

Quarterly Maintenance Cost Report

April – June 2019

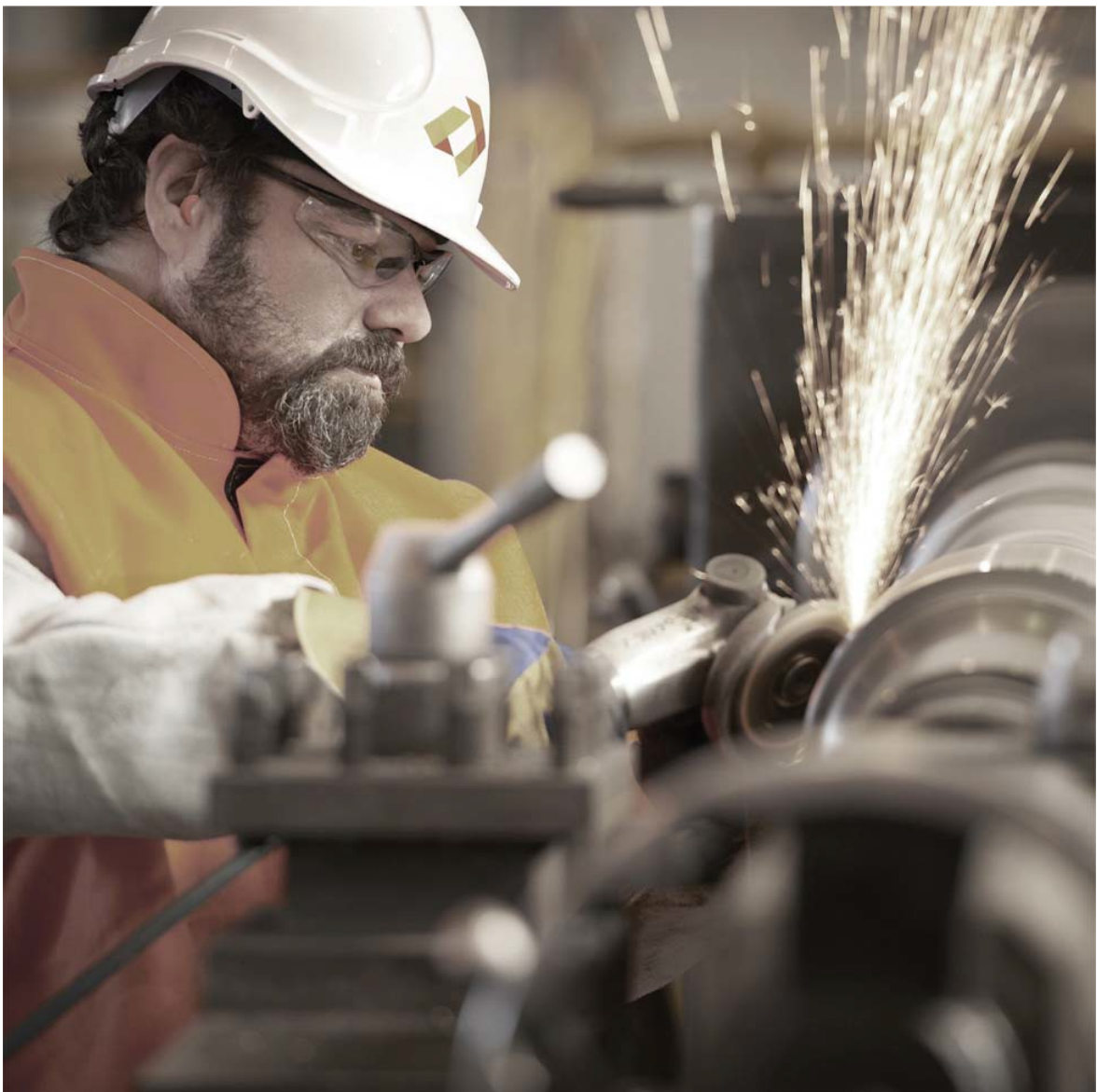


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Quarterly Maintenance Cost Report

1.0 Report Contents

This report is provided to the QCA in accordance with Aurizon Network's 2017 Access Undertaking (**UT5**); clause 10.3.2 (c).

It provides transparency around Aurizon Network's maintenance performance by comparing scope delivered and costs incurred for the quarter, April to June 2019 (**Reporting Period**), to the QCA's final approval of UT5 issued in February 2019 (**UT5 Final Decision**). The forecast scope and costs within the UT5 Final Decision were published as annual totals. To provide a meaningful comparison for the Reporting Period, the FY2019 totals provided in the UT5 Final Decision have been apportioned to the Reporting Period based on Aurizon Network's annual budget, which is phased quarterly.

This information is provided for the four coal systems in the Central Queensland Coal Network (**CQCN**); Blackwater, Goonyella, Moura, and Newlands.

It should be noted that while the UT5 Final Decision contains individual Reference Tariffs and Allowable Revenues for the Goonyella to Abbot Point Expansion (**GAPE System**), the GAPE System is not a geographically distinct coal system. Rather, it is akin to an expansion tariff required to facilitate the pricing arrangements attributable to GAPE Train Services. The scope of the GAPE project included significant infrastructure upgrades in the Newlands system, which are utilised by all GAPE and Newlands Train Services. Similarly, all GAPE Train Services utilise existing Newlands system infrastructure. As a result, Newlands and GAPE are treated as a single system for this report.

Some of the data in this report will also be included in Aurizon Network's Quarterly Performance Report, which will be published at the following link:

<http://www.aurizon.com.au/what-we-deliver/network/network-downloads>.

2.0 Network Performance Metrics

2.1 Safety

Safety is Aurizon Network's core value. Aurizon Network aspires to be world class in safety through its journey to ZEROHARM, which has delivered tangible benefits in terms of safety performance and safety culture. ZEROHARM comprises:

The logo for ZEROHARM, with 'ZERO' in a larger, bold, orange font and 'HARM' in a smaller, regular, orange font.

- ZERO incidents;
- ZERO injuries;
- ZERO work-related illnesses; and
- ZERO environmental incidents.

Injury Reporting Metrics

Aurizon Network's strong safety performance directly benefits the coal supply chain by:

- > reducing the number of unplanned system interruptions; and
- > allowing Aurizon Network to maximise productive time within maintenance track possessions.

This ultimately promotes greater network reliability through a more effective and productive asset maintenance regime.

Aurizon's primary injury reporting metrics include the:

- > Total Recordable Injury Frequency Rate (**TRIFR**), which measures the number of incidents per million person-hours worked; and
- > Lost Time Injury Frequency Rate (**LTIFR**), which measures the number of lost time injuries occurring in a workplace per million hours worked.

To continue the journey to becoming world leading in safety, Aurizon Network revised its injury definitions from 1 July 2017. The key changes include:

- > the inclusion of contractors in all injury metrics;
- > widening the scope of total recordable injuries to include all restricted work injuries; and
- > expanding the definition of 'Lost Time Injuries' such that it captures any lost day of work following the injury¹.

Figure 1 illustrates the TRIFR for Aurizon staff since June 2011, as compared with the LTIFR. Since that time, there has been a noticeable improvement in safety performance in terms of TRIFR.

¹ The previous definition of 'Lost Time Injuries' only captured instances where the injury impacted the next rostered shift.

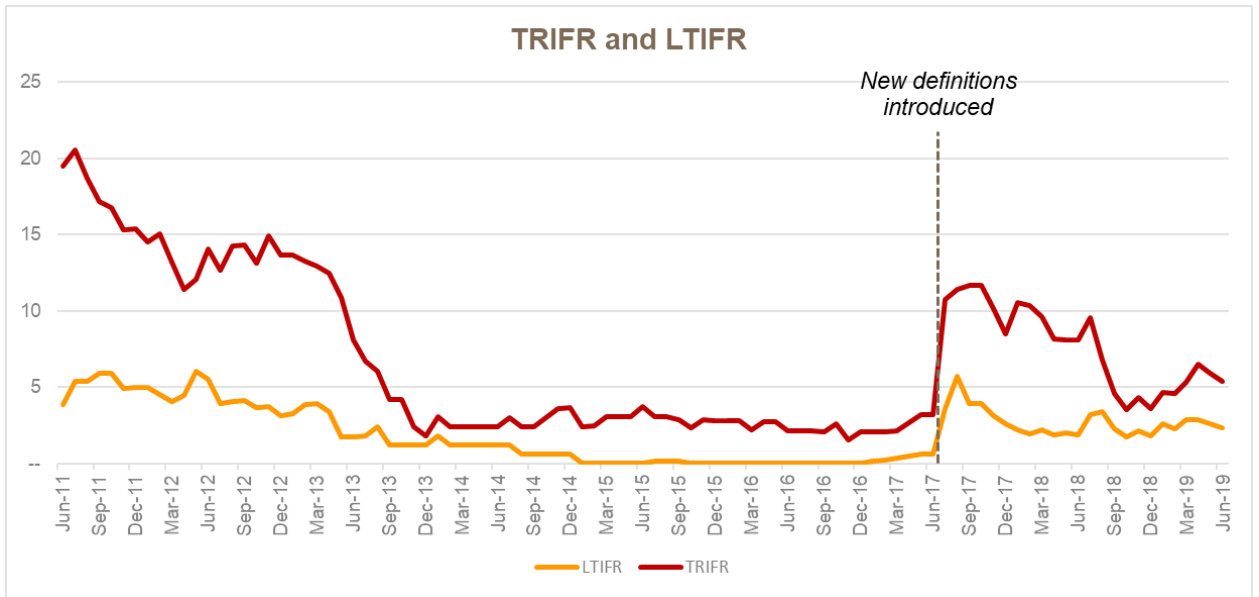


Figure 1 – TRIFR and LTIFR

Major Reportable Safety Incidents

Aurizon Network confirms that there were no major reportable safety incidents reported to the Safety Regulator during the Reporting Period.

Safety incidents reported to the Safety Regulator	Blackwater	Goonyella	Moura	Newlands	GAPE
April – June 2019	--	--	--	--	--

Table 1 - Number of major reportable safety incidents reported to the Safety Regulator in the quarter

2.2 Network Reliability

Coal Carrying Train Services

Table 2 provides a measure of the throughput achieved by each coal system, for each month within the Reporting Period. It presents the aggregate Gross Tonne Kilometres (GTK), Net Tonnes, Net Tonne Kilometres (NTK) and Electric Gross Tonne Kilometres (eGTK) for Coal Carrying Train Services.

Coal Carrying Train Services	Blackwater	GAPE	Goonyella	Moura	Newlands
April 2019					
GTK'000	3,096,128	716,353	3,249,923	227,021	234,686
Net Tonnes	5,329,011	1,394,521	10,035,489	930,055	1,161,848
NTK'000	1,931,209	444,089	2,037,840	142,008	144,870
eGTK'000	2,415,916	--	3,048,491	--	--
May 2019					
GTK'000	3,465,487	895,013	3,376,499	275,811	222,797
Net Tonnes	6,130,925	1,743,157	10,408,084	1,062,880	1,124,962
NTK'000	2,174,920	555,335	2,126,656	168,935	138,332
eGTK'000	2,739,893	--	3,157,897	--	--
June 2019					
GTK'000	3,337,462	871,229	3,863,028	274,104	220,118
Net Tonnes	5,756,799	1,708,996	11,939,131	1,039,527	1,069,065
NTK'000	2,078,745	540,715	2,437,267	165,257	136,514
eGTK'000	2,600,305	--	3,627,973	--	--

Table 2 - Coal Carrying Train Service Performance

Dewirements

The number of dewirements recorded for each quarter since Q1 FY2010, are shown in **Table 3** below.

There were no dewirements during the Reporting Period.

Number of Dewirements	Blackwater	Goonyella
Jul-Sept 2010	--	2
Oct-Dec 2010	--	--
Jan-Mar 2011	--	2
Apr-Jun 2011	--	--
Jul-Sept 2011	--	1
Oct-Dec 2011	1	--
Jan-Mar 2012	1	1
Apr-Jun 2012	1	1
Jul-Sept 2012	1	--
Oct-Dec 2012	--	--
Jan-Mar 2013	--	--
Apr-Jun 2013	--	1
Jul-Sept 2013	1	--
Oct-Dec 2013	1	--
Jan-Mar 2014	--	--
Apr-Jun 2014	--	1
Jul-Sept 2014	--	2
Oct-Dec 2014	--	--
Jan-Mar 2015	--	--
Apr-Jun 2015	--	--
Jul-Sept 2015	--	--
Oct-Dec 2015	--	--
Jan-Mar 2016	--	--
Apr-Jun 2016	1	--
Jul-Sept 2016	--	--
Oct-Dec 2016	--	1
Jan-Mar 2017	--	1
Apr-Jun 2017	--	--
Jul-Sept 2017	--	--
Oct-Dec 2017	1	1
Jan-Mar 2018	2	1
Apr-Jun 2018	--	--
Jul-Sep 2018	1	--
Oct-Dec 2018	--	--
Jan-Mar 2019	--	--
Apr-Jun 2019	--	--

Table 3 - Number of Dewirements

Derailments

A Derailment occurs where one (or more) rolling stock wheel(s) leave the rail or track during railway operations. The number of derailments recorded for each quarter since Q1 FY2010 is outlined in **Table 4** below. There were two (2) derailments during the Reporting Period; both in the Blackwater system

Number of Derailments	Blackwater	Goonyella	Moura	Newlands
Jul-Sept 2010	8	11	1	2
Oct-Dec 2010	1	5	3	1
Jan-Mar 2011	7	7	6	1
Apr-Jun 2011	3	8	1	2
Jul-Sept 2011	3	7	3	3
Oct-Dec 2011	5	2	1	--
Jan-Mar 2012	9	5	4	1
Apr-Jun 2012	5	7	3	4
Jul-Sept 2012	6	6	3	--
Oct-Dec 2012	4	6	3	1
Jan-Mar 2013	3	6	2	--
Apr-Jun 2013	3	1	1	--
Jul-Sept 2013	5	4	3	--
Oct-Dec 2013	4	2	--	--
Jan-Mar 2014	6	3	4	1
Apr-Jun 2014	2	3	--	1
Jul-Sept 2014	2	8	2	--
Oct-Dec 2014	5	3	--	1
Jan-Mar 2015	2	4	--	--
Apr-Jun 2015	2	--	--	--
Jul-Sept 2015	--	1	--	--
Oct-Dec 2015	2	3	--	--
Jan-Mar 2016	8	2	--	--
Apr-Jun 2016	1	3	1	--
Jul-Sept 2016	--	1	--	2
Oct-Dec 2016	--	2	1	--
Jan-Mar 2017	2	1	1	--
Apr-Jun 2017	--	--	--	--
Jul-Sept 2017	3	1	1	1
Oct-Dec 2017	2	2	1	--
Jan-Mar 2018	3	--	--	1
Apr-Jun 2018	1	6	--	--
Jul-Sep 2018	1	--	--	--
Oct-Dec 2018	2	1	1	--
Jan-Mar 2019	--	2	--	--
Apr-Jun 2019	2	--	--	--

Table 4 - Number of Derailments

Derailments with a cost of recovery exceeding \$100,000

During the Reporting Period, there were no derailments in which the cost to Aurizon Network of recovery exceeded \$100,000.

Nevertheless, during the Reporting Period, Aurizon Network incurred financial 'settlement' costs in relation to derailments that occurred in prior reporting periods. For transparency, these are also outlined in the table below.

Derailment Incident	Date	Location	Cost (\$)
D1019244	24/01/2018	Duaringa	2,073,272
D1109439	9/06/2018	Waitara	146,527
D1200068	24/11/2018	Marmor	327,818
	10/03/2019	Dalrymple Bay	1,405,296

Table 5 - Derailments with a cost of recovery exceeding \$100,000

Temporary Speed Restrictions

Imposed Temporary Speed Restrictions (TSR) indicate the level of controlled defects on the Network and Removed TSR indicate maintenance undertaken by Aurizon Network to remove operational constraints. TSR are put in place to ensure levels of operational safety are maintained during, for example, track maintenance work.

Figure 2 below shows the number of TSR imposed on and removed from the network within each quarterly reporting period since FY2010.

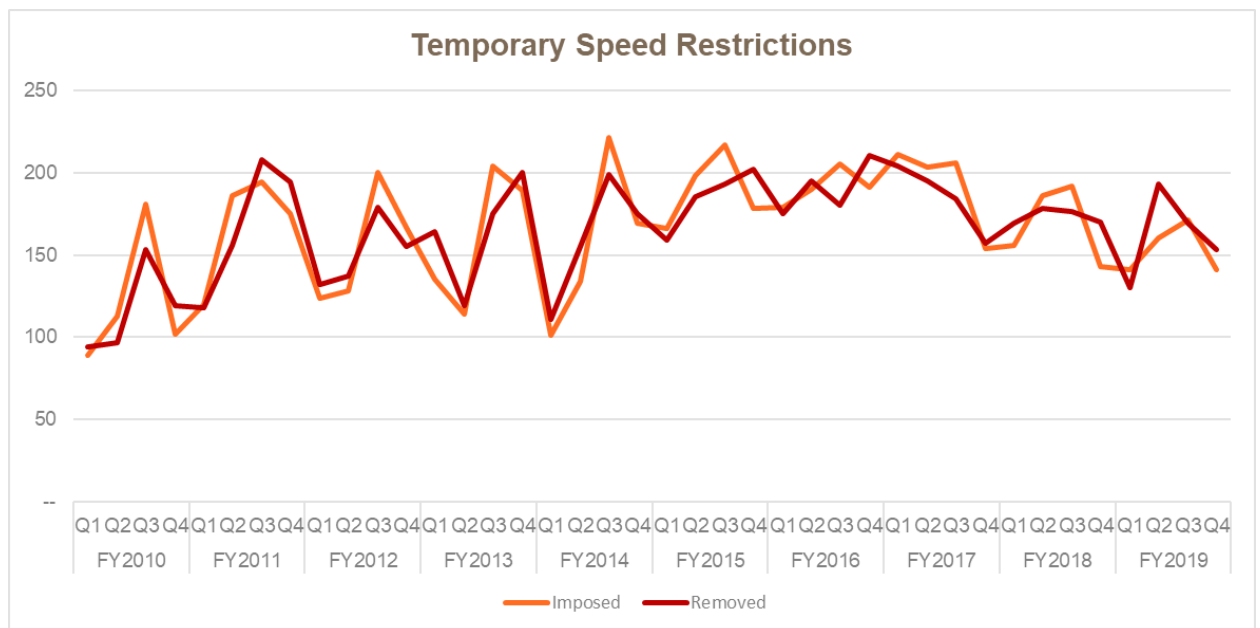


Figure 2 - Temporary Speed Restrictions Imposed and Removed

Below Rail Cancellations

Figure 3 below illustrates the percentage of train services cancelled due to a Below Rail cause.

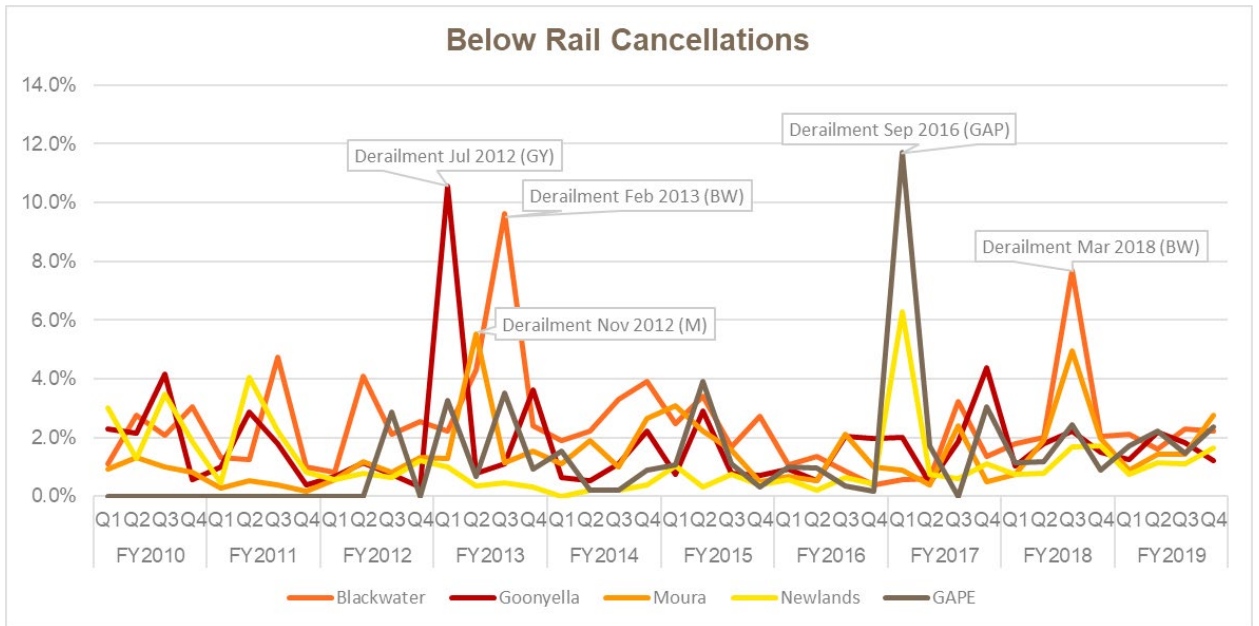


Figure 3 - Percentage of Cancellations due to a Below Rail Cause

Overall Track Condition Index

The Overall Track Condition Index (OTCI) is a measure of quality of the network for each Coal System. It provides a general indicator of track geometry variation over time. The index is calculated from data captured by track recording vehicles and is used by Aurizon Network 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.

Please note that the OTCI values presented below reflect an average over a defined length. It cannot reflect all the variations in track quality which may exist within a coal system. Consequently, it should be interpreted as an indicator of abnormality.

Table 6 provides the OTCI for the Reporting Period.

Overall Track Condition Index	Blackwater	Goonyella	Moura	Newlands
Apr-Jun 2019	29.96	28.07	32.54	25.61

Table 6 - Overall Track Condition Index

Below Rail Transit Time

Below Rail Transit Time (**BRTT**) is an indicator of operational performance of each Coal System. The BRTT includes the following:

- > Section Running Times;
- > Delays from scheduled train path in the daily train plan that can be directly attributed to Aurizon Network but excludes cancellations, delays resulting from compliance with a passenger priority obligation and delays resulting from a force majeure event;
- > Time taken in crossing other trains; and
- > Delays due to operational constraints:
 - directly caused by the activities of Aurizon Network in maintaining the CQCN; or
 - due to a fault or deficiency in the CQCN provided such delays are not contributed to by a railway operator or force majeure events.

Table 7 below outlines this performance measure for each individual coal system during the Reporting Period.

Below Rail Transit Time %	Blackwater	Goonyella	Moura	Newlands	GAPE
Apr-Jun 2019	105%	110%	125%	123%	127%

Table 7 - Below Rail Transit Time Percentage

During the Reporting Period, the BRTT for all coal systems was below their respective Threshold (as per the Access Undertaking). This outcome is indicative of a well performing, fit for purpose network.

3.0 Maintenance Performance

3.1 General Maintenance

Track Defects

Aurizon Network's Network Asset Management System (**NAMS**) uses notifications to request works where a track defect has been identified. The following data in **Table 8** represents the number of Notifications which have been raised for rectification during the Reporting Period.

Rectification Period	Number of Notifications
Under 30 days	1,951
30-90 days	1,485
90 days and over	706
Total	4,142

Table 8 – Number of Notifications

Work Orders vs Maintenance Completed

The number of Work Orders Created is compared with the number of Maintenance Tasks Completed, for the Reporting Period, in **Table 9** below.

Work Order type	Number of Work Orders Created	Number of Maintenance Tasks Completed
Immediate	1,646	1,630
Corrective	2,521	2,595
Preventive	8,015	8,460
Total	12,182	12,685

Table 9 - Work Orders vs Maintenance Completed

Depending on the severity of the defect, work orders created during the Reporting Period may be scheduled for execution over varying time horizons, for example, immediate, 1 week, 3 months or 12 months etc. Consequently, the number of maintenance tasks completed for the quarter will not necessarily match the number of work orders created.

Similarly, please note that the data relating to the:

- > number of work orders created; and
- > maintenance tasks completed,

includes planned maintenance tasks (e.g. inspections). These tasks are periodic in nature, and do not have a corresponding Notification; hence there were more Work Orders created than Notifications raised.

4.0 Network Maintenance Costs

This section outlines Aurizon Network's actual maintenance performance for the Reporting Period in terms of costs incurred for CQCN maintenance activities and scope delivered for mechanised maintenance activities.

The QCA's Final Decision on UT5 was published on 6 December 2018 and consequently, this report compares Aurizon Network's actual maintenance cost and scope to the forecasts outlined in the UT5 Final Decision. It should also be noted that the UT5 Final Decision does not present costs on a quarterly basis. To facilitate a comparison for the Reporting Period, the annual costs outlined in the UT5 Final Decision have been apportioned in line with Aurizon Network's maintenance budget phasing for FY2019.

4.1 Overall Maintenance Costs

Total Direct Maintenance Cost - CQCN

The total direct maintenance costs incurred during the Reporting Period is shown in **Figure 4** below. For comparative purposes, actual costs for the Reporting Period are compared to both the QCA's UT5 Final Decision and the costs incurred during the same quarter in the previous financial year.

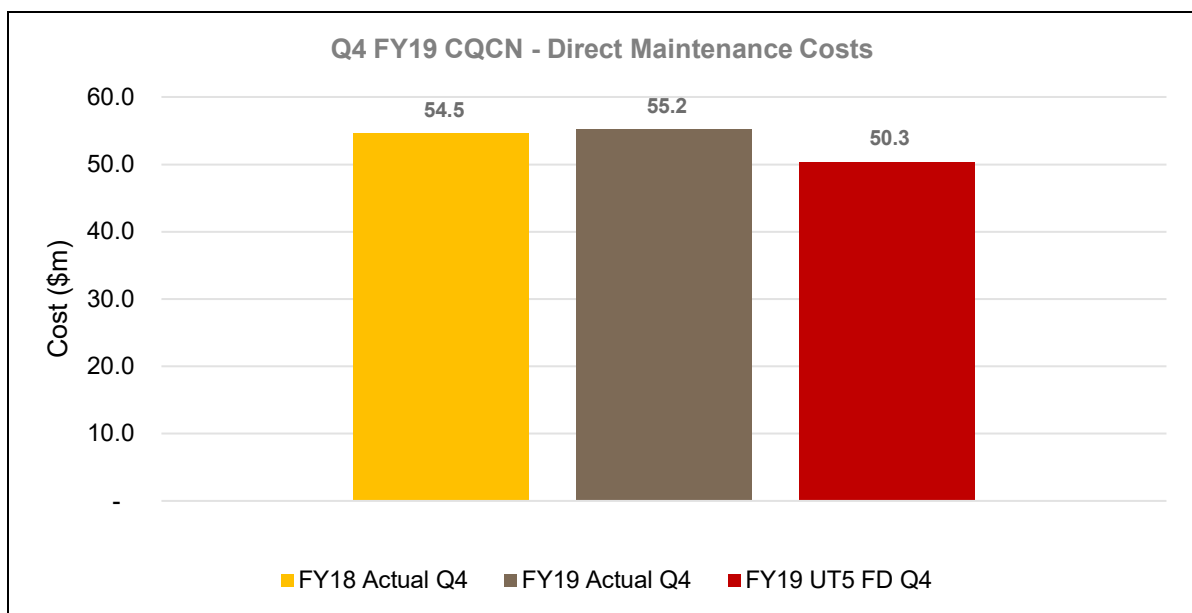


Figure 4 - Total Network Direct Maintenance Cost

Aurizon Network's direct maintenance expenditure for the Reporting Period was \$55.2m; an amount of \$4.9m or 9.7% higher than the apportioned UT5 Final Decision and 1.3% higher than Q4 FY2018.

In comparison to the apportioned UT5 Final Decision, Aurizon Network's spend during the Reporting Period was primarily attributable to higher Mechanised Ballast Undercutting scope completion. Underspends occurred in the Track, Structures and Traction maintenance products.

Mechanised Ballast Undercutting costs exceeded the UT5 Final Decision allowance by \$1.7m largely due to higher scope completion during the quarter. Scope was higher during the quarter due to access changes and catch up of scope not completed in prior months.

Direct Maintenance Cost by Activity

Figure 5 below identifies the total direct maintenance costs incurred during the Reporting Period by activity, in comparison to the apportioned UT5 Final Decision and the same quarter in the previous year.

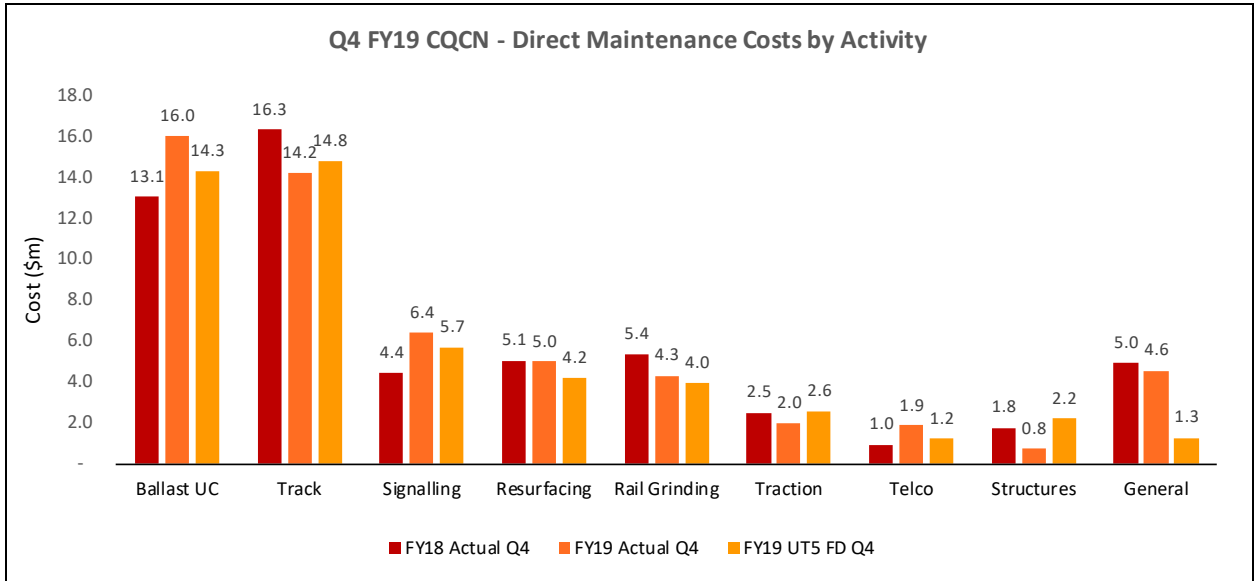


Figure 5 – Direct Maintenance Cost by Activity

A comparison of the actual Gross Tonne Kilometres (GTK) railed during the Reporting Period, relative to the forecast GTK from the UT5 Final Decision is outlined in **Figure 6** below.

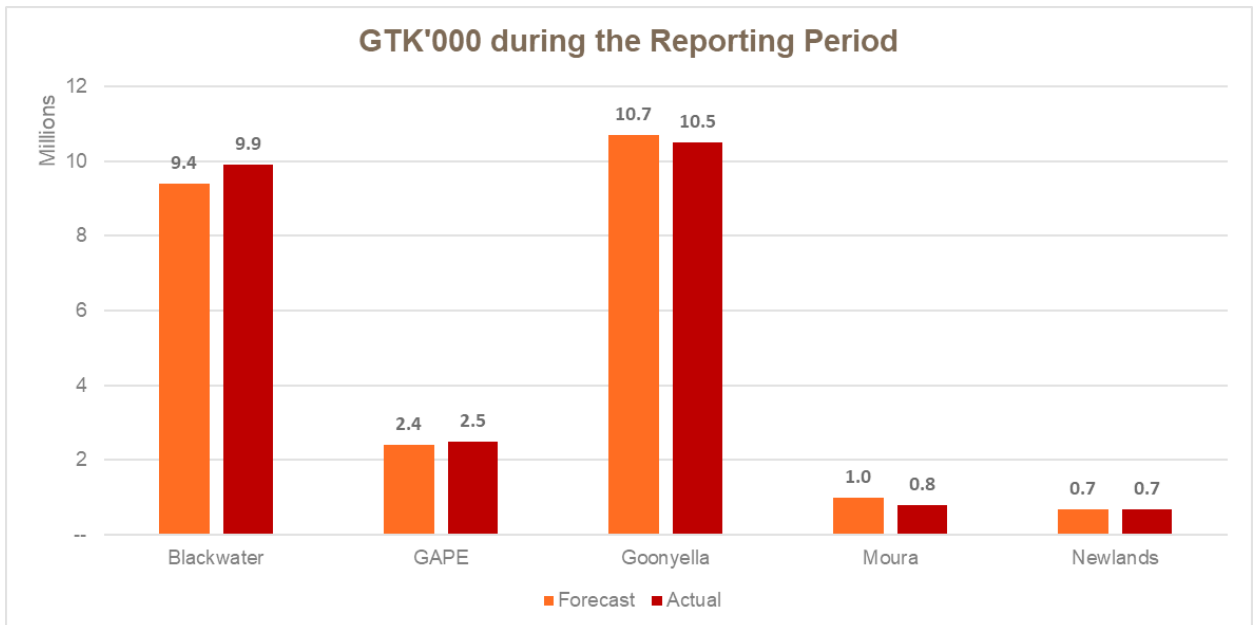


Figure 6 - Forecast GTK vs Actual GTK

Direct Maintenance Cost by System

The direct maintenance cost incurred for the Reporting Period compared against the apportioned UT5 Final Decision and the same quarter in the previous year is shown below for Blackwater (**Figures 7 and 8**), Goonyella (**Figure 9 and 10**), Moura (**Figure 11 and 12**) and Newlands (**Figure 13 and 14**). These costs are broken down per activity for the separate systems.

Blackwater

The direct maintenance costs incurred during the Reporting Period for the Blackwater system was \$19.9m which was 7.4% lower than the apportioned UT5 Final Decision for the same period and 2.5% lower than the fourth quarter in the prior year.

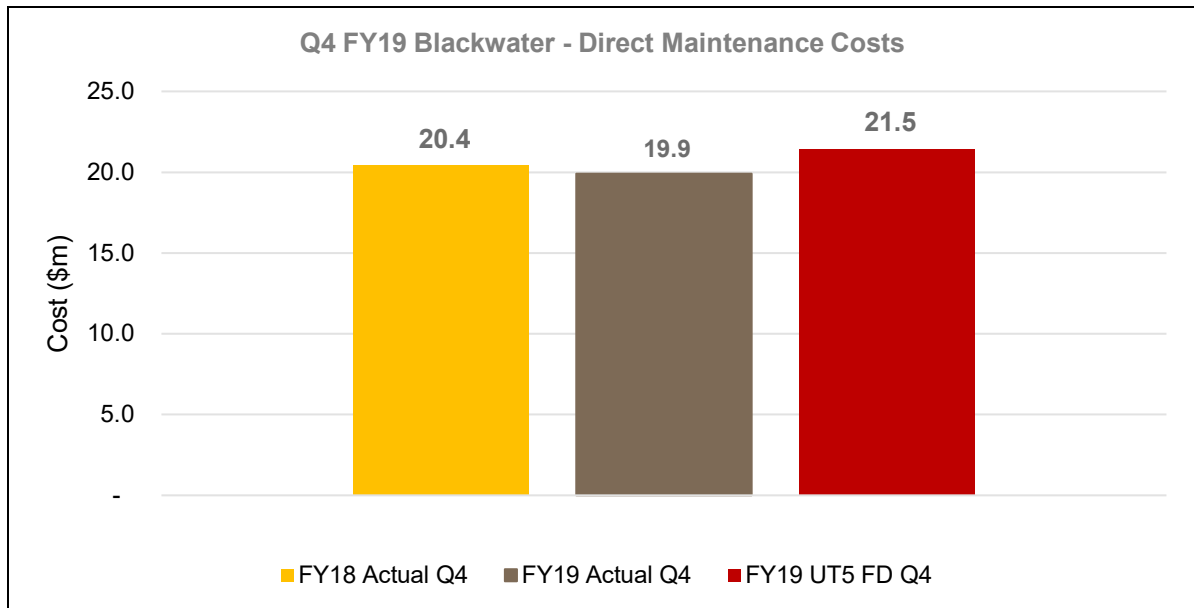


Figure 7 – Blackwater Direct Maintenance Cost

The main underspends during the Reporting Period were in Mechanised Ballast Undercutting, Track, Resurfacing, Rail Grinding, Traction and Structures maintenance activities.

The underspend in Traction can be attributed to a reduction in reactive work due to ongoing renewal of overhead line components resulting in improved system performance.

In relation to Mechanised Ballast Undercutting, the closure regime for the fourth quarter did not support completion of scope in the Blackwater system. Consequently, production was predominantly delivered in the Goonyella system.

Turnout resurfacing was higher than the UT5 Decision apportionment in the quarter given defects found by the track recording vehicle as part of its periodic inspection regime.

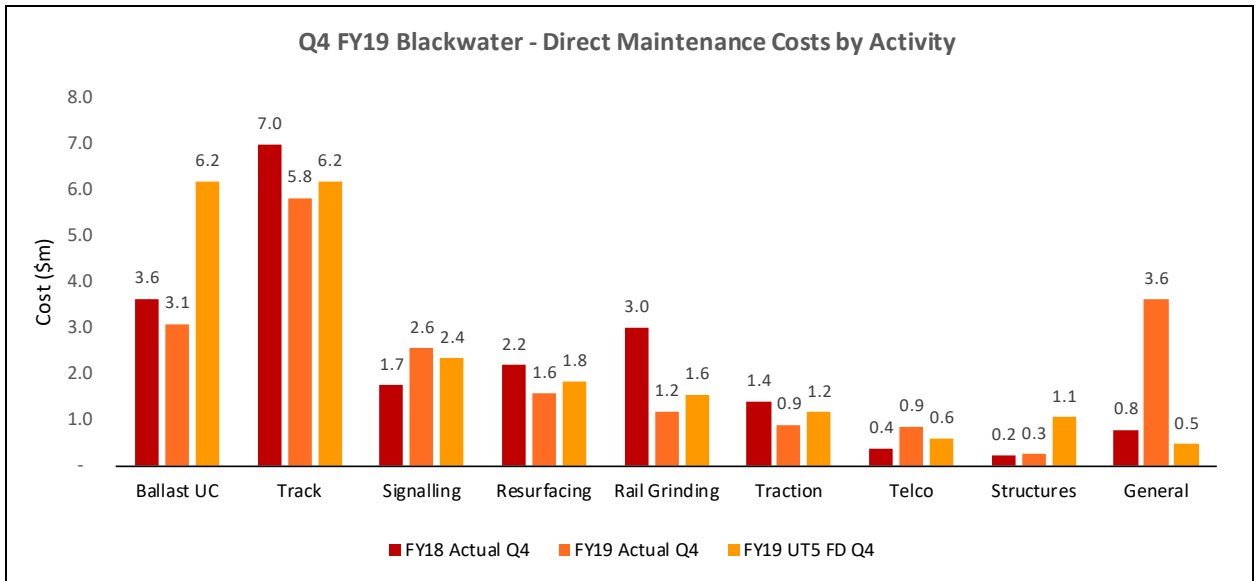


Figure 8 - Blackwater Direct Maintenance Cost by Activity

Goonyella

The direct maintenance cost incurred during the Reporting Period for the Goonyella system was \$26.7m, which was \$5.7m, or 27.1% higher than the UT5 Final Decision apportionment. This represents a \$1m, or 3.9%, increase from the comparative period in FY18.

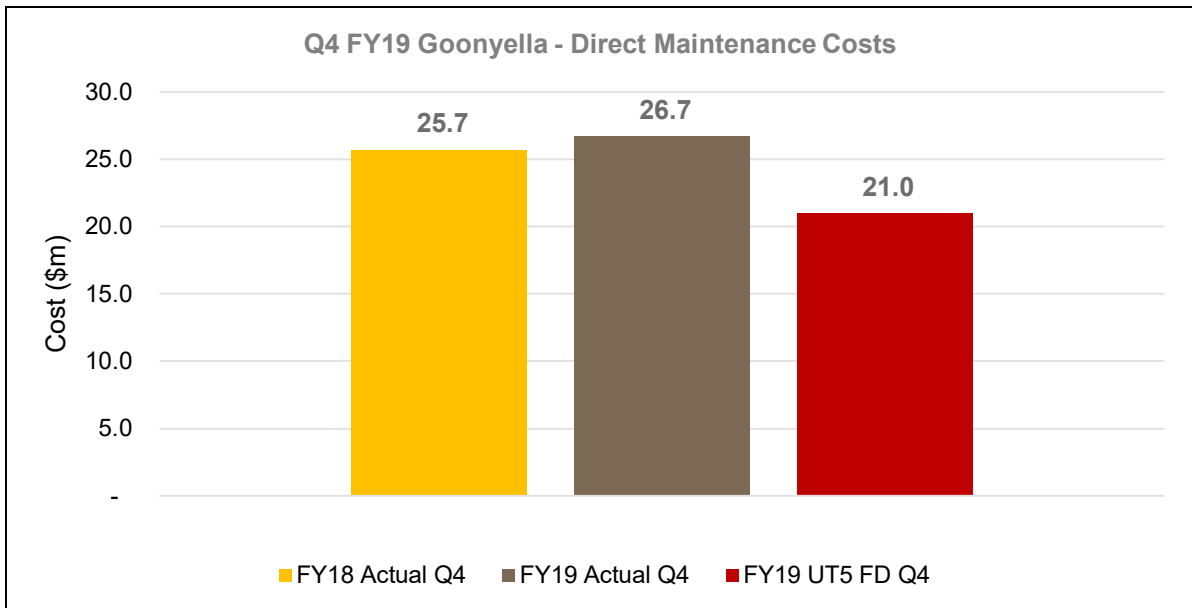


Figure 9 - Goonyella Direct Maintenance Cost

Goonyella's maintenance cost by activity is shown in **Figure 10**. The overspends against the UT5 Final Decision are attributable to Ballast Undercutting, Track, Resurfacing, Rail Grinding and Telecommunications maintenance activities.

The overspend on Ballast Undercutting was attributable to a favourable closure regime during the fourth quarter which saw additional scope completed.

The overspend in Resurfacing was due to additional scope being completed. The Mechanised Production team completed 387km of production during the quarter against planned Mainline Resurfacing scope of 287km. The additional production was in response to defects identified by the track recording vehicle.

The decrease in Q4 turnout resurfacing was primarily due to scope already having been achieved in the first three quarters of year.

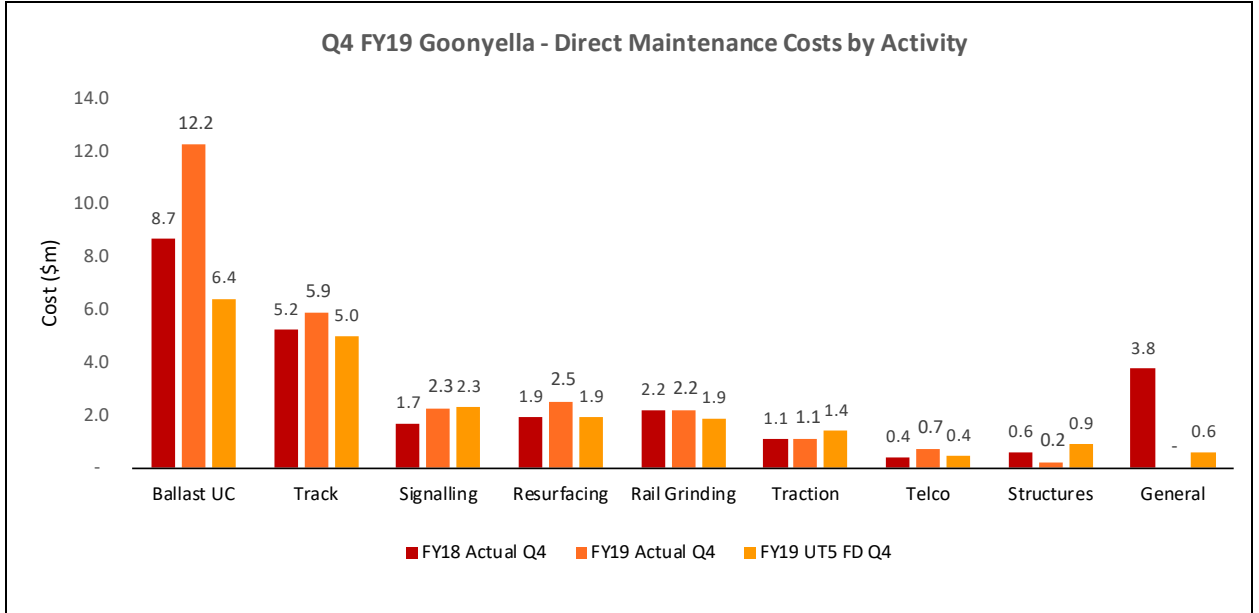


Figure 10 – Goonyella Direct Maintenance Cost by Activity

Moura

The direct maintenance costs incurred during the Reporting Period for the Moura system was \$4.2m, which was \$1.1m higher than the UT5 Final Decision and \$1.7m lower than the comparative period from the previous year.

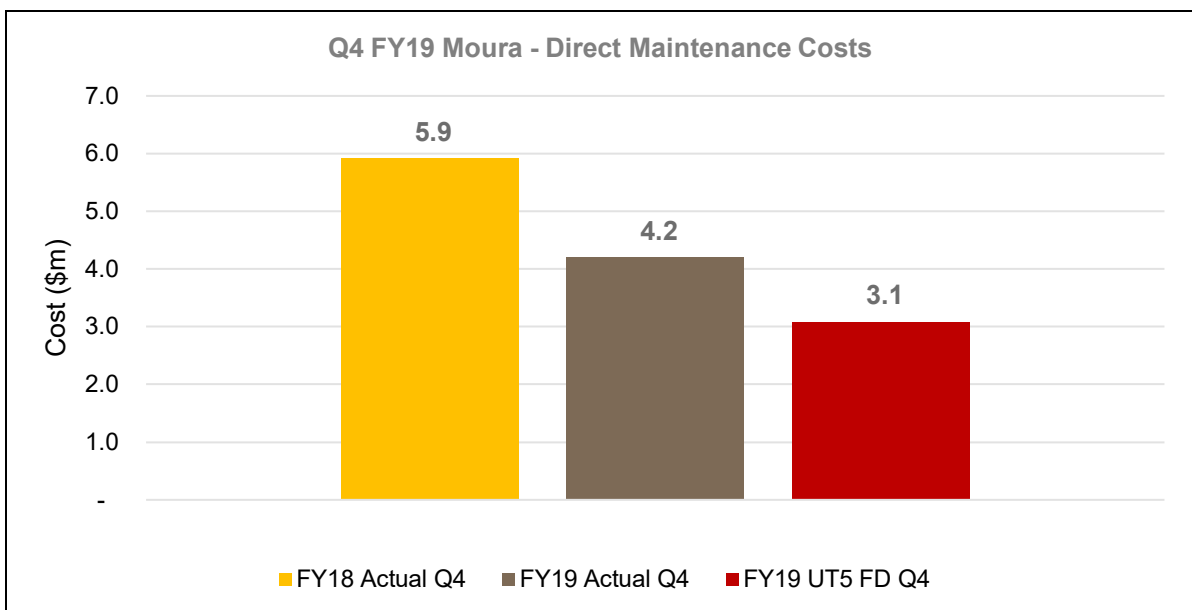


Figure 11 - Moura Direct Maintenance Cost

The primary contributors to the overspend were Ballast Undercutting, Signalling, Resurfacing and General maintenance activities. This was partially offset by an underspend in Track maintenance. These variances were due to the timing of activities compared to the apportionment of the UT5 Final Decision.

In relation to Ballast Undercutting, additional scope was completed in Moura relative to the UT5 Final Decision apportionment given additional tonnages across the system.

The Mechanised Production team completed Resurfacing Mainline scope of 55.3km against planned scope of 11.6km. The increased production was attributable to the rectification of defects found by the track recording vehicle as part of its periodic inspection regime.

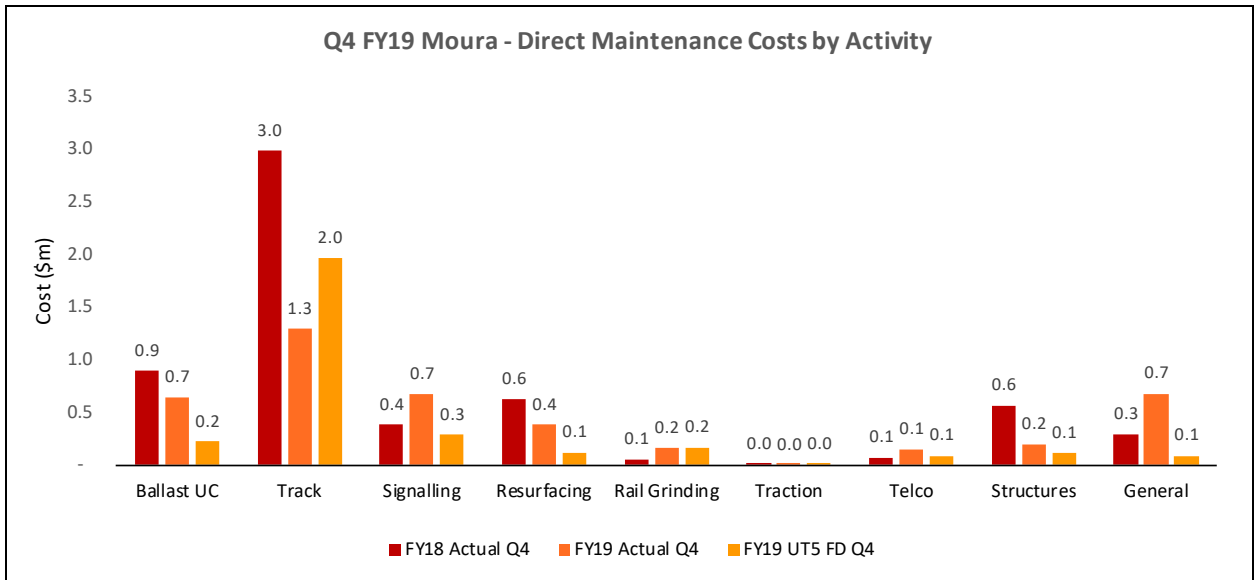


Figure 12 - Moura Direct Maintenance Cost by Activity

Newlands

The direct maintenance costs incurred during the Reporting Period for the Newlands system was \$4.4m, which was \$0.5m lower than the UT5 Final Decision apportionment and \$1.9m higher than the comparative period from the previous year.

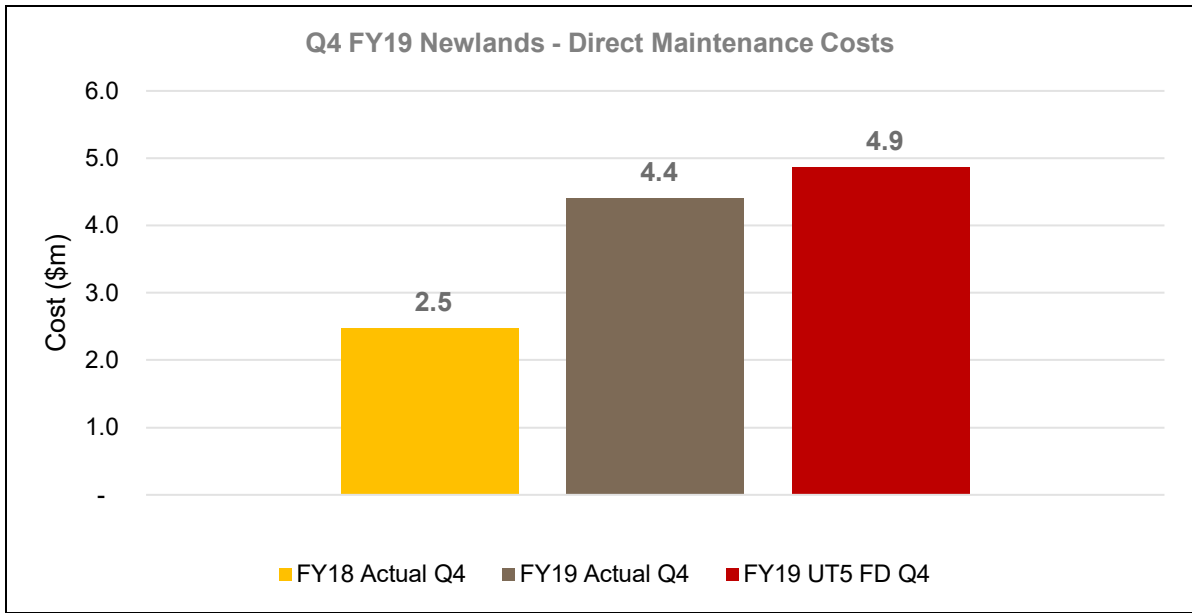


Figure 13 - Newlands Direct Maintenance Cost

Signalling, Resurfacing, Rail Grinding, Telecommunications and General maintenance were overspent during the quarter. However, these were offset by savings against the UT5 Final Decision apportionment in Ballast Undercutting, Track and Structures maintenance activities.

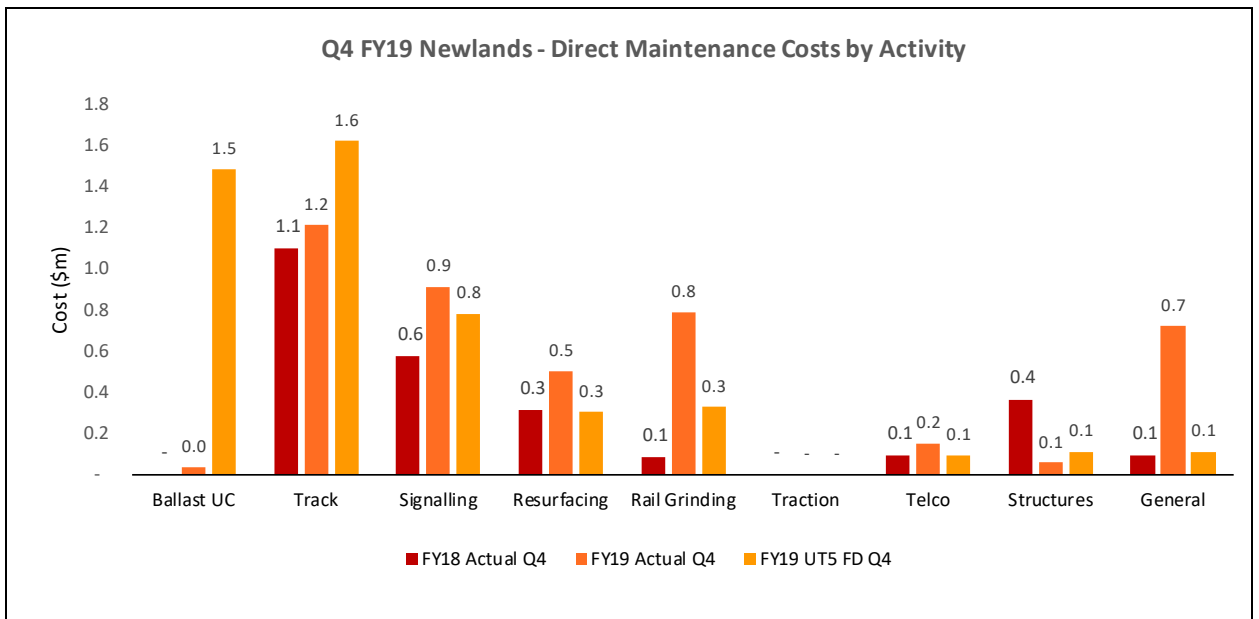


Figure 14 - Newlands Direct Maintenance Cost by Activity

4.2 Mechanised Maintenance

Mechanised maintenance works utilise mechanical machinery and comprise the following categories: Ballast Undercutting, Rail Grinding, and Resurfacing. Mechanised maintenance scope performance for the Reporting Period is outlined in more detail below. Please note that the UT5 Final Decision scope for each coal system is typically set in advance of the regulatory period. The distribution of actual scope between systems is based on a detailed assessment by Aurizon Network’s engineers and planners, who prioritise scope based on asset condition and criticality. As a consequence, variances may exist due to timing differences between when the scope is set for regulatory purposes and when it is planned for execution.

Ballast Undercutting

Ballast Undercutting by system for the Reporting Period is shown below in **Figure 15** and **Figure 16**, in terms of both linear kilometres and number of turnouts, compared with the UT5 Final Decision.

During the Reporting Period, the Mechanised Production team delivered 24% of the FY19 mainline undercutting scope and 95% of scope on a year to date basis. Ballast Undercutting scope was higher in the Goonyella system and lower in the Blackwater system during the quarter to match the closure regime. Scope completed in the Moura system was lower than the UT5 apportioned Final Decision given increased scope was completed in prior quarters.

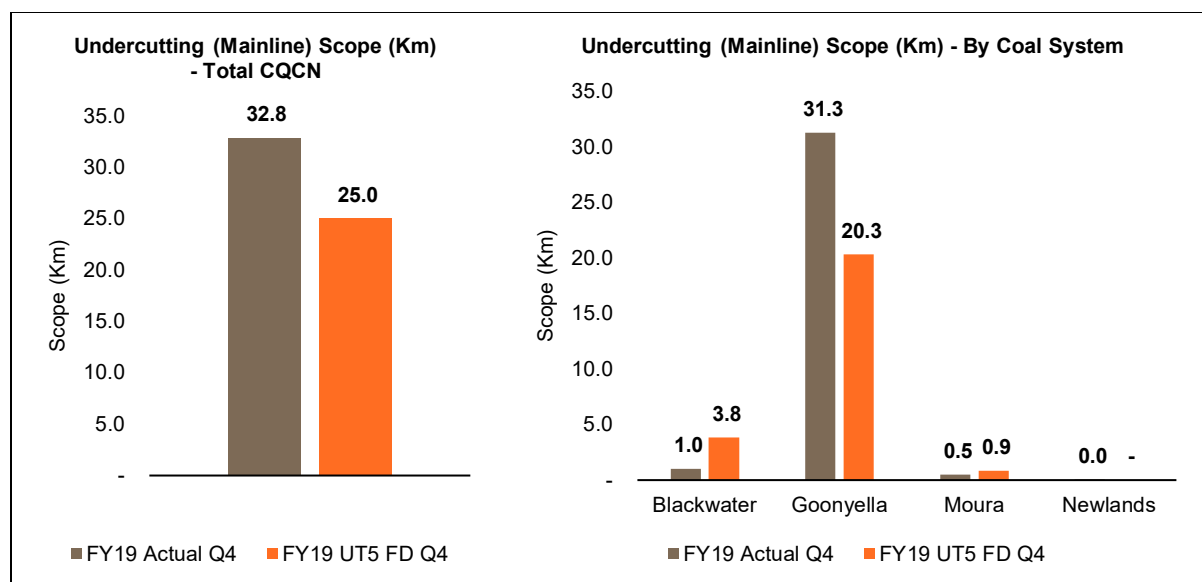


Figure 15 – Mainline Ballast Undercutting scope by System

The Turnout Ballast Undercutting compared with the UT5 Final Decision is shown in **Figure 16**

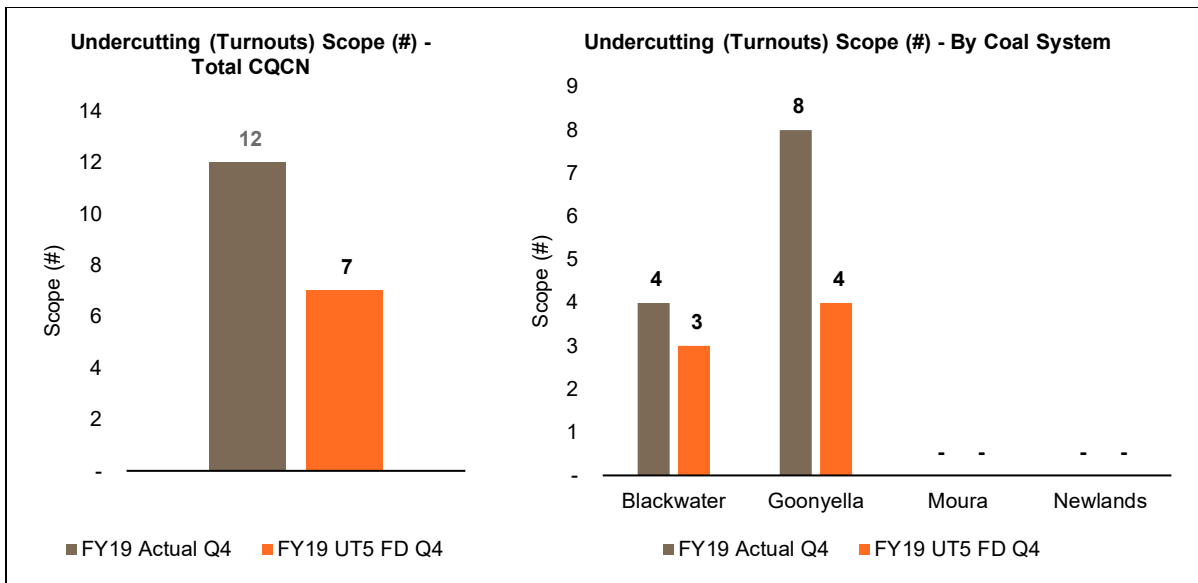


Figure 16 - Ballast Undercutting (Turnouts) by System

Figure 16 above presents Turnout Undercutting scope achieved in comparison to the apportioned UT5 Final Decision for the Reporting Period.

During the Reporting Period, the Mechanised Production team delivered 29% of the FY2019 mainline undercutting scope and 93% of scope on a year to date basis.

The Mechanised Production team undercut a total of 12 turnouts during the Reporting Period, which was 5 higher than the apportioned UT5 Final Decision. Four turnouts were undercut in Blackwater and eight were undercut in Goonyella. Ballast Undercutting scope in the Blackwater and Goonyella systems was higher than the apportioned UT5 Final Decision. Moura and Newlands scope was in line with plan.

Rail Grinding

Mainline Rail Grinding by system for the Reporting Period is shown in **Figure 17** below.

During the Reporting Period, 909km of Mainline Grinding scope was delivered, which was 162km lower than the apportioned UT5 Final Decision.

For the fourth quarter, 22% of the total Mainline Rail Grinding scope for FY2019 was delivered and 94% of scope was delivered on a year to date basis.

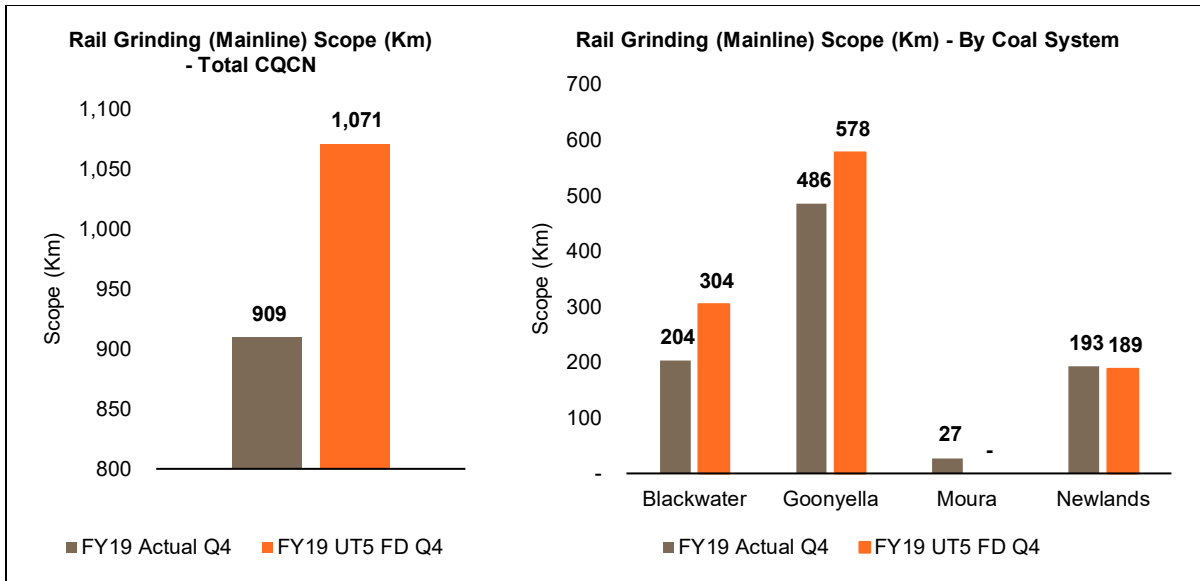


Figure 17 - Rail Grinding (Mainline) by System

Rail Grinding (Turnouts) by system for the Reporting Period is shown in **Figure 18** below.

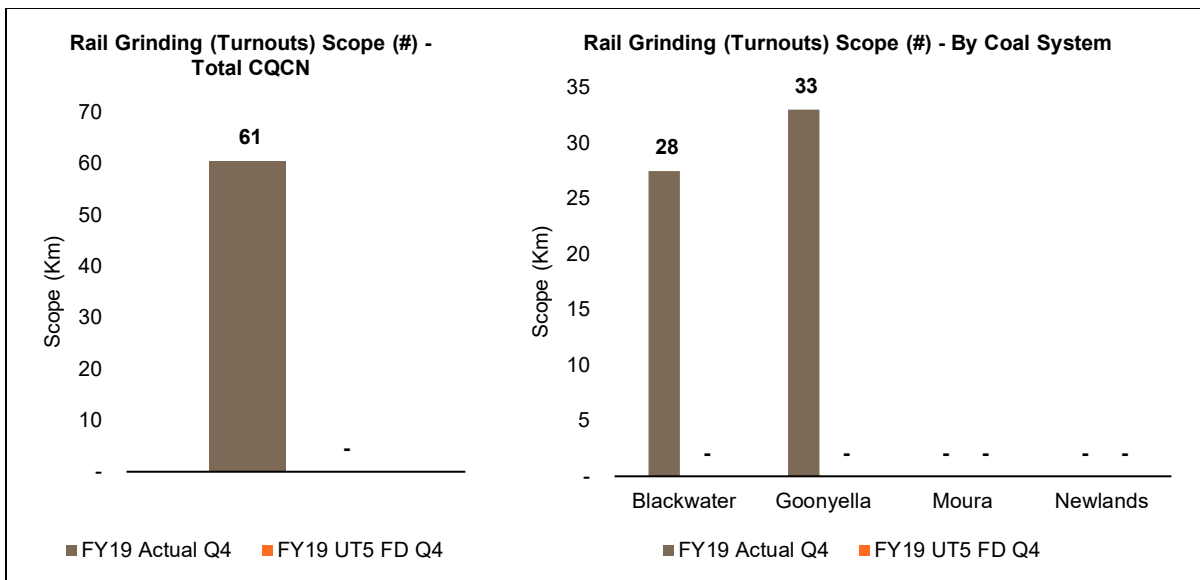


Figure 78 - Rail Grinding (Turnouts) by System

During the Reporting Period, Rail Grinding completed 61 turnouts representing 8% of the total Turnout Grinding scope for FY2019. 97% of total Turnout grinding scope was completed within FY19.

Resurfacing

Resurfacing (Mainline) by system for the Reporting Period is shown below in **Figure 19**.

During the reporting period, Aurizon Network delivered 658 kilometres of Mainline Resurfacing; which was 147km or 29% higher than the apportioned UT5 Final Decision. This result was primarily driven by higher production in the Goonyella and Moura systems.

During the Reporting Period, Mechanised Production team delivered 31% of the total UT5 Final Decision Mainline scope for FY2019 and completed 102% of scope within the year to date.

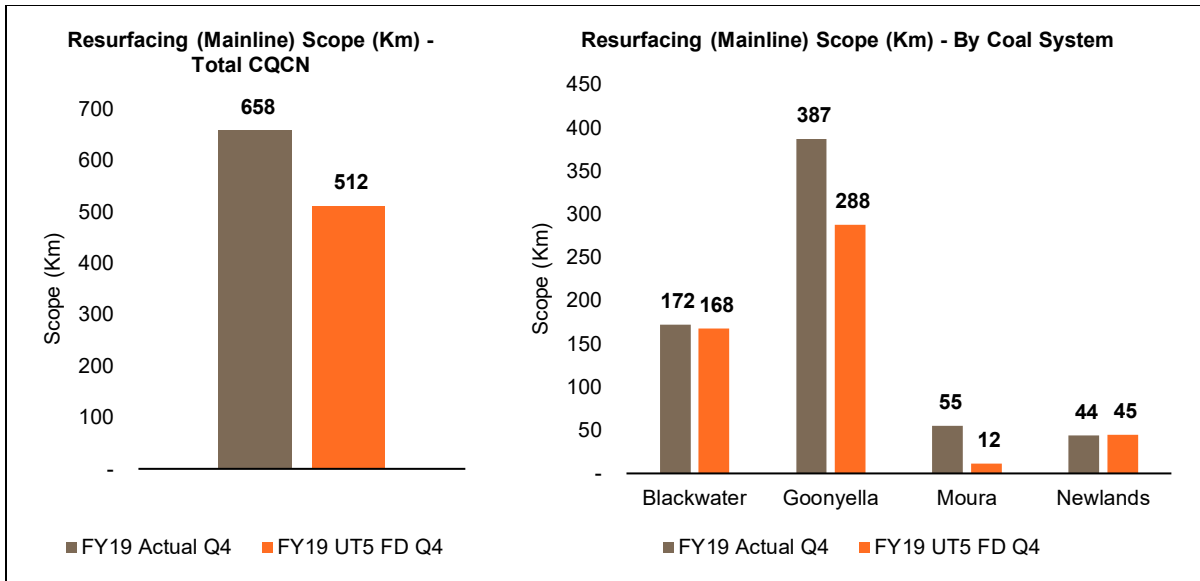


Figure 8 - Resurfacing (Mainline) by System

Additional scope was achieved in the Goonyella and Moura systems to rectify defects identified by the track recording vehicle.

Resurfacing (Turnouts) by system for the Reporting Period is shown below in **Figure 20**.

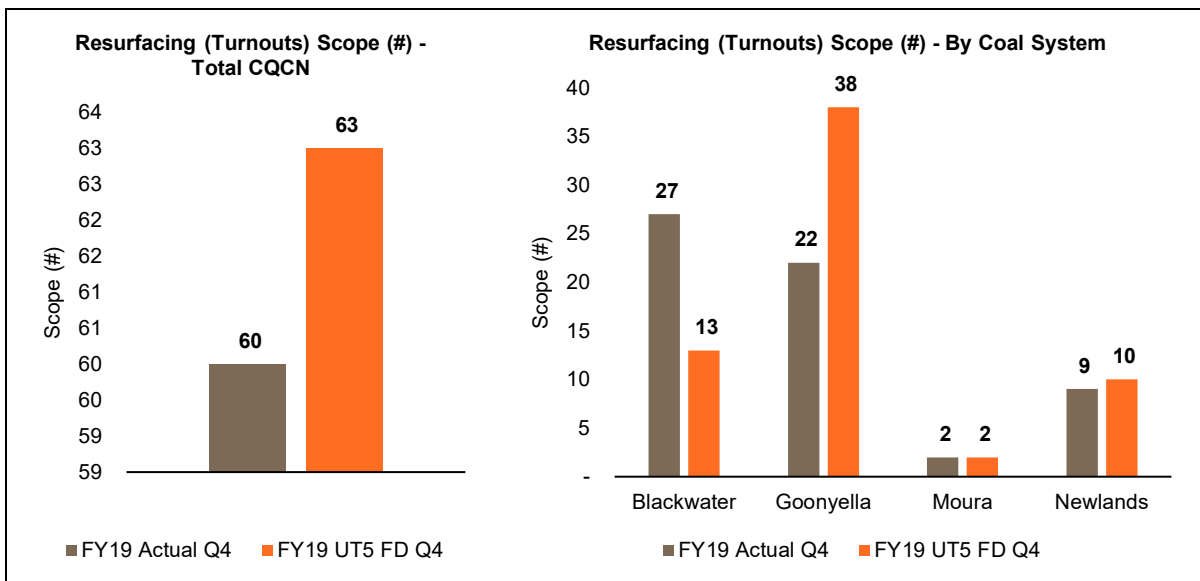


Figure 20 - Resurfacing (Turnouts) by System

During the Reporting Period, Aurizon Network completed resurfacing works of 60 turnouts; 3 turnouts less than the UT5 Final Decision equivalent. Additional scope was achieved in the Blackwater system to rectify defects identified by the track recording vehicle.