grinding	1.8	1.7	0.1	
<i>Mainline</i>	■	■		
<i>Turnout</i>	■	■		
<i>Level Crossing</i>	■	■		
General Track Maintenance	5.4	3.9	1.4	
<i>General Track</i>	5.0	3.7		
<i>Track Recording</i>	0.2	0.2		
<i>Ultrasonic Testing</i>	0.2	0.1		
Signalling and Telecommunications	3.2	2.8	0.4	
<i>Signalling Corrective</i>	1.3	0.8		
<i>Signalling Preventative</i>	1.3	1.5		
<i>Telecoms Corrective</i>	0.1	0.1		
<i>Telecoms Preventative</i>	0.6	0.4		
Other Items	2.6	2.7	(0.1)	
<i>Structures and Facilities</i>	1.5	1.3		
<i>Trackside Systems</i>	0.3	0.3		
<i>Other Civil Maintenance</i>	0.3	0.2		
<i>Other General Maintenance</i>	0.5	0.9		
Sub-Total	14.6	12.9	1.7	
Ballast Undercutting Plant Depreciation	–	0.2	(0.2)	
Non-Coal Adjustment	(0.2)		(0.2)	
Maintenance Cost Claim	14.4	13.1	1.4	

6.2 Allocation of costs between Newlands and GAPE

Consistent with the approach outlined in the FY23 MSB, Aurizon Network has allocated the Maintenance Cost Claim between the Newlands System and GAPE in proportion to the GTK for Newlands and GAPE Train Services that railed during FY23. GTK for GAPE Train Services is measured from North Goonyella Junction to Abbot Point. This results in the following outcomes:

Table 13 Maintenance Cost Allocation to Newlands and GAPE

System	FY23 MRSB	Maintenance Costs Incurred	Non-Coal Adjustment	Maintenance Cost Claim
Newlands	4.3	6.9	(0.1)	6.8
GAPE	8.9	7.7	(0.1)	7.6
Total	13.1	14.6	(0.2)	14.4

6.3 Scope of Maintenance Work Undertaken

This section outlines the scope of Maintenance Work undertaken in the Newlands System and GAPE during FY23.

Table 14 Newlands System and GAPE Scope Delivered

Maintenance Item	Scope Delivered	RIG Approved Scope	Scope Variance	% Variance
Resurfacing				
<i>Mainline</i>	179	188	(9)	-5%
<i>Turnout</i>	20	21	(1)	-5%
Rail Grinding				
<i>Mainline</i>	■	■	■	■
<i>Turnout</i>	■	■	■	■
<i>Level Crossing</i>	■	■	■	■
General Track Maintenance				
<i>Track Recording</i>	610	521	89	17%
<i>Ultrasonic Testing</i>	1,656	918	738	80%

6.4 Commentary on annual performance for Maintenance Items

Aurizon Network has delivered Maintenance Work in the Newlands System and GAPE in a manner that is consistent with its legislative and regulatory obligations. By giving effect to the asset management plans and strategies⁹ that underpinned the approved MSB, Aurizon Network has ensured compliance with these obligations.

There are no categories of maintenance within Aurizon Network's Maintenance Costs Claim for the Newlands System and GAPE, with a difference in a material respect when compared to the corresponding item in the approved MSB. Consequently, Aurizon Network considers that the QCA should approve the Newlands Maintenance Costs Claim.

Aurizon Network has provided some commentary on specific maintenance categories below.

6.4.1 Resurfacing

The resurfacing scope of works delivered was materially in line with the approved MSB.

- Mainline resurfacing was lower than the approved MSB with 179km (-5%) completed; 9km lower than the MSB; and
- Aurizon Network completed resurfacing on 20 turnouts, 1 (-5%) fewer than the MSB.

Aurizon Network delivered the resurfacing scope for \$1.6m, which was \$0.2m (-12%) lower than the approved MSB.

⁹ The asset management plans and strategies are derived from Aurizon Network's Asset Maintenance and Renewal Policy, which in turn is the manifestation of Aurizon Network's practical application of the Safety Management System.

These savings were attributable to the majority of scope being planned and executed within system and branch closures providing the team with dedicated and guaranteed track access allowing the scope to be completed in less time and at a lower cost.

6.4.2 Rail Grinding

The scope of rail grinding works delivered was materially in line with the approved MSB.

- ■ km of mainline rail grinding was completed; ■ km (■ %) higher less than the approved MSB;
- rail grinding was completed on ■ turnouts; ■ fewer (■ %) than the approved MSB; and
- in line with the MSB, rail grinding was completed on ■ level crossings.

Total rail grinding costs incurred were \$0.1m higher than budget.

6.4.3 General Track Maintenance

Aurizon Network incurred costs in excess of the approved MSB for General Track Maintenance; representing an over-spend of \$1.4m (+37%) in aggregate.

This over-spend was attributable to additional corrective maintenance activities relating to fire and vegetation management predominately driven by the extended wet season, and track inspection activities. Aurizon Network also saw increased spend on in top and line spot resurfacing for holding works ahead of planned formation repairs and increases in maintenance ballast activities in response to asset condition.

6.4.4 Signalling and Telecoms

Aurizon Network incurred \$3.2m in signalling and telecoms maintenance costs; representing an over-spend of \$0.4m (15%) in aggregate when compared to the approved MSB.

The increased expenditure was driven by the impact of additional contract labour costs to support critical skills shortages, trade/apprentice ratios and an increase in telecommunications maintenance costs.

6.4.5 Other Items

Spend on Structures and Facilities, Trackside Systems, Other Civil Maintenance and Other General Maintenance was \$0.1m (-2%) lower than the MSB.

6.4.6 Non-coal Allocation

During FY23, Aurizon Network incurred costs of approximately \$0.2m to rectify a track washout at Goodbye Creek Bridge - Kaili to Wathana due to a significant rain event in January 23. This section of track is not utilised by coal train services, and as a result, these costs have been removed from the FY23 Maintenance Costs Claim.

7. Consistency with the Maintenance Objectives

Operational performance outcomes are determined by a range of inter-related factors. An effective and efficient maintenance regime is a key enabler for operational performance. In delivering maintenance and asset renewal activity in each Coal System, Aurizon Network has had regard to the Maintenance Objectives outlined in Clause 7A.11.1. Specifically, Aurizon Network has:

- sought to ensure that Committed Capacity is delivered;
- appropriately balanced cost, reliability, and performance of the Rail Infrastructure; and
- wherever reasonably possible, coordinated outages with other Supply Chain Participants with a view to maximising throughput.

In line with our commitment to continuous improvement, Aurizon Network seeks to identify, trial, and implement various initiatives with the objective of improving the delivery of the maintenance and/or renewal programs. Table 15 provides examples to illustrate how Aurizon Network is seeking to promote the Maintenance Objectives in each Coal System through its Continuous Improvement Program.

Please note that some of the examples outlined below are relevant to multiple Coal Systems.

Table 15 Examples of Aurizon Network's actions to promote the Maintenance Objectives

Initiative	Description
Vacuum Truck Contractor	<ul style="list-style-type: none"> • Aurizon Network engaged a vacuum truck contractor for a 12-month period to remove coal build up in Callemondah yard and Gladstone port areas. • This activity has been operational since February 23, with work taking place between trains to avoid impacting revenue services. • Early results indicate an improvement in related operational metrics, including reductions in: <ul style="list-style-type: none"> – train delays, which have reduced from a historical average of ~4 hours per month to ~1 hour per month; – train cancellations (currently Nil compared to a historical value of ~7 cancellations per year); and – callouts for Civil teams outside of rostered hours (currently Nil compared to a historical value of ~22 callouts per year).
Vendor review – Mechanised Production plant maintenance	<ul style="list-style-type: none"> • During H2 FY23 a review of vendors was undertaken in the Mechanised Production business, primarily focusing in the plant maintenance area. • Several improvements were identified to improve cost competitiveness and service levels including: <ul style="list-style-type: none"> – Consolidation and reduction in the number of vendors; – Increased use of local vendors to reduce travel and accommodation costs; and – Upskilling internal resources / utilise internal skillsets to undertake routine and specialised services.
ATIS	<ul style="list-style-type: none"> • Ongoing development and delivery of the Automated Track Inspection System (ATIS), which comprises three rail infrastructure asset condition monitoring technologies mounted on revenue-service locomotives, including: <ul style="list-style-type: none"> – Track Geometry Measurement System - measures track geometry condition; – Wire Geometry Measurement System - measures the alignment of overhead wire relative to track position; and – Pantograph Collision Detection System – measuring the interface between the pantograph and the overhead wire.

Initiative	Description
	<ul style="list-style-type: none"> The ongoing deployment of ATIS provides asset condition data that assists with the early identification of asset condition issues and allows for timely intervention and rectification. This information was previously collected by a dedicated track recording vehicle, and Aurizon Network expects to realise modest capacity benefits by mounting the ATIS systems on revenue-service locomotives.

To support the QCA's prudence and efficiency assessment of maintenance costs, Aurizon Network has provided a summary of key operational performance data. The intent of providing this information is to illustrate how Aurizon Network's maintenance performance is helping to realise the Maintenance Objectives.

7.1 Below Rail Cancellations

Below rail cancellation trends provide an indication of how the network's performance impacts train operations. They can also be an early indicator of whether the maintenance and renewals investment is set at the right level.

As illustrated in Table 16, Below Rail cancellations (expressed as a proportion of agreed services) represent a low proportion of overall cancellations the FY23.

Table 16 Below Rail Cancellation % - FY23 vs FY22

System	FY23	FY22	Variance
Blackwater	2.3%	1.1%	▲
Goonyella	2.6%	2.6%	--
Moura	1.6%	4.6%	▼
Newlands / GAPE	1.7%	1.8%	▼

At an individual system level, FY23 saw the below rail cancellation % increase in Blackwater but reduce in Moura and Newlands/GAPE relative to FY22. Aurizon Network notes that a prolonged period of significantly above-average rainfall (October 21 – March 23) was the key contributing factor to the deterioration in Blackwater System. Adverse weather impacted asset condition (especially civil assets), leading to higher levels of delays and cancellations.

The graphs below illustrate the number of cancellations by cause for the last 12 months.

Figure 9 Blackwater System – Cancellations

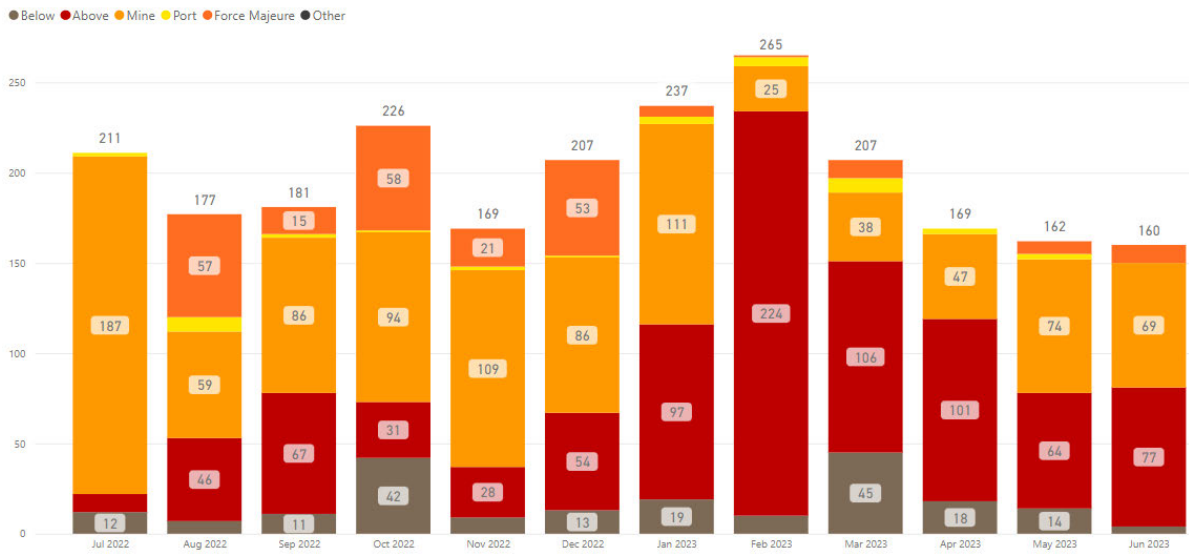


Figure 10 Goonyella System – Cancellations

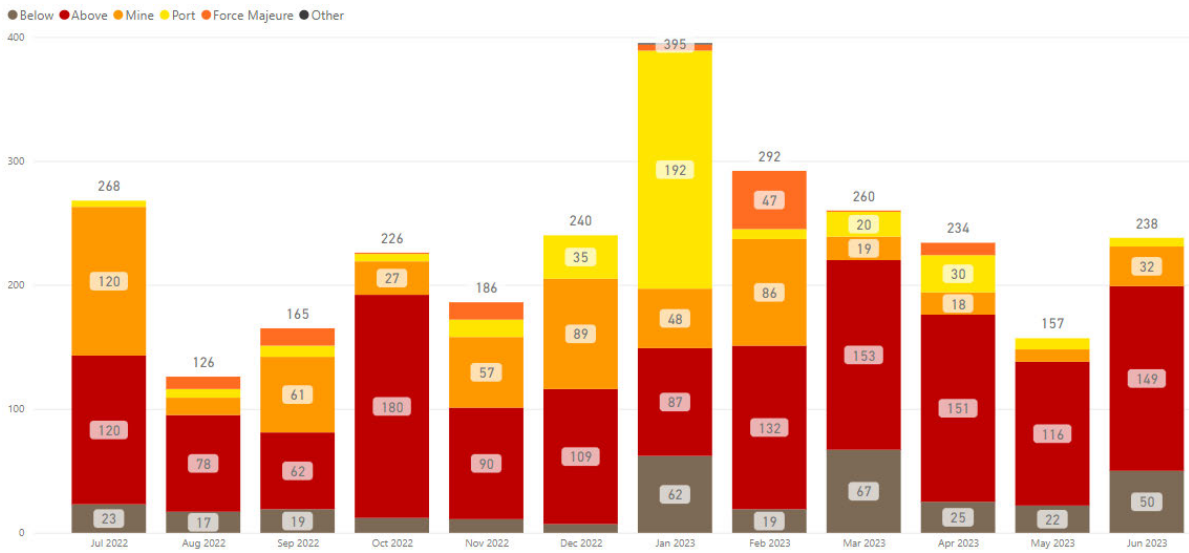


Figure 11 - Moura System – Cancellations

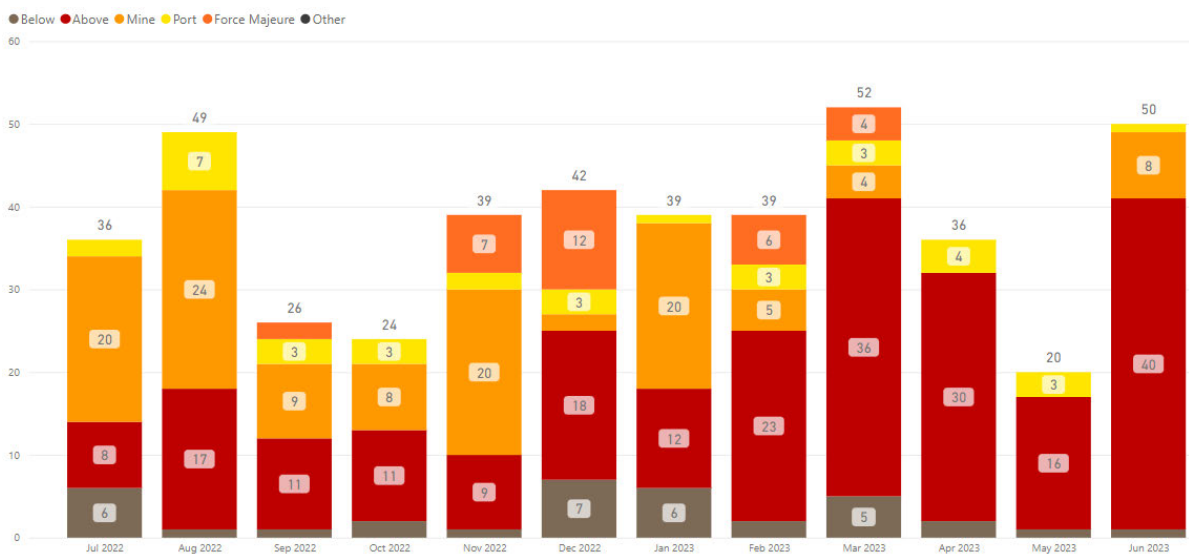
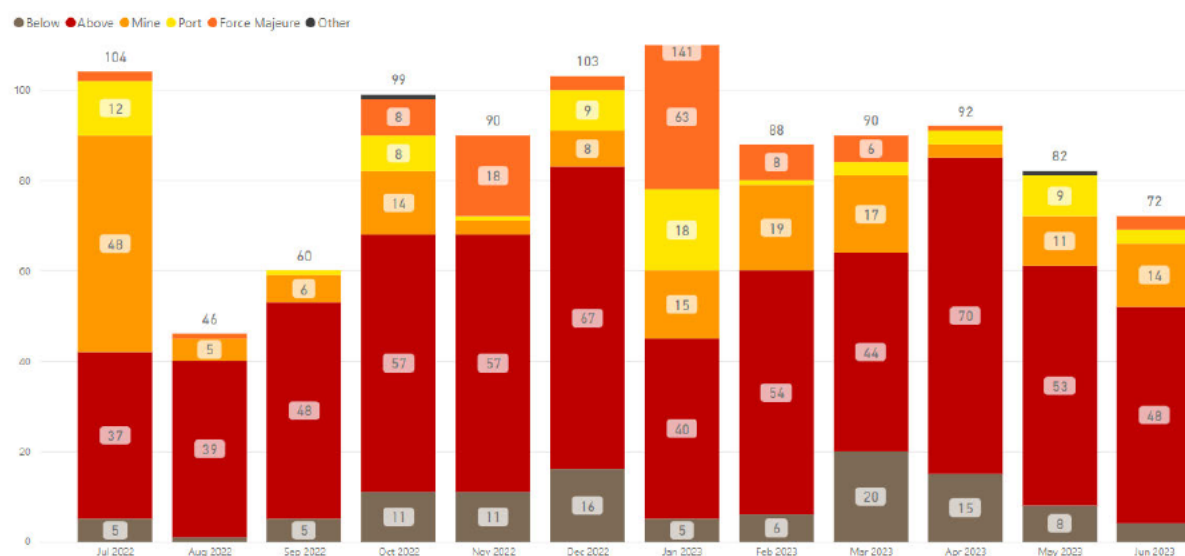


Figure 12 – Newlands System and GAPE – Cancellations



7.2 Temporary Speed Restrictions

A Temporary Speed Restriction (TSR) is an operational control used to ensure continuity of safe operations where the rail infrastructure is impacted by a fault, defect, incident or where the risk of a defect / fault is exacerbated due to environmental factors (for example, temperature related rail stress). A TSR allows train services to keep running, albeit at a reduced speed, until such time as the fault or defect can be rectified in a planned manner, or where the risk reduces.

Given the impact that speed restrictions have on train cycle times, network congestion and useable capacity in a Coal System, one of Aurizon Network's asset management strategies is to focus on the removal of speed restrictions applied in critical locations and/or those which have a high impact. In practice, this means that Aurizon Network would prioritise the rectification of the underlying fault, defect or incident which in turn, allows the TSR to be lifted. This maintenance practice should see a reduction in delays due to reliability and track defects and provide increased operational recovery options through improvements in train cycle times.

Aurizon Network's performance is illustrated below through a comparison of TSR delay minutes year on year. To normalise the results across individual Coal Systems, TSR Delay Minutes are expressed in "minutes per 100 train kilometres" within Table 17.

Table 17 TSR Delay Minutes per 100 Train Km - FY23 vs FY22

System	FY23	FY22	Variance
Blackwater	9.01	5.46	▲
Goonyella	5.12	4.59	▲
Moura	13.56	10.19	▲
Newlands / GAPE	2.93	3.78	▼

Aurizon Network saw a deterioration (increase) in TSR delay minutes in the Blackwater, Goonyella and Moura Coal Systems. TSR delay minute performance in Newlands / GAPE improved. Adverse weather was a key factor impacting asset condition, delays and cancellation outcomes in FY23. Aurizon Network has seen improvement in these metrics during FY23 Q4 as the weather improved.

7.3 Overall Track Condition Index

The OTCI provides an indicator of overall track quality for each coal system by measuring track geometry variation over time. The index is calculated from data captured by track recording vehicles and is used to monitor trends in track condition. An OTCI that is trending downwards is indicative of improving track quality. Conversely, an OTCI that is trending upwards may indicate that the track condition is either deteriorating or is being managed in a way that is 'fit for purpose' as determined by the Rail Infrastructure Manager.

Table 18 Average OTCI - FY23 vs FY22

System	FY23	FY22	Variance
Blackwater	21.0	21.5	▼
Goonyella	21.0	21.0	--
Moura	24.4	25.0	▼
Newlands / GAPE	18.5	18.3	▲

Track Recording Runs typically occur every 6 months. The average OTCI for the Newlands system for FY23 was impacted by a modest increase measured in the November 2022 run. The May 2023 run indicates OTCI has since returned to the pre-November 2022 level.