



Aurizon Network FY2022 Capital Expenditure Claim

Prepared by Aurizon Network
September 2022



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1. Executive Summary

Aurizon Network Pty Ltd (**Aurizon Network**) welcomes the opportunity to submit to the Queensland Competition Authority (**QCA**) its capital expenditure claim (**Capex Claim**) for the Financial Year ending 30 June 2022 (**FY22**). This submission provides evidence to support the QCA's prudence and efficiency assessment of the FY22 Capex Claim and the subsequent inclusion of Aurizon Network's capital expenditure into the Regulatory Asset Base (**RAB**).

Aurizon Network notes that the FY22 Capex Claim follows the collaborative provisions of the QCA approved 2017 Access Undertaking (**UT5**). It should be noted that Aurizon Network's FY22 Renewals Strategy and Budget (**Approved RSB**) was approved by the Rail Industry Group (**RIG**) on 14 February 2021 for the Blackwater, Goonyella and Moura Coal Systems in the Central Queensland Coal Network (**CQCN**). While the FY22 RSB for the Newlands Coal System and Goonyella to Abbot Point Expansion (**GAPE**) was not approved by the RIG, Aurizon Network confirms that it implemented its final draft RSB, i.e. the Interim Renewals Strategy and Budget (**Interim RSB**) in accordance with clause 7A.11.3(m)(iii). The Capital Indicator associated with the Interim RSB for Newlands and GAPE was approved by the QCA on 22 June 2021 in its decision on the FY22 Annual review of Reference Tariffs. Throughout FY22, Aurizon Network has sought wherever reasonably possible to deliver asset replacement and renewals activity in each Coal System in a manner that is consistent with either the Approved RSB or (where relevant) the Interim RSB.

This submission seeks QCA approval of Aurizon Network's FY22 Asset Replacement and Renewal Expenditure (**Renewals Capex Claim**) of \$253.7m including Interest During Construction (**IDC**). This submission:

- i. demonstrates the extent to which Aurizon Network's capital expenditure and scope of work is consistent with the Approved RSB for each Coal System;
- ii. seeks QCA approval of additional costs where the Renewals Capex Claim departs from the Approved RSB for each Coal System in accordance with Clause 7A.11.6 (b)(iv)(B); and
- iii. seeks QCA approval for the prudent and efficient value of the applicable assets where Aurizon Network's capital expenditure and scope of work was part of an Interim RSB or not included in the Approved RSB for any Coal System in accordance with Clause 2.2 of Schedule E of UT5.

Capitalised terms in this submission have the meaning given in UT5, unless otherwise defined.

Table 1 Renewals Capex Claim by Coal System

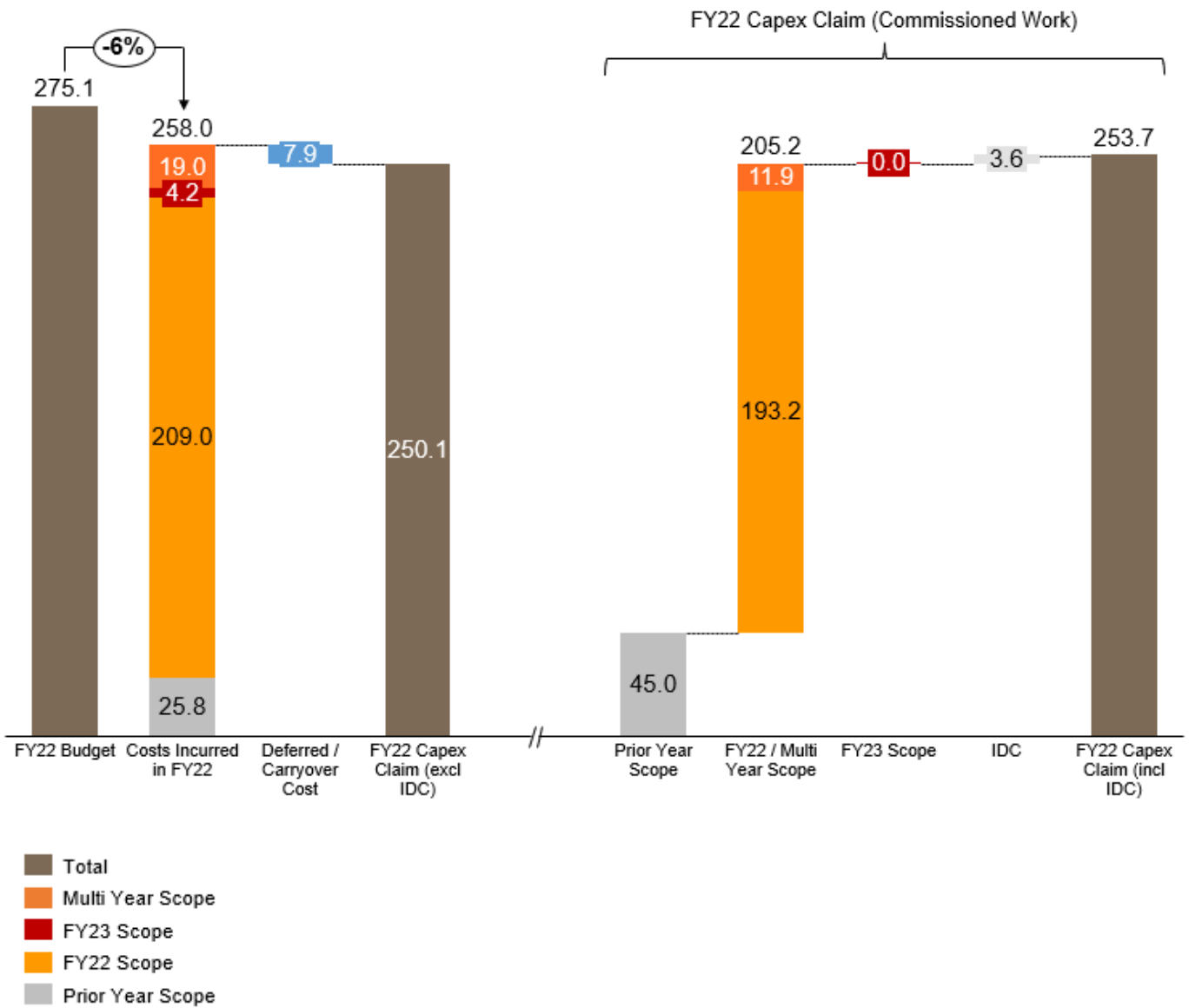
Coal System	Approved RSB (\$m)	Capex Incurred (\$m)	Variance (\$m)	Capex Claim excluding IDC (\$m)	Capex Claim including IDC (\$m)
Blackwater	117.1	117.8	0.7	111.2	112.6
Goonyella	120.9	102.0	(18.9)	97.9	99.2
Moura	11.8	15.0	3.2	18.2	18.8
Newlands / GAPE	25.3 [^]	23.2	(2.1)	22.8	23.0
Total CQCN	275.1	258.0	(17.1)	250.1	253.7

[^] As per the Interim Renewals Strategy and Budget.

Figure 1 FY22 Renewals Program provides a comparison between the FY22 Approved RSB, or Interim RSB where applicable, and the FY22 capex claim including a break-down of total claimed costs for each Coal System.

Figure 1 FY22 Renewals Program

Total CQCN



^Please note that the FY22 Capex (Incurred) value presented in Figure 1 FY22 Renewals Program differs slightly from the value presented in Table 1 Renewals Capex Claim by Coal System above due to rounding.

2. Introduction

Aurizon Network is the accredited Rail Infrastructure Manager (**RIM**) of the 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 GAPE.

The approval of UT5 in the form agreed with customers, provided a unique opportunity for Aurizon Network and its customers to adopt a new approach to working together; one that promotes greater collaboration and creates mutually beneficial outcomes. A key aspect of the arrangements is the opportunity to enable greater customer involvement in the development and assessment of Aurizon Network's RSB on an annual basis for each Coal System.

On 14 February 2021, the Chair of the RIG advised Aurizon Network that "a Special Majority of End Users for each of the Moura, Blackwater, and Goonyella Coal Systems approved the final Renewals Strategies and Budgets" but that the RSB for the Newlands System and GAPE was not approved. Aurizon Network subsequently submitted its final draft RSB as the Interim RSB for the Newlands System and GAPE and sought QCA approval of the associated Capital Indicator through the FY22 Annual review of Reference Tariff process. The QCA granted approval of the Newlands and GAPE Capital Indicator through this process on 22 June 2021.

Aurizon Network has sought to implement the FY22 Approved RSB or Interim RSB for each Coal System and has delivered the renewals program in a manner that has had regard to the UT5 Maintenance Objectives in terms of:

- 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 cost and scope variances do exist for some items when compared to the relevant RSB. Aurizon Network considers that the information included within this submission and within the supporting documentation provided to the QCA demonstrates that these variations were prudent and efficient and should be approved for inclusion in the RAB.

2.1 Renewals Capex Claim

Aurizon Network submits for QCA approval, its Renewals Capex Claim for FY22, which details the:

- expenditure incurred;
- scope of works undertaken; and
- procurement strategy and methodology used.¹

Aurizon Network has sought to deliver the FY22 asset renewals program consistent with:

- the Approved RSBs, which provided pre-approval for a forecast spend of \$249.8m for the Blackwater, Goonyella and Moura Systems; and
- the Interim RSB for Newlands and GAPE which provided for a forecast spend of \$25.3m.

This represented a total forecast spend for the CQCN of \$275.1m in aggregate.

¹ Clause 7A.11.6 (a) of UT5

Aurizon Network incurred total capital expenditure of \$258.0m during FY22; \$17.1m lower than the aggregated budget. It should be noted that variances from the Approved RSB and Interim RSBs have been communicated to the Rail Industry Group (**RIG**) through quarterly meetings and reports.

The FY22 Renewals Capex Claim reflects the value of assets commissioned during the year. Aurizon Network successfully commissioned a multitude of asset replacement and renewal activities throughout the CQCN, representing a total value of **\$250.1m** excluding IDC (**\$253.7m including IDC**). For each coal system:

- Blackwater System – the Approved RSB provided a budget of \$117.1m. Aurizon Network incurred capital expenditure of \$117.8m, of which \$112.6m (including IDC) is being submitted in this FY22 Capex Claim.
- Goonyella System - the Approved RSB provided a budget of \$120.9m. Aurizon Network incurred capital expenditure of \$102.0m, of which \$99.2m (including IDC) is being submitted in this FY22 Capex Claim.
- Moura System - the Approved RSB provided a budget of \$11.8m. Aurizon Network incurred capital expenditure of \$15.0m, of which \$18.8m (including IDC) is being submitted in this FY22 Capex Claim.
- Newlands System and GAPE - the Interim RSB provided a budget of \$25.3m. Aurizon Network incurred capital expenditure of \$23.2m, of which \$23.0m (including IDC) is being submitted in this FY22 Capex Claim.

The scope of works delivered by Aurizon Network during FY22 is comprised of:

- FY22 scope planned in accordance with the Approved RSB and Interim RSB;
- scope originally planned for delivery in FY21, but subsequently deferred to FY22; and
- additional (or substitute) scope that has been identified during FY22 as requiring prioritisation.

There were a number of successes in the delivery of the FY22 renewals program. Aurizon Network's engineering, planning and delivery teams continued to see savings in the delivery of the optical fibre renewals due to works being contracted at a lower rate than was assumed in the budget. Additionally, the Level Crossing program delivered the entire planned RSB scope across all systems, the Structures program in Newlands System and the Electrical program in Blackwater System both completed additional scope at no additional cost, and the Corridor Asset program was below budget in costs in every system.

Throughout FY22, the weather impacted Aurizon Network's ability to deliver some of the planned scope with all systems experiencing periods of considerable wet weather. As noted in the Q4 RIG Quarterly Report², seven out of the 12 months in FY22 saw higher than average rainfall, with the months of November and May seeing very high rainfall. The impact of this increase in rainfall was felt across many of the renewal categories including Track Renewals, Formations, Control Systems and Ballast works. The wet weather saw lower production levels, an increase in reactive works and costs, as well as increased safety risks.

The FY22 Renewals Program was also delivered during a period characterised by the ongoing uncertainty associated with the global pandemic (**COVID-19**) with restrictions and lockdowns continuing into the third quarter of FY22. This impacted the mobilisation of both internal and external resources. These challenges were also present in FY21 and as a result, some of the FY22 renewals programs were reprioritised in order to deliver FY21 scope that had been deferred. Labour constraints continued through FY22 with some FY22 scope being deferred to free up resources to deliver scope that was deferred from FY21. In some instances, the supply chain for some materials also experienced constraints. Renewals including Control Systems and Structures encountered some challenges due to global supply chain issues, extended material delivery times and increasing costs.

Additional commentary outlining Aurizon Network's performance against the Approved RSB or Interim RSB can be found in the section for each individual Coal System.

² Refer Q4 RIG Report | Appendix A – Monthly Rainfall for the financial year to date compared to historical averages

3. Assessment of the Renewals Capex Claim

3.1 UT5 Requirements

This submission provides the QCA with the details of capital expenditure that Aurizon Network considers should be included in the RAB. There are two criteria within UT5 that the QCA must have regard to when assessing and approving the Renewals Capex Claim. Specifically:

Where Capital Expenditure is consistent with the Approved RSB:

The QCA must determine the extent to which the FY22 Renewals Capex Claim is **consistent with** the FY22 Approved RSB for each Coal System in line with Clause 7A.11.6 (b)(iii). To the extent that the FY22 Renewals Capex Claim for a Coal System is **consistent with** the applicable Approved RSB, the relevant End Users are deemed to support the relevant elements of the Renewals Capex Claim. Accordingly, the QCA will approve the Renewals Capex Claim.

Where Capital Expenditure departs from the Approved RSB or where there is an Interim RSB:

The QCA must determine the extent to which the FY22 Renewals Capex Claim **departs** from the FY22 Approved RSB for each Coal System in line with clause 7A.11.6 (b)(iv). To the extent that the FY22 Renewals Capex Claim for a Coal System **departs** from the applicable Approved RSB, the QCA will determine whether those additional costs specified are prudent and efficient. Where there is an Interim RSB, the QCA must, in accordance with clause 7A.11.6(c), approve a Renewals Capex Claim to the extent that the expenditure is prudent and efficient.

In determining the prudence and efficiency of capital expenditure, the QCA must have regard to the following three matters outlined in Clause 2.2 of Schedule E of UT5:

SCOPE	STANDARD	COST
<ul style="list-style-type: none">• Scope of works for the project, including whether the requirement for the works is prudent and efficient.	<ul style="list-style-type: none">• Standard of works, including whether the standard could be expected to deliver the requirements for that project without it being oversized or likely to deliver a capital works project which is beyond the requirements of its scope.	<ul style="list-style-type: none">• Costs of that project are prudent and efficient, having regard to the scope and standard of work undertaken or to be undertaken for the project, which must include having regard, where relevant, to a list of factors for each element of scope, standard and cost.

The QCA must assess, in accordance with Clause 2.2(b) of Schedule E of UT5, whether the capital expenditure is prudent and efficient and in doing so, must consider only the circumstances relevant at the time of making the decision to incur the capital expenditure (or in relation to assessing prudence of costs, at the time when the costs were incurred, or the capital expenditure project was undertaken, as applicable).

3.2 Demonstrating consistency with the Approved RSB

Aurizon Network has provided a comparison of actual cost incurred and scope delivered against the Approved RSB for each Coal System. This information is presented in each individual Coal System section of this submission and is aligned to the information voluntarily provided to the RIG in Quarterly Reports.

Clause 1.3(a)(ii) of Schedule E of UT5 allows Aurizon Network to submit the costs of assets that were *commissioned* during the year to the QCA for approval within the annual Capex Claim. Aurizon Network has included additional

information to clearly outline the capital expenditure that has been *incurred* during the year versus what it is seeking to claim (commissioned assets) and include in the RAB.

To support the QCA’s assessment of the Renewals Capex Claim, Aurizon Network has prepared End of Financial Year Status Reports (**EOFY Reports**) for the 10 categories of asset renewal activities identified in the Approved RSB. These EOFY Reports:

- articulate the extent to which scope and cost is consistent with the Approved RSB for each system;
- identify departures from the Approved RSB; and
- provide supporting commentary or evidence to justify the prudence and efficiency of any variations.

The 10 categories of asset renewal activities with EOFY Reports are:

EOFY Report	Activities Included
1.Track Renewal	Rail Renewal Sleeper Renewal Track Upgrade Permanent Way Other
2.Turnouts	Turnout Renewal Turnout Components Turnout Design
3.Ballast Undercutting	Mainline Undercutting Turnout Undercutting GPR
4.Bridge Ballast	Bridge Rollout
5.Structures	Bridges Culvert Renewal Culvert Design
6.Formations	Formation Renewal Formation Reactive
7.Level Crossings Renewals	Level Crossing Renewal Level Crossing Design Level Crossing Other
8. Corridor Assets	Access Points and Access Roads Corridor Fencing and Security
9.Control Systems	Safe working – Asset Protection Safe working – Interlocking Safe working – Train Detection Safe working – Minor Power Resilience Telecommunications Assets Transmission and Data Renewal UTC/DTC System Upgrades Other Control System Renewals
10.Electricals	Overhead Line Equipment Power Systems

3.3 Demonstrating prudence and efficiency of the Renewals Capex Claim

As per Clause 7A.11.6(b)(iv), to the extent that a Renewals Capex Claim for an Individual Coal System departs from the applicable Approved RSB, the QCA must assess any additional costs specified within the Renewals Capex Claim. The QCA must approve Aurizon Network's additional costs to the extent they are prudent and efficient.

As per Clause 7A.11.6(c), where there is no Approved RSB for a Coal System for the Year, the QCA must approve a Renewal Capex Claim to the extent that the expenditure specified in the Renewals Capex Claim is prudent and efficient.

In both cases, the QCA will assess the relevant costs in accordance with Clause 2.2 of Schedule E to UT5.

Aurizon Network has sought to identify, for each of the Blackwater, Goonyella and Moura Coal Systems, capital expenditure that has departed from the Approved RSB. For the Newlands Coal System and GAPE, Aurizon Network's Renewals Capex Claim is compared to the Interim RSB.

3.3.1 Aurizon's Enterprise Investment Framework supports prudent and efficient investments

As detailed in the FY21 Capital Claim³, Aurizon Network adheres to the Aurizon Enterprise Investment Framework (**Framework**). In addition to that Framework, Aurizon Network has its own internal governance requirements which ensures the appropriate review and approvals from Network Finance, Network Operations, Network Assets and ultimately the Network Group Executive. The overall Framework is a rigorous process undertaken prior to the commitment of capital investments. The purpose of the Framework is to facilitate sound investment decisions and to ensure that:

- Investments have a high degree of success;
- Investment decisions are made on a consistent basis;
- Capital is optimised; and
- Learnings from past investments are recorded and taken into consideration as part of Aurizon Network's commitment to continuous improvement.

An Investment Approval Request (**IAR**) was provided to the relevant members of the Network Leadership Team (**NLT**) and ultimately the Aurizon Investment Committee (**AIC**) for review and endorsement.

The Framework and supporting documentation are informed by the requirements of UT5 and promotes the prudence and efficiency of scope, standard and cost for capital expenditure. To inform and assist the internal governance process, Aurizon Network also had regard to the FY22 Renewals and Strategies Budget for each individual Coal System and the associated Capital Indicators which were ultimately approved by the QCA in its decision on the FY22 annual Review of Reference Tariffs.

3.3.2 Documentation available to demonstrate prudence and efficiency

Aurizon Network has prepared comprehensive documentation to support the QCA's assessment of prudence and efficiency of the scope, standard and cost for the capital expenditure which departs from the Approved RSB or where there is an Interim RSB. This documentation is outlined in Table 2 below and can be provided to the QCA on request.

³ <http://www.qca.org.au/wp-content/uploads/2021/09/aurizon-network-2020-21-capital-expenditure-claim.pdf>

Table 2 Supporting documents available with this submission

Document	Scope	Standard	Cost
FY22 Renewals Strategy & Budget	✓	✓	✓
End of Financial Year (EOFY) Status Reports	✓	✓	✓
Capital Expenditure Workbook			✓
Quarterly Reports FY22 Q1-Q4	✓		✓
FY22 – Detailed Scope Report for Q4	✓		
Movement Planner IAR and Project Completion Report	✓	✓	✓
APS Augmentation IAR and Project Completion Report	✓	✓	✓
Feasibility Investment Approval Request -ODCN	✓	✓	✓

3.4 Identification of Capital and Operating Expenditure

Aurizon Network’s approach to identifying capital expenditure is generally aligned to the Australian Accounting Standard AASB 116 Property, Plant and Equipment. This approach ensures that costs categorised as operating expenditure are not included within the Renewals Capex Claim.

Those costs which have been categorised as capital expenditure for work commissioned in FY22 are contained within this submission for inclusion in the RAB. For the FY22 Renewals Capex Claim, Aurizon Network has identified commissioned assets as those that were installed and ready for use on or before 30 June 2022.

Clause 1.3(a)(ii) of Schedule E of UT5 allows Aurizon Network to claim the costs of commissioned assets during the year within the annual Capex Claim. The Approved RSB and Interim RSB, however, reflect that renewal spend expected to be incurred during the year. Aurizon Network has included additional information within this submission to reconcile the total costs that have been incurred during the year with the costs that have been included in the Capex Claim (i.e. commissioned assets) for subsequent inclusion in the RAB.

3.5 Interest During Construction (IDC)

Aurizon Network’s approach to calculating IDC is consistent with the methodology that has been approved by the QCA since 2010. The regulatory model assumes that all capital expenditure is included in the RAB in the middle of the relevant financial year. IDC is therefore calculated up to and including the mid-point of the year in which the project was commissioned. For capital expenditure commissioned in FY22, the mid-point is 31 December 2021.

IDC is calculated using an S-curve methodology, whereby monthly cash flow values are multiplied by the applicable interest rate. The monthly cash flows for each project are extracted from Aurizon Network’s financial accounting system (SAP). The applicable interest rate is the weighted average cost of capital (WACC) for the relevant year within the regulatory period. On 12 November 2021, Aurizon Network provided the Chair of the RIG and the QCA its preliminary response to the Independent Expert’s Initial Capacity Assessment Report (ICAR), which set out the proposed options to address the capacity deficits identified by the Independent Expert in the ICAR. Consistent with the definition of the term “Report Date” in UT5, this notification to the Chair of the RIG on 12 November 2021 triggered an increase in the WACC from 5.9% to 6.3%. As a result, Aurizon Network has applied a composite WACC of 6.15% to calculate IDC associated with the FY22 Capex Claim.

3.6 Key Terminology

3.6.1 Costs Incurred

Costs incurred refer to costs that Aurizon Network has incurred when delivering capital expenditure works throughout the year. For clarity, where there is an Approved RSB, incurred costs are the key measure for determining consistency with the Approved RSB for each Coal System.

3.6.2 Costs Claimed

Clause 1.3(a)(ii) of Schedule E of UT5 requires that Aurizon Network claim costs associated with assets that have been commissioned during the year. Please note that the value of Aurizon Network's Renewals Capex Claim may also include costs incurred in a prior year that were unable to be claimed because the asset was not commissioned in the prior year.

3.6.3 Scope achieved

Scope achieved refers to scope undertaken throughout the year and is reflective of the costs incurred and costs claimed.

In accordance with Clause 7A.11.6(a)(i)-(iii) of UT5, Aurizon Network has provided a summary of costs incurred and scope achieved in the Blackwater, Goonyella, Moura, Newlands system and GAPE outlining where Aurizon Network has remained consistent with or has departed from the Approved RSB or Interim RSB as applicable. For further details on the scope of work Aurizon Network completed during FY22 (relating to both FY22 RSB and other scope items), please refer to the supporting documentation provided to QCA staff.

Aurizon Network has also included waterfall graphs in Appendix B to assist with the comparison of actual incurred asset renewals expenditure and the value of commissioned assets for each program that is included within this submission.

Throughout the year, Aurizon Network has communicated changes and variations with the Approved RSB and Interim RSBs to the RIG through the provision of Quarterly Reports. The following sections summarise Aurizon Network's asset replacement and renewals performance for the year by Individual Coal Systems. Please note that the totals presented in the tables below may not add due to rounding.

4. Blackwater System

4.1 Cost Incurred and Scope Achieved for the year

Please refer to Table 3 for details of the costs incurred and scope achieved for each item, within the Blackwater system. Aurizon Network considers that its performance should be assessed as consistent where costs are in line with or below the Approved RSB and/or the scope delivered is equal to or more than the Approved RSB.

Table 3 Blackwater System Costs Incurred & Scope achieved for the year

Renewal Item	Note	Cost (\$m)	Budget (\$m)	Var	Scope	Budget	Var
		FY	FY		FY	FY	
Track Renewal	1	24.7	22.9	1.8			
Rail Renewal		10	9.7	0.3	14.1	12.3	1.8
Sleeper Renewal		3.6	4	(0.4)	1.5	5.8	(4.3)
Track Upgrade		10.3	8.8	1.5	7.4	6.5	0.9
Permanent Way Other		0.8	0.4	0.4			
Turnouts	2	5.8	7.6	(1.8)			
Turnout Renewal		3.5	4.1	(0.6)	1	4	(3)
Turnout Components		2.2	2.8	(0.6)			
Turnout Design		0.1	0.7	(0.6)			
Ballast Undercutting	3	33.8	35.6	(1.8)			
Mainline Undercutting		31.1	32.8	(1.7)	50.7	66.5	(15.8)
Turnout Undercutting		2.3	2.2	0.1	18	17	1
GPR		0.4	0.6	(0.2)			
Bridge Ballast	4	3.8	3.2	0.6			
Bridge Rollout		3.8	3.2	0.6	7	7	--
Structures	5	11.5	9.5	2			
Bridges		--	--	--			
Culvert Renewal		10.7	8.7	2	19	20	(1)
Culvert Design		0.8	0.8	0			
Formations	6	4.1	5.4	(1.3)			
Formation Renewal		2.9	4.2	(1.3)	1.2	1.7	(1)
Formation Reactive		1.2	1.2	0			
Level Crossings	7	3	2.1	0.9			
Level Crossing Renewal		2.6	1.6	1	4	2	2
Level Crossing Design		0.3	0.1	0.2			
Level Crossing Other		0.1	0.4	(0.3)			
Corridor Assets	8	0.9	1.2	(0.3)			
Access Points and Access Roads		0.5	0.9	(0.4)			
Corridor Fencing and Security		0.4	0.3	0.1			
Control Systems Assets	9	22.3	20.3	2			
Safe working - Asset Protection		1.7	0.5	1.2	1	1	--
Safe working - Interlocking		5.3	3	2.3	3	3	--
Safe working - Train Detection		5.9	4.9	1	3	3	--
Safe working - Minor		0.1	0.6	(0.5)			

Renewal Item	Note	Cost (\$m)	Budget (\$m)	Var	Scope	Budget	Var
Power Resilience		0	0.1	(0.1)	--	2	(2)
Telecommunication Assets		3.1	5.3	(2.2)	10.3	39.6	(29)
Transmission and Data Renewal		4.6	3.2	1.4	30	19	11
UTC/DTC System Upgrades		0.9	1.3	(0.4)	9	12	(3)
Other Control Systems Renewals		0.7	1.4	(0.7)	3	4	(1)
Electrical Traction Assets	10	5	6	(1)			
Overhead Line Equipment		1	1.7	(0.7)	1	3	(2)
Power Systems		4	4.3	(0.3)	60	51	9
Technology	11	3.1	3.3	(0.1)			
NAMS		--	1.1	(1.1)			
ATIS		1.4	0.3	1.1			
Movement Planner		0.7	1.9	(1.2)			
RSB Total		116.7	117.1	1.1			
Non – RSB Technology		1.1	-	1.1			
Non-RSB ODCN		0.1	-	0.1			
Non-RSB APS Augmentation		1.0	-	1.0			
Total		117.8	117.1	1.8			

Variation Commentary:

1. Track Renewal:

During FY22, Aurizon Network incurred \$24.7m delivering the track renewal activities in the Blackwater System, compared to the approved budget of \$22.9m; a variance of \$1.8m. Rail renewal and track upgrade activities included 4 additional scope items that were added due to track inspections identifying accelerated wear. This drove an increase in costs incurred compared to budget. Sleeper renewal scope was not completed mainly due to the cessation of coal railings on the Minerva line which meant that planned scope was no longer applicable to Regulated Asset Base and has therefore been removed from scope. This was partially offset by additional sleeper renewals taking place on the Koorilgah branch to allow for recommencement of railings. Please note, the Koorilgah sleeper renewal was reported in number of sleepers renewed across a 7 km section of track. The RSB measured Sleeper Renewals in track km. As these units are not the same the Koorilgah sleeper renewal is not included in the Scope FY column in Table 3, however the costs are included in the Cost FY column and have been included in the claim amount for FY22.

2. Turnout Renewal:

Aurizon Network delivered \$5.8m of turnout renewal activities in the Blackwater System, compared to the approved budget of \$7.6m; a variance of -\$1.8m. During FY22, Aurizon completed the turnout ER1 at Wallaroo that was being managed through component replacement which was no longer viable. This site was not in the RSB, however, RIG representatives provided their support for this replacement at the monthly Producer meeting in December 2021. Further work on the signalling component will be completed in FY23 as included in the FY23 RSB. The planned FY22 scope was deferred due to issues related to design review, landholder access issues and insufficient possession hours. Additionally, scope at Callemondah that had been deferred from FY21 has been deferred to FY24 to allow for completion of staging works related to power pole relocation and embankment removal. The FY22 Capex Claim also includes \$0.8m of costs relating to final costs settlements for works completed in FY21.

3. Ballast Undercutting:

The FY22 RSB was developed on the basis that mainline undercutting would be completed by a dual ballast cleaning machine (**BCM**) delivery model from Q4 of FY22. Following consultation with the RIG, the decision was made not to proceed with this delivery model which required a variation to the planned scope. This resulted in a revision of mainline undercutting budgeted scope from 66.5km to 60.6km. This also resulted in a revision of turnout undercutting budgeted scope from 17 units to 19 units. The total revised budget changed from \$35.6m to \$31.1m. During FY22, Aurizon Network delivered 50.7km of mainline undercutting scope, representing a shortfall of 9.9km relative to the revised budgeted scope.

Other factors that impacted scope completion included resource availability driven by COVID-19, an offsite safety incident which resulted in the cancellation of works, partial completion of scope in January due to high temperatures (42 degree Celsius), and the impact of wet ballast conditions. For ballast undercutting works, Aurizon Network's costs are materially fixed and do not vary directly in line with variances to the scope.

4. Bridge Ballast:

During FY22, Aurizon Network successfully completed the equivalent of 100% of the Bridge Ballast scope planned in the Blackwater System. Actual costs incurred were higher than budget as the actual scope was reprioritised to allow for the substitution of works at Boats Creek Bridge in place of works at Hut Creek as the condition of Boats Creek Bridge resulted in a speed restriction being imposed until the ballast renewal was completed. In order to minimise the constraints on capacity caused by the speed restriction, the decision was made to prioritise this work at Boats Creek Bridge.

5. Structures:

During FY22, Aurizon Network completed Structures renewals equivalent to 95% of the planned scope. The planned renewals scope was impacted by the requirement to defer five FY22 scope renewals while also completing four culvert renewals that were carried over from FY21. Of the sites that were deferred to future years, one was due to unidentified cables located pre-construction that were not detected during safety processes (Dial Before You Dig). A delay in steel structure manufacturing impacted the ability to deliver two other culvert renewals. Additionally, two culverts on the section from Burngrove to Nogoia have been removed from the RSB as they are no longer coal related assets due to the cessation of any mining along this section. Aurizon Network incurred higher than budgeted costs due to design costs for future years being brought forward. This will help Aurizon Network's efforts to improve scope definition which leads to more precise planning outcomes, thus reducing variability in execution and improved delivery of scope against the Approved RSB.

6. Formations:

During FY22, Aurizon Network completed 75% of the Formation Renewal scope projects in the Blackwater System and incurred 75% of the budgeted costs. The remaining 25% of the scope has been deferred to FY23 with scope delivery impacted by wet weather during the planned closure in which the works were due to take place.

7. Level Crossings:

Aurizon Network completed twice as many Level Crossing renewals in the Blackwater System than planned in the RSB. Higher than planned costs were incurred given the additional scope items that were completed in FY22. This included the renewal at Ardurad Road which was required as part of the Department of Transport and Main Roads (**DTMR**) "Safer roads sooner" programme which called for a new traffic light system to be installed at the intersection very close to the level crossing. The upgrade was required in order to integrate the road traffic lights with the active protection at the level crossing to prevent traffic from queuing across the level crossing. Additional scope was also completed to enable a landowner to access their property.

8. Corridor Assets:

As indicated in Table 3, there was no planned scope for Corridor Assets renewals in the Blackwater system and incurred costs equalled 75% of the budgeted costs for fix on fail works.

9. Control Systems:

During FY22, variations to the Blackwater Control Systems scope when compared against the RSB were due to the following:

- **Asset Protection:** The increase in Asset Protection costs was due to the reprioritisation of scope. The Kinrola weighbridge replacement was brought forward from a future year and the planned FY22 Rolleston weighbridge replacement scope was deferred to FY23. This was due to the weighbridge at Kinrola showing signs of deterioration at a rate faster than expected. The increased costs against the approved budget were as a result of concreting and track work that was not budgeted for.
- **Interlocking:** While the overall interlocking scope was achieved, costs incurred were higher than budget. This was due to the reprioritisation of scope that was deferred from FY21. As a result of the reprioritisation, the scope locations within the FY22 RSB were deferred. The main challenge impacting delivery of the Interlocking program was resourcing to support design and construction works.
- **Train Detection:** Costs for Train Detection renewals were higher than budget due to reprioritisation of FY21 scope that had been deferred.
- **Minor Works:** Similar to the other categories, Minor works experienced delays due to resourcing and material supply delays.
- **Power Resilience:** Aurizon Network was unable to complete the scope for Power Resilience in Blackwater due to delays in battery procurement. As a result, all previously deferred FY21 and FY22 scope has been deferred.
- **Telecommunications Assets:** The variance to the Telecommunications Assets scope delivered against scope planned is primarily due to 22.2km of scope that is awaiting final commissioning. Accordingly, this scope has not yet been included within the scope column. FY22 is the second year of a multi-year programme to replace the remaining life expired optical fibre cables. As a result of engagement during the tender process, scope was brought forward from future years into FY22. Planned installation works were disrupted by a combination of wet weather and site supervision resource constraints.
- **Transmission & Data:** The additional cost incurred compared to the budget was attributable to additional scope delivered in FY22. This additional scope completed was FY21 scope that was impacted by a COVID-19 supply delay as well as unavailability of supervisory resources in FY22.
- **UTC/DTC System Upgrades:** The planned scope for FY22 was primarily impacted by the unavailability of design resources.
- **Other Control System Renewals:** The planned scope for FY22 was impacted by the deferred FY21 scope which was reprioritised to FY22.

10. Electrical:

During FY22, Aurizon Network incurred \$5.0m delivering electrical renewal activities in the Blackwater System, compared to the approved budget of \$6.0m; a variance of -\$1.0m. The variance is primarily due to the OHLE scope was not fully completed due to delays obtaining detectors which has resulted in some of this work being deferred to FY23. Additionally, the Power Systems completed more scope than budgeted mainly due to deferred FY21 scope being completed in FY22.

11. **Technology:** Variations to the Technology category, including costs incurred as a result of projects not included in the RSB, are discussed in section 8.

4.2 Cost Incurred versus Claimed Amount

In line with Clause 1.3(a)(ii) of Schedule E of UT5, please refer to Table 4 below for details of the costs incurred for the year versus the claimed amount for the Blackwater System.

Table 4 Blackwater System Costs Incurred versus Claimed Amount

Item	Total Costs Incurred in FY22 (\$m)	FY22 Scope Claimed in FY22 (\$m)	Prior Year Scope Claimed in FY22 (\$m)	Future Year / Multi-Year Scope Claimed in FY22 (\$m)	Total Claimed Expenditure (\$m)	IDC (\$m)	Total Claimed Amount including IDC (\$m)
Track Renewal	24.7	23.6	0.6	-	24.0	0.2	24.1
Turnouts	5.8	3.0	0.8	-	3.8	0.1	3.9
Ballast Undercutting	33.9	33.6	0.1	-	33.7	0.0	33.7
Bridge Ballast	3.8	3.8	-	-	3.8	0.0	3.8
Structures	11.4	7.1	4.5	-	11.7	0.2	12.0
Formation Renewal	4.1	3.5	0.3	-	3.8	0.0	3.9
Level Crossing Renewal	2.9	2.4	0.3	-	2.8	0.0	2.8
Corridor Assets	0.9	0.4	0.4	-	0.8	0.0	0.9
Control Systems Assets	22.2	4.1	3.8	11.3	19.2	0.7	19.8
Electrical Assets	5.0	2.0	1.9	-	3.9	0.1	4.0
Technology	3.1	2.3	1.5	-	3.8	0.1	3.8
Total	117.8	85.8	14.2	11.3	111.2	1.4	112.6

5. Goonyella System

5.1 Cost Incurred and Scope Achieved for the Year

Please refer to Table 5 for details of the costs incurred and scope achieved within the Goonyella system. Aurizon Network considers that its performance should be assessed as consistent where costs are in line with or below the Approved RSB and/or the scope delivered is equal to or more than the Approved RSB.

Table 5 Goonyella System Costs Incurred & Scope achieved for the Year

Renewal Item	Note	Cost (\$m)		Var	Scope		Var
		FY	FY		FY	FY	
Track Renewal	1	29.2	32.1	(2.9)			
Rail Renewal		9.0	10.4	(1.4)	13.5	13.4	0.1
Sleeper Renewal		0.1	0.7	(0.6)	--	1.2	(1.2)
Track Upgrade		19.3	20.6	(1.3)	13.1	15.2	(2.1)
Permanent Way Other		0.8	0.4	0.4			
Turnouts	2	3.2	5.3	(2.1)			
Turnout Renewal		0.6	2.1	(1.5)	1.0	3.0	(2.0)
Turnout Components		2.1	2.8	(0.7)			
Turnout Design		0.5	0.4	0.1			
Ballast Undercutting	3	33.6	34.7	(1.1)			
Mainline Undercutting		30.2	31.1	(0.9)	45.5	65.2	(19.7)
Turnout Undercutting		3.0	3.0	0.0	20.0	23.0	(3.0)
GPR		0.4	0.6	(0.2)			
Bridge Ballast	4	1.9	1.8	0.1			
Bridge Rollout		1.9	1.8	0.1	3.0	4.0	(1.0)
Structures	5	3.3	5.4	(2.1)			
Bridges		--	--	--			
Culvert Renewal		3.0	5.3	(2.3)	4.0	8.0	(4.0)
Culvert Design		0.3	0.1	0.2			
Formations	6	5.9	6.5	(0.6)			
Formation Renewal		4.7	4.7	0.0	0.5	1.3	(1)
Formation Reactive		1.2	1.8	(0.6)			
Level Crossings	7	2.8	2.2	0.6			
Level Crossing Renewal		2.8	1.7	1.1	3.0	3.0	--
Level Crossing Design		0.0	0.1	(0.1)			
Level Crossing Other		0.0	0.4	(0.4)			
Corridor Assets	8	0.5	0.9	(0.4)			
Access Points and Access Roads		0.4	0.6	(0.2)			
Corridor Fencing and Security		0.1	0.3	(0.2)			
Control Systems Assets	9	10.8	21.1	(10.3)			
Safe working – Asset Protection		1.3	0.6	0.7	--	2.0	-2.0
Safe working – Interlocking		0.1	--	0.1			
Safe working – Train Detection		1.7	1.5	0.2	3.0	3.0	--
Safe working – Minor		0.2	0.8	(0.6)			
Power Resilience		1.8	1.2	0.6	14.0	12.0	2.0
Telecommunication Assets		2.7	11.7	(9.0)	--	92.8	(92.8)

Renewal Item	Cost (\$m)	Budget (\$m)	Var	Scope	Budget	Var	
Transmission and Data Renewal	2.0	1.9	0.1	53.0	24.0	29.0	
UTC/DTC System Upgrades	0.4	0.8	(0.4)	1.0	2.0	(1.0)	
Other Control Systems Renewals	0.6	2.6	(2.0)	7.0	12.0	(5.0)	
Electrical Traction Assets	10	7.6	7.4	0.2	75.0	61.0	14.0
Overhead Line Equipment	3.9	4.2	(0.3)	9.0	10.0	(1.0)	
Power Systems	3.7	3.2	0.5	66.0	51.0	15.0	
Technology	11	2.1	3.5	(1.3)	0.0	0.0	0.0
NAMS	--	1.1	(1.1)				
ATIS	1.4	0.3	1.1				
Movement Planner	0.8	2.1	(1.3)				
RSB Total	100.9	120.9	(20.1)				
Non-RSB Technology	1.1		1.1				
Non-RSB ODCN	0.1	-	0.1				
Non-RSB APS Augmentation	1.0	-	1.0				
Total	102.0	120.9	(18.9)				

Variation Commentary:

1. Track Renewals:

As indicated in Table 5, Aurizon Network completed approximately 93% of the planned rail renewal and track upgrade scope but did not complete the sleeper renewal scope as planned in the Goonyella System during FY22. \$29.2m of turnout renewal activities in the Goonyella System were delivered, compared to the approved budget of \$32.1m; a variance of -\$2.9m. Aurizon Network was able to remove some track renewal scope due to process improvements that led to a decreased rate of rail acceleration wear. Sleeper renewal scope was deferred to FY24 as this project was planned for interspersed sleeper replacement but will now undertake full sleeper replacement including ballast.

2. Turnouts:

Aurizon Network delivered \$3.2m of turnout renewal activities in the Goonyella System, compared to the approved budget of \$5.3m; a variance of -\$2.1m. The Turnout Renewal program in the Goonyella System was impacted by the deferral of two of the three planned scope items. These two turnouts have been deferred as their inclusion in the FY22 scope was based on a preliminary condition assessment. Upon further review of the sites, it was deemed that the turnouts should be managed through component renewal and maintenance due to the complexity of the renewal and the impact on signalling and the overhead lines that these site renewals would create.

3. Ballast Undercutting:

During FY22, Aurizon Network delivered both scope and cost below the budget amounts as shown in Table 5. Aurizon Network delivered approximately 74% of scope for approximately 97% of the budgeted cost. As a result of the decision not to pursue the Dual BCM operating model, completing the forecast scope required an increase in planned closures. However, due to wet weather throughout the course of the year, a number of planned closures were cancelled and the planned scope was unable to be completed. For ballast undercutting works, Aurizon Network's costs are materially fixed and do not vary directly in line with variances to the scope.

4. Bridge Ballast:

As indicated in Table 5, Aurizon Network completed 75% of the budgeted scope while incurring costs equalling 106% of the budgeted amount. Hughes Creek Bridge has been deferred to FY23 due to wet weather leading

to the cancellation of this work. The costs incurred were higher than budgeted primarily due to crew mobilisation and demobilisation as a result of the wet weather.

5. Structures:

Aurizon Network incurred costs equalling 61% of the budgeted amount and completed 50% of the budgeted scope. Culvert renewals in the Goonyella System were impacted by labour constraints driven by COVID-19 resulting in the deferral of two of the planned culvert renewals. Additionally, scope was also deferred as two culverts could not be renewed without additional design work as they had deteriorated at a rate faster than anticipated. This work will now take place in FY23.

6. Formations:

During FY22, Aurizon Network incurred costs equal to 91% of the budgeted amount while completing two of the four planned renewal projects. Wet weather impacted Aurizon Network's ability to complete these scope items. These scope items have been deferred to FY23. Additional costs were incurred as result of the Black Mountain slope stability project which were as a result of COVID related challenges with contractors travelling from Victoria.

7. Level Crossings:

Aurizon Network completed 100% of the planned Level Crossing scope while incurring costs equalling 127% of the budgeted amount. The budget for the renewal of the level crossing at Goonyella Road was based on the historical average cost of level crossing upgrades. The Goonyella Road site involved added complexities (including a culvert, access road, and multiple closure requirements) that were not reflected in the original cost estimate. Design costs related to FY23 works were also brought forward to FY22 in order to assist with the development of a more accurate FY23 Level Crossing budget.

8. Corridor Assets:

There was no planned scope for Corridor Assets renewals in the Goonyella System and incurred costs equalled 56% of the budgeted amount for fix on fail works.

9. Control Systems:

During FY22, variations to the Goonyella Control Systems scope when compared against the RSB were due to the following:

- **Asset Protection:** The planned asset protection renewals for FY22 have been deferred to FY23. This is a result of one of the scope items being cancelled due to wet weather and the other scope item being impacted by material supply chain delays that forced the work to be rescheduled.
- **Train Detection:** The costs incurred for Train Detection were higher than budget due to the acquisition of additional pinpoint detectors in order to provide sufficient spares to maintain stations within the train detection system.
- **Power Resilience:** The costs incurred for power resilience renewals in FY22 included scope from FY21 that was delayed. As a result of the resources required to deliver the prioritised FY21 deferred scope, three scope items from FY22 have been deferred to FY23.
- **Telecommunications Assets:** Scope delivery for the Telecommunications Assets renewal program has continued to be impacted by wet weather events and resource unavailability driven by COVID-19. The FY22 scope has been deferred to FY23.
- **Transmission and Data Renewals:** Aurizon Network managed to achieve more than double the planned scope while incurring only a slight increase in costs in FY22. The increase in scope was driven by the completion of FY21 scope that had been deferred to FY22 due to a combination of delayed material delivery and lack of availability of suitably qualified design and construction resources.
- **Other Control Systems:** Design work has been delayed.

10. Electrical:

During FY22, Aurizon Network incurred \$7.6m delivering track renewal activities in the Goonyella System, compared to the approved budget of \$7.4m; a variance of \$0.2m. As indicated in the commentary for the Blackwater system, the electrical program was primarily impacted by reprioritisation of FY21 scope that had been deferred, which in turn resulted in the deferral of FY22 scope to future years. The OHLE program had one scope item that has been deferred to FY23 due to resource constraints. Overall, the increased scope was primarily power systems scope which was deferred from FY21 and completed in FY22.

11. Technology: Variations to the Technology category, including costs incurred as a result of projects not included in the RSB, are discussed in section 8.

5.2 Cost Incurred versus Claimed Amount

In line with Clause 1.3(a)(ii) of Schedule E of UT5, please refer to Table 6 for details of the costs incurred for the Year versus the claimed amount for the Goonyella System.

Table 6 Goonyella System Costs Incurred versus Claimed Amount

Item	Total Costs Incurred in FY22 (\$m)	FY22 Scope Claimed in FY22 (\$m)	Prior Year Scope Claimed in FY22 (\$m)	Future Year / Multi-Year Scope Claimed in FY22 (\$m)	Total Claimed Expenditure (\$m)	IDC (\$m)	Total Claimed Amount including IDC (\$m)
Track Renewal	29.1	27.0	1.5	-	28.5	0.2	28.7
Turnouts	3.2	1.8	3.1	-	4.8	0.1	5.0
Ballast Undercutting	33.5	32.3	0.9	-	33.2	0.1	33.3
Bridge Ballast	1.9	1.6	0.1	-	1.7	0.0	1.7
Structures	3.4	0.8	1.0	-	1.9	0.1	1.9
Formation Renewal	5.8	4.7	0.2	-	4.8	0.0	4.9
Level Crossing Renewal	2.9	2.8	0.1	-	2.9	0.0	2.9
Corridor Assets	0.5	0.4	0.0	-	0.5	0.0	0.5
Control Systems Assets	10.7	2.5	4.9	0.2	7.5	0.3	7.8
Electrical Assets	7.6	1.9	3.9	0.5	6.2	0.2	6.4
Technology	3.3	2.5	3.3	-	5.8	0.2	6.1
Total	102.0	78.4	18.9	0.7	97.9	1.4	99.2

6. Moura System

6.1 Cost Incurred and Scope Achieved for the Year

Please refer to Table 7 for details of the costs incurred and scope achieved within the Moura system. Aurizon Network considers that its performance should be assessed as consistent where costs are in line with or below the Approved RSB and/or the scope delivered is equal to or more than the Approved RSB.

Table 7 Moura System Costs Incurred & Scope achieved for the Year

Renewal Item	Note	Cost (\$m)	Budget (\$m)	Var	Scope	Budget	Var
		FY	FY		FY	FY	
Track Renewal	1	2.4	2.7	(0.3)			
Rail Renewal		1.3	1.8	(0.5)	1.7	1.6	0.1
Sleeper Renewal		0.7	0.8	0.0	--	1.3	(1.3)
Track Upgrade		0.3	--	0.3	--	--	--
Permanent Way Other		0.1	0.1	0.1			
Turnouts	2	2.3	1	1.3			
Turnout Renewal		1.7	--	1.7	3	--	3
Turnout Components		0.1	0.6	(0.4)			
Turnout Design		0.5	0.4	0.2			
Ballast Undercutting	3	2	1.9	0.1			
Mainline Undercutting		1.7	1.6	0.1	1.8	3.9	(2.1)
Turnout Undercutting		0.2	0.1	0.0	1	1	--
GPR		0.1	0.2	(0.1)			
Bridge Ballast	4	0.9	0.5	0.4			
Bridge Rollout		0.9	0.5	0.4	2	1	1
Structures	5	2	0.9	1.1			
Bridges		0	--	0.0	1	--	1
Culvert Renewal		1.8	0.7	1.1	7	2	5
Culvert Design		0.2	0.2	0	4	4	--
Formations	6	2.9	1.9	1			
Formation Renewal		1.8	1.2	0.6	0.5	0.5	--
Formation Reactive		1.1	0.7	0.4			
Level Crossings	7	0.6	0.7	0			
Level Crossing Renewal		0.5	0.5	0.1	1	1	--
Level Crossing Design		0.1	0.1	0.0			
Level Crossing Other		--	0.1	(0.1)			
Corridor Assets	8	0	0.2	(0.2)			
Access Points and Access Roads		--	0.1	(0.1)			
Corridor Fencing and Security		0	0.1	(0.1)			
Control Systems Assets	9	1.4	2.1	(0.6)			
Safe working – Asset Protection		0.4	--	0.4	1	--	1
Safe working– Interlocking		0.1	--	0.1			
Safe working – Train Detection		--	--	--			
Safe working – Minor		--	0.3	(0.3)			
Power Resilience		0.3	0.1	0.3	1	1	--
Telecommunication Assets		0.1	--	0.1	--	--	--

Renewal Item	Note	Cost (\$m)	Budget (\$m)	Var	Scope	Budget	Var
Transmission and Data Renewal		0.4	0.5	(0.1)	5	4	1
UTC/DTC System Upgrades		0.1	0.1	0.0			
Other Control Systems Renewals		--	1.1	(1.1)	--	4	(4)
Electrical Traction Assets	10	--	--	--	--	--	--
Overhead Line Equipment		--	--	--			
Power Systems		--	--	--			
Technology	11	0.1	0.2	0.0	--	--	--
NAMS		--	0.1	(0.1)			
ATIS		--	--	--			
Movement Planner		0	0.1	(0.1)			
RSB Total		14.9	11.8	3.1			
NON – RSB Technology		0.1	-	0.1			
Non-RSB ODCN		-	-	-			
Non-RSB APS Augmentation		0.1	-	0.1			
Total		15.0	11.8	3.2			

Variation Commentary:

1. Track Renewals:

As indicated in Table 7, Aurizon Network incurred \$2.4m delivering the track renewal activities in the Moura System, compared to the approved budget of \$2.7m; a variance of -\$0.3m. The main cause of variation in this category is the planned sleeper renewal scope was not completed while costs were still incurred. This was mainly due resources which had already mobilised to complete sleeper renewal works, when the works were cancelled and deferred to FY23. The cancellation was a result of wet weather conditions preventing the works from being completed safely.

2. Turnouts:

During FY22, Aurizon Network completed three additional scope items in the Moura Turnout Renewal category and underspent on Turnout Components and Design. Aurizon Network incurred total costs of \$2.3m against a budget of \$1m; a variance of \$1.3m. The variation to the scope completed in FY22 against the planned scope of 0 turnout renewals was due to scope that was deferred from FY21 and completed during FY22. As noted in the FY21 Capital Expenditure Claim, Aurizon Network experienced supply chain delays with turnout materials not arriving in time to complete the works within the FY21 planned possessions.

3. Ballast Undercutting:

Aurizon Network completed approximately 57% of the ballast undercutting scope in the Moura system while incurring costs equating to approximately 105% of the budget. A safety audit conducted during the year identified risks associated with some of the safety equipment (masks) being used by Aurizon Network's Mechanised Production team. The results of this audit were received while crews were mobilised to complete works so costs had already been incurred. To ensure the safety of the teams involved, works were deferred to allow time to procure appropriate safety equipment which led to the impact in production in the Moura system. For ballast undercutting works, Aurizon Network's costs are materially fixed and do not vary directly in line with variances to the scope.

4. Bridge Ballast:

During FY22, Aurizon Network completed one bridge ballast renewal as per the Approved RSB. Additionally, costs were incurred and scope was completed for the bridge rollout at Callide Creek number 2 which had been

deferred from FY21. Resources were mobilised twice to complete this work but both times they were unable to complete the work due to wet weather. The additional scope and multiple mobilisations were a key driver of increase in cost above budget.

5. Structures:

During FY22, Aurizon Network completed 100% of the planned Structures Renewal scope in Moura plus additional scope which had been deferred from FY21.

- **Bridge renewals:** Aurizon Network completed unplanned minor bridge renewal works which were identified on the abutment on the bridge at Kroombit Creek. This work cost less than \$0.1m to complete and program changes were communicated through the RIG process.
- **Culvert renewals:** The culvert renewals in Moura saw an increase in scope completed and related cost primarily due to FY21 scope that was deferred to FY22. In FY21, the culvert renewal program experienced delays driven by a combination of COVID-19 impacts on the material supply-chain, and a Safety Pause (in FY21) where delays were experienced when certifying the external contractor to work unsupervised on the network.

6. Formations:

Aurizon Network experienced an increase in costs of approximately \$1.0m in relation to the Moura Formation Renewals program in FY22 primarily as a result of an increase in reactive formation renewal costs due to wet weather events in FY22.

7. Level Crossings:

100% of the planned scope for Level Crossings in the Moura System was completed under budget.

8. Corridor Assets:

There was no planned scope and no costs were incurred for Corridor Assets renewals in the Moura System.

9. Control Systems:

The variations in scope delivered compared to planned scope for the Moura Control Systems category are noted below:

- **Asset Protection:** Although no scope was planned for Moura Asset Protection in the FY22 RSB, the Graham weigher replacement was completed in FY22. This was originally planned to be completed in FY21.
- **Interlocking:** There was no planned scope for Interlocking in Moura in FY22 however costs of approximately \$0.1m were incurred, relating to the completion of FY21 scope that had been deferred.
- **Power Resilience:** During FY22, Aurizon Network completed scope that was originally deferred from FY21 due to COVID-19 supply issues relating to delivery of alternators. The planned FY22 scope has been deferred due to issues with procuring batteries.
- **Transmission and Data Renewal:** Additional scope was completed without going over budget. The additional scope was primarily FY21 scope related to antenna realignment investigation, works to improve reliability on the Tetra radio system, and renewal of the Earlsfield Microwave Room.
- **Other Control Systems:** No scope has yet been completed with costs incurred of approximately \$0.1m.

10. Electrical: N/A

11. **Technology:** Variations to the Technology category, including costs incurred as a result of projects not included in the RSB, are discussed in section 8.

6.2 Cost Incurred versus Claimed Amount

In line with Clause 1.3(a)(ii) of Schedule E of UT5, please refer to Table 8 below for details of the costs incurred for the Year versus the claimed amount for the Moura System.

Table 8 Moura System Costs Incurred versus Claimed Amount

Item	Total Costs Incurred in FY22 (\$m)	FY22 Scope Claimed in FY22 (\$m)	Prior Year Scope Claimed in FY22 (\$m)	Future Year / Multi -Year Scope Claimed in FY22 (\$m)	Total Claimed Expenditure (\$m)	IDC (\$m)	Total Claimed Amount including IDC (\$m)
Track Renewal	2.5	1.5	1.1	-	2.6	0.1	2.7
Turnouts	2.4	0.1	3.1	-	3.2	0.1	3.3
Ballast Undercutting	2.0	2.0	-	-	2.0	0.0	2.0
Bridge Ballast	0.9	0.5	0.8	-	1.4	0.1	1.4
Structures	2.0	0.7	1.6	-	2.4	0.1	2.4
Formation Renewal	3.0	2.7	0.4	-	3.2	0.0	3.2
Level Crossing Renewal	0.6	0.5	0.4	-	1.0	0.0	1.0
Corridor Assets	0.0	0.0	-	-	0.0	0.0	0.0
Control Systems Assets	1.4	0.1	2.2	-	2.3	0.1	2.4
Electrical Assets	-	-	-	-	-	-	-
Technology	0.2	0.2	0.1	-	0.3	0.0	0.3
Total	15.0	8.4	9.8	-	18.2	0.6	18.8

7. Newlands System and Goonyella Abbot Point Expansion Project (GAPE)

7.1 Cost Incurred and Scope Achieved for the Year

Please refer to Table 9 for details of the costs incurred and scope achieved within the Newlands System and GAPE. The RSB for the Newlands System and GAPE was not approved by the RIG. Aurizon Network understands that the methodology for allocating renewals costs between Newlands and GAPE Train Services was a key reason for this outcome.

In accordance with clause 7A.11.3(m)(iii) and 7A.11.3(o), Aurizon Network implemented the Interim RSB and throughout FY22, communicated scope and cost outcomes to the RIG through quarterly reports and customer forums. Aurizon Network is unaware of any objections pertaining to the implementation of the Interim RSB and considers that the expenditure specified in the Renewals Capex Claim for the Newlands System and GAPE is prudent and efficient. Aurizon Network seeks QCA approval of its Renewals Capex Claim as per clause 7A.11.6(c).

Please note that asset replacement and renewal expenditure on infrastructure constructed as part of the GAPE project is separately identified in Table 10 below.

Table 9 Combined Newlands System and GAPE Costs Incurred & Scope achieved for the Year

Renewal Item	Note	Cost (\$m)	Budget (\$m)	Var	Scope	Budget	Var
		FY	FY		FY	FY	
Track Renewals	1	9.2	7.6	1.6			
Rail Renewal		1.1	1.5	(0.4)	2	1.9	0.1
Sleeper Renewal		2.9	2.8	0.1	3.3	3.1	0.2
Track Upgrade		4.9	3.2	1.7	5.2	4.9	0.3
Permanent Way Other		0.3	0.1	0.2			
Turnouts	2	1.8	1.5	0.3			
Turnout Renewal		1.6	0.9	0.7	1	1	--
Turnout Components		0.1	0.5	(0.4)			
Turnout Design		0.1	0.1	0			
Ballast Undercutting	3	3.3	3.4	(0.1)			
Mainline Undercutting		2.6	2.8	(0.2)	5.7	6.9	(1.2)
Turnout Undercutting		0.5	0.4	0.1	3	3	--
GPR		0.2	0.2	0			
Bridge Ballast	4	0.3	0.5	(0.2)			
Bridge Rollout		0.3	0.5	(0.2)	--	1	(1)
Structures	5	3.9	4.9	(1)			
Bridges		2	3	(1)	2	2	--
Culvert Renewal		1.7	1.7	0	7	5	2
Culvert Design		0.2	0.2	0	4	1	3
Formations	6	2.1	2.1	0			
Formation Renewal		1.5	1.7	(0.2)	0.7	0.7	--
Formation Reactive		0.6	0.4	0.2			--
Level Crossing	7	0.2	0.2	(0.1)			
Level Crossing Renewal		--		--			--
Level Crossing Design		0.2	0	0.1			
Level Crossing Other		--	0.2	(0.2)			
Corridor Assets	8	0.1	0.2	(0.1)			

Renewal Item	Note	Cost (\$m)	Budget (\$m)	Var	Scope	Budget	Var
Access Points and Access Roads		0	0.1	(0.1)			
Corridor Fencing and Security		0.1	0.1	0			
Control Systems Assets	9	2.4	4.6	(2.2)			
Safe working - Asset Protection		1.1	0.9	0.2	1	2	(1)
Safe working - Interlocking		0.1		0.1			
Safe working - Train Detection		--		--			
Safe working - Minor		0	0.1	(0.1)			
Power Resilience		0.8	1.2	(0.4)	13	14	(1)
Telecommunication Assets		0		0			
Transmission and Data Renewal		0.3	0.6	(0.3)	1	4	(3)
UTC/DTC System Upgrades		0.1	0.4	(0.3)	1	2	(1)
Other Control Systems Renewals		--	1.4	(1.4)	7	9	(2)
Electrical Traction Assets	10	--	--	--			
Overhead Line Equipment				--			--
Power Systems				--			--
RSB Technology	11	0.1	0	(0.2)	--	--	--
NAMS		--	0.1	(0.1)			
ATIS		--	--	--			
Movement Planner		0.1	0.2	(0.1)			
RSB Total		23.1	25.3	(2.2)			
NON – RSB Technology		0.1		0.1			
Non-RSB ODCN		-	-	-			
Non-RSB APS Augmentation		0.1	-	0.1			
Total		23.2	25.3	(2.1)			

Variation Commentary:

1. Track Renewals:

During FY22, Aurizon Network incurred \$9.2m delivering the track renewal activities in the Newlands System and GAPE, compared to the interim budget of \$7.6m; a variance of \$1.6m. Additional scope related to planned FY22 scope items requiring longer kilometre sections to be completed in track upgrade, rail renewal and sleeper renewal. Costs were higher than planned given the cost involved in completing this additional scope along with works that will be commissioned in FY23.

2. Turnouts:

Aurizon Network incurred \$1.8m delivering turnout renewal activities in the Newlands System and GAPE, compared to the interim budget of \$1.5m; a variance of \$0.3m. Additional costs were driven by additional formation works as well as culvert strengthening works in order to maintain the integrity of the turnout. This was offset by savings in component and design activities.

3. Ballast Undercutting:

During FY22, approximately 89% of the planned Ballast Undercutting scope in Newlands and GAPE was achieved for 97% of the budgeted cost. This was primarily driven by the increase in Track Upgrade renewal works which ran longer than scheduled. This delay prevented the Ballast Undercutting machine from accessing the system for the time that it required to complete the full scope of planned works. The remaining scope will be deferred to FY23. For ballast undercutting works, Aurizon Network's costs are materially fixed and do not vary directly in line with variances to the scope.

4. Bridge Ballast:

Aurizon Network was unable to complete the planned scope for Newlands and GAPE Bridge Ballast renewal during FY22 due to a delay in the start of the planned closure during which the works were scheduled to be completed. As a result of the shortened closure period, the works were unable to be performed without impacting other planned works so they have been deferred to FY23.

5. Structures:

During FY22, Aurizon Network completed 100% of the planned Structures Renewal scope in Newlands and GAPE plus additional scope which had been deferred from FY21. Aurizon Network incurred approximately 80% of the budgeted cost. Two additional culvert renewals were completed along with three additional design activities. The design activities have been brought forward to help Aurizon more accurately assess future budget scope and cost estimates.

6. Formations:

Aurizon Network completed 100% of the planned Formations renewal scope on budget in Newlands and GAPE.

7. Level Crossings:

During FY22, there were no planned Level Crossing renewals in Newlands and GAPE. The budgeted amount for the renewal category was used to work on designs for future renewals.

8. Corridor Assets:

There was no planned scope for Corridor Assets renewals in Newlands and GAPE. Costs incurred were 50% less than budget. Budget was to develop designs for future renewals.

9. Control Systems:

The variations in scope achieved when compared to planned scope for the Control Systems category is noted below:

- **Asset Protection:** Aurizon Network completed one of the two planned scope items for Asset Protection in the Newlands Systems being the Sonoma weighbridge replacement. Additional concreting and track work was required for this replacement and resulted in costs incurred being higher than the budgeted amount. The other scope item will be deferred to FY23 as a result of securing the supplier and long lead time required for the delivery of the materials.
- **Power Resilience:** 13 power resilience renewals were completed during FY22 against a budget of 14. This category was impacted by delays in signalling battery delivery and resource availability.
- **Transmission and Renewal Data:** The power supply renewal scope that was not achieved according to the RSB had been completed in FY21. Deferred FY21 scope related to IP Network Enabling has been deferred to FY23 due to resource constraints and ongoing works on existing infrastructure to prepare for the new data network.
- **UTC/DTC System Upgrades:** The decision was made to defer the Digital Telemetry renewal at the Collinsville site in order to combine this work with the future interlocking renewal planned at the site. It is expected that by combining these renewals, efficiencies can be gained.
- **Other Control Systems:** During FY22, Aurizon Network undertook a review of the scope design, seeking to understand whether a more efficient design solution could be implemented. As a result, the decision was made to defer some scope originally included in the FY22 Interim RSB. The signalling design scope for Collinsville is due to be completed in early FY23 and once this is done, assessment can be made as to whether the McNaughton interlocking design is also required.

10. Electrical: N/A

11. Technology: Variations to the Technology category, including costs incurred as a result of projects not included in the RSB, are discussed in section 8.

7.1.1 Separately identifying asset replacement and renewal expenditure constructed at GAPE

Aurizon Network has separately identified the asset replacement and renewal expenditure associated with Rail Infrastructure that was constructed as part of the Goonyella Abbot Point Expansion Project (**GAPE**). This includes asset replacement and renewal expenditure incurred:

- between North Goonyella Junction and Newlands Mine Junction (the GAPE Link); and
- on common-user Rail Infrastructure geographically located in the Newlands system but constructed as part of the GAPE project (i.e. the Newlands System Enhancements).

A breakdown of asset replacement and renewals expenditure on GAPE Rail Infrastructure is provided below:

Table 10 FY21 Asset Replacement and Renewals Expenditure – GAPE Rail Infrastructure

Activity	Value (\$m)
Track Renewals	0.2
Turnouts	1.9
Ballast Undercutting	0.4
Bridge Rollout	0.0
Corridor Assets	0.0
Total	2.5

7.2 Cost Incurred versus Claimed Amount

In line with Clause 1.3(a)(ii) of Schedule E of UT5, please refer to Table 11 below for detail on the costs incurred for the Year versus the claimed amount for the Newlands System and GAPE.

Table 11 Combined Newlands/GAPE System Costs Incurred versus Claimed Amount

Item	Total Costs Incurred in FY22 (\$m)	FY22 Scope Claimed in FY22 (\$m)	Prior Year Scope Claimed in FY22 (\$m)	Future Year / Multi-Year Scope Claimed in FY22 (\$m)	Total Claimed Expenditure (\$m)	IDC (\$m)	Total Claimed Amount including IDC (\$m)
Track Renewal	9.1	8.6	0.1	-	8.8	0.1	8.8
Turnouts	1.7	1.7	0.4	-	2.1	0.0	2.1
Ballast Undercutting	3.2	3.2	0.0	-	3.2	0.0	3.2
Bridge Ballast	0.3	0.0	-	-	0.0	0.0	0.0
Structures	4.0	2.9	1.0	-	3.9	0.1	4.0
Formation Renewal	2.0	2.0	0.1	-	2.0	0.0	2.1
Level Crossing Renewal	0.2	-	-	-	-	-	-
Corridor Assets	0.1	0.1	0.0	-	0.1	0.0	0.1
Control Systems Assets	2.3	2.0	0.3	-	2.3	0.0	2.3
Electrical Assets	-	-	-	-	-	-	-
Technology	0.1	0.3	0.1	-	0.3	0.0	0.3
Total	23.2	20.8	1.9		22.8	0.2	23.0

8. System Wide

In addition to the ten renewal categories previously identified, the FY22 RSB also provided a budget for expenditure on Technology Projects, which includes works associated with NAMS (**OneSAP**), ATIS and Movement Planner. Capital expenditure associated with these projects has been included within this submission for approval and subsequent inclusion in the RAB. As these are system-wide renewal projects, relevant commentary is provided in **section 8.1** but is applicable to all coal systems.

Aurizon Network has also included relevant commentary in section 8.2 on Technology Projects related to APS Augmentation and Operational Data Communication Network (ODCN) enhancements. These projects were not included in the RSB but are being included with this submission for approval and subsequent inclusion in the RAB.

8.1 Technology Projects included within the FY22 RSB

8.1.1 OneSAP

As highlighted in the FY21 Capital Expenditure Claim, OneSAP aims to improve data quality by replacing a legacy manual asset management process with an interrelated system that provides a digital representation of the asset life cycle. The OneSAP project initially focussed on the key deliverable of adding functionality to the existing NAMS system. This portion of the project was completed in FY21 and the associated cost was included in the FY21 Capex Claim. Aurizon Network continues to focus on dedicated and targeted training to embed OneSAP within its business processes and promoting consistency of inputs. While the focus remains on embedding the processes, planned scope related to the OneSAP program has been deferred to future years. No costs related to OneSAP were incurred in FY22. Accordingly, this does not form part of the FY22 Capex claim project costs.

8.1.2 ATIS

Aurizon Network completed its trial of the Pantograph Detection system (PCDS) and Wire Geometry Measurement System (WGMS) in December 2021 and engaged with the RIG to present the business case for full deployment of ATIS, outlining the key project benefits and seeking endorsement of the budget required to continue the project. Support was received from the RIG in April 2022 to invest in the full deployment of ATIS for an estimated \$10.5m, including the trial costs incurred to date. During FY22, Aurizon Network incurred expenditure of \$0.7m for the ATIS trial (consistent with the Approved RSB and the Interim RSB) and \$2.7m of capital expenditure related to full deployment consistent with the project plan. The ATIS project is expected to be commissioned and substantively completed by the end of FY23. The total capital investment in ATIS will be submitted to the QCA for approval as part of the FY23 Capital Claim in line with clause 1.3(a)(ii) of Schedule E of UT5 which requires that Aurizon Network claim costs associated with assets that have been commissioned during the year.

8.1.3 Movement Planner

Movement Planner is a software tool used within Network Train Control to provide a real-time train monitoring solution for the Day of Operations activities. The QCA approved the capital expenditure associated with Movement Planner as part of the FY16 and FY17 capital expenditure claims and it has been included in the RAB.

The original software (v0.5) was implemented in 2016 and is no longer supported by the vendor. In FY22, v0.5 was superseded by Movement Planner v1.5. The FY22 Approved RSB and Interim RSB provided for expenditure associated with the upgrade to Movement Planner v1.5, the scope of which included the upgrade of current hardware and software levels from end-of-life products to vendor supported versions of the products, and development of the specific technical integrations required between existing systems and Movement Planner to meet business requirements. Following engagement with the Movement Planner software supplier, Aurizon Network refined the technical specifications of the required enhancement and agreed on final specifications that involved minimal customisation.

The Approved RSB and Interim RSB provided a total budget of \$4.3m across all systems for the costs of the upgrade from Movement Planner v0.5 to Movement Planner v1.5. Aurizon Network was able to achieve significant savings by not implementing customisations to the software which led to reduced costs related to internal labour, external consultants, infrastructure build, software licences and testing costs. This has resulted in total FY22 upgrade costs incurred across all Coal Systems of \$1.6m against a budget of \$4.3m (a reduction of \$2.7m from budget).

In addition to the \$1.6m incurred in FY22, Aurizon Network is seeking QCA approval of a further \$3.7m incurred in FY18 relating to Movement Planner support costs that would enable the technical integration between Movement Planner and the Advanced Planning and Scheduling (**APS**) system. As noted in Aurizon Network's FY21 APS capital expenditure claim, the \$3.7m in Movement Planner support costs were transferred from the project to be managed on a standalone basis. For clarity, Aurizon Network did not seek QCA approval of these amounts in FY21.

In accordance with Clause 2 of Schedule E to UT5, Aurizon Network is therefore seeking QCA approval to include total Movement Planner costs of \$5.3m into the RAB.

8.2 Technology Projects not included in the FY22 RSB

As part of this FY22 capital expenditure claim, Aurizon Network is seeking QCA approval to include capital expenditure of \$4.9m (excluding IDC) into the RAB which relates to the following key improvement initiatives:

8.2.1 Advanced Planning and Scheduling Augmentation Project

Advanced Planning and Scheduling (**APS**) is an asset renewal project that has replaced Aurizon Network's legacy planning and scheduling systems and manual processes with a modern, integrated planning and scheduling platform. The QCA approved the capital expenditure associated with APS for inclusion into the RAB as part of the FY21 capital expenditure claim.

As outlined in the FY21 APS capital expenditure claim, APS is used throughout each stage of Aurizon Network's planning and scheduling processes, enabling the development of robust train schedules for execution. APS has helped to facilitate higher quality planning outcomes by improving both planning and scheduling accuracy. While APS improved access to, and visibility of, consistent and timely information across planning and scheduling processes, it did not provide Aurizon Network with the ability to modify and/or manage the running and operation of live trains within the system.

In FY22, Aurizon Network delivered the APS Augmentation project for a cost of \$2.2m. The APS Augmentation project delivered variations to the APS licensing structure, which have now enabled additional functionality within APS to modify and/or manage the running and operation of live trains in the day of operation. This enables Aurizon Network to better facilitate forward planning within the day of operations and additionally, provide information into the scheduling time horizon for the development of the next Daily Train Plan (DTP). This in turn leads to a more stable train schedule that is less likely to require a large number of changes.

Aurizon Network will use information gathered from the day of operations functionality to provide more accurate data inputs for managing current and future traffic management tasks. This information enables Aurizon Network's Control team to monitor traffic on the network with much more accuracy. This in turn allows the team to use that information to plan for future events that may occur such as conflicts with other trains or maintenance tasks that need addressing. APS is the most accurate source of train ETA/ETD information in Aurizon Network's suite of scheduling and execution applications.

Aurizon Network notes that as a result of the APS Augmentation project, Aurizon Network is able to share this information directly with supply chain participants (either via PowerBI or through a direct interface with customer systems) to support improved outcomes in the Day of Operation for the CQCN Supply Chain.

8.2.2 Operational Data Communications Network enhancements

The Operational Data Communications Network (ODCN) consists of telecommunications infrastructure and data communication elements which support an array of services including train control systems, signalling telemetry, wayside equipment, train radio communications, power supervisory systems and network monitoring tools.

As part of Aurizon Network's broader Control Systems Renewals programme, legacy Voice Frequency (VF) systems are being replaced with equipment requiring Internet Protocol (IP) networking. The ODCN enhancements are required to support the new IP networks and are intended to standardise and simplify the data network by reducing the requirement for multiple IP devices at the same site, which also enables easier configuration and supports more secure access to the operational network for a range of asset classes.

Aurizon Network initially contemplated the gradual completion of the ODCN enhancements over a period of 5 to 7 years (between FY19 and FY25). With the growth of data requirements and move towards automated asset monitoring, the scope of the ODCN enhancement project would see works completed at 98 sites, including a combination of renewals and new infrastructure. Works at 54 of these sites would involve the reconfiguration of the existing data network infrastructure to improve availability and security. The remaining 44 sites had no prior network capability and required the installation of additional data network devices. Aurizon Network delivered these sites through an accelerated capital renewal program during FY18, FY19 and FY20 to support the provision of services such as digital telemetry and provision of internet connectivity at corridor equipment rooms.

The ODCN enhancements improve services delivered over the data network infrastructure. In light of the fact that this programme accelerated the renewal of assets at some locations, the decision was made to claim this expenditure at the time where either:

- the assets would have been due for replacement had they not been a part of the accelerated renewal program; or
- when the assets upgrade provided benefit to the entire network.

During FY22, it was noted that the asset upgrades were now providing benefit to the entire network. This is due to the renewals of the ODCN and updated communications systems being in line with the new data network management principles which enable Aurizon Network to better manage service provision and cyber security. The benefit is to the entire network through improved resiliency. As a result, Aurizon Network is seeking QCA approval of the ODCN project costs as part of the FY22 Capex Claim. These costs are presented in Table 12 below.

8.3 Cost Incurred versus Claimed Amount

In line with Clause 1.3(a)(ii) of Schedule E of UT5, please refer to Table 12 below for details of the costs incurred for the Year versus the claimed amount for the Technology projects not included in the FY22 Approved RSB and Interim RSB. These values have been accounted for in the individual system tables for consistency, however the total amount attributable to these projects has been presented here separately for clarity. Please note the amounts presented in Table 12 are not in addition to what has already been presented.

Table 12 Other Improvement Initiative (Non-RSB) Costs Incurred versus Claimed Amount

Item	Claimed Expenditure (\$m)	IDC (\$m)	Total Claimed Amount including IDC (\$m)
APS Augmentation	2.2	0.0	2.2
ODCN Renewal	2.7	0.2	2.9
Total	4.9	0.2	5.1

9. Procurement Strategy and Inventory

In completing asset replacement and renewals work for FY22, Aurizon Network has endeavoured to procure resources in an effective and efficient manner, an outcome that was supported through the execution of the procurement strategy and methodology outlined within the Approved RSB and Interim RSB for FY22. This approach saw Aurizon Network seek to maximise utilisation of its internal delivery teams and augment these internal resources with suitably qualified contractor staff and plant where additional resources were required to complete identified scope.

When engaging external resources, Aurizon Network utilised, wherever reasonably possible, a series of engineering and technical service contractor panels, established through its Enterprise Procurement group. These include asset-specific service panels, skilled labour hire, plant hire and plant transportation services. Where scope required a specific skill set or if the required plant was not held within the Aurizon Network group, Aurizon Network sought to engage pre-qualified contractors to perform work either under direct supervision or if approved, as principal contractor for short periods. Aurizon Network applies an assurance program and a performance-based governance framework for external contractors to ensure they meet the required business and safety processes and policies.

As detailed in the commentary within this submission, COVID-19 continues to have an impact on some items within the FY22 asset replacement and renewal program. Where appropriate, Aurizon Network has sought to manage the ongoing impact and challenges associated with COVID-19 (e.g. supply constraints or longer than usual lead-times) by increasing timeframes, bringing forward orders, or placing additional orders of items.

Aurizon Network will continue to work with our Customers and internal teams across the Aurizon business to assess our existing procurement practices with a view to identifying improvement opportunities that will deliver value to our business and to our Customers.

10. Capital Expenditure for inclusion into the RAB by System

This submission provides the QCA with the details of capital expenditure that Aurizon Network considers should be included in the RAB in accordance with Clause 2.2 of Schedule E of UT5. Details for each Coal System are contained within the following tables:

10.1 Blackwater System

Table 13 Blackwater System - Claimed Expenditure including IDC (\$m)

Project Number	Project Name	RIG Category	Claimed Expenditure (\$m)
IV.00447	Structures Renewal Package 2	Structures	0.4
IV.00448	Structures Renewal Package 3	Structures	4.5
IV.00451	Bridge Ballast Renewal Package 3	Bridge Ballast	0.0
IV.00454	Formation Renewal Package 3	Formation	0.4
IV.00455	Control Systems Renewal Package 1	Control Systems	0.8
IV.00456	Control Systems Renewal Package 2	Control Systems	1.5
IV.00457	Control Systems Renewal Package 3	Control Systems	1.9
IV.00460	Level Crossing Renewal Package 3	Level Crossings	0.3
IV.00462	Turnout Renewal Package 2	Turnouts	0.1
IV.00463	Turnout Renewal Package 3	Turnouts	0.8
IV.00466	Access Points Package 3	Corridor Assets	0.3
IV.00468	Access Roads Package 2	Corridor Assets	0.0
IV.00469	Access Roads Package 3	Corridor Assets	0.1
IV.00472	Corridor Security Package 3	Corridor Assets	0.0
IV.00478	Track Renewal Package 3	Track Upgrade	0.6
IV.00505	Power Systems Renewal Package 2	Electrical	1.9
IV.00508	Electrical Overhead Renewal Package 3	Electrical	0.1
IV.00644	FY21 Ballast Renewal Programme	Ballast Undercutting	0.1
IV.00678	Optical Fibre Renewal	Control Systems	0.3
IV.00692	Train Detection Renewal Central Line	Control Systems	7.0
IV.00693	Interlocking Renewal – NCL	Control Systems	3.0
IV.00694	Control System Renewal Callemondah	Control Systems	1.3
IV.00801	FY22 Track Renewal	Track Upgrade	23.5
IV.00804	FY22 Bridge Ballast Renewal	Bridge Ballast	3.8
IV.00807	FY22 Formation Renewal	Formation	3.5
IV.00810	FY22 Level Crossing Renewal	Level Crossing	2.4
IV.00813	FY22 Turnout Renewal	Turnouts	3.0
IV.00816	FY22 Culvert Renewal	Structures	7.1
IV.00820	FY22 Control Systems Renewal	Control Systems	4.0

Project Number	Project Name	RIG Category	Claimed Expenditure (\$m)
IV.00823	FY22 Power Systems Renewal	Electrical	1.5
IV.00826	FY22 Electrical Overhead Renewal	Electrical	0.5
IV.00831	FY22 Ballast Renewal	Ballast Undercutting	33.6
IV.00834	FY22 Civil Renewals	Corridor Assets	0.2
IV.00877	Handrail Install – Fairhill & Rangal	Corridor Assets	0.2
IV.00902	Movement Planner Upgrade v1.5	Technology	2.4
RSB Project Totals			111.1
IV.00631	ODCN Enhancement	Non-RSB approved project	0.5
IV.00880	APS Augmentation	Non-RSB approved project	1.0
System Total			112.6

10.2 Goonyella System

Table 14 Goonyella System - Claimed Expenditure including IDC (\$m)

Project Number	Project Name	RIG Category	Claimed Expenditure (\$m)
IV.00447	Structures Renewal Package 2	Structures	0.1
IV.00448	Structures Renewal Package 3	Structures	1.0
IV.00451	Bridge Ballast Renewal Package 3	Bridge Ballast	0.1
IV.00454	Formation Renewal Package 3	Formations	0.2
IV.00456	Control Systems Renewal Package 2	Control Systems	1.3
IV.00457	Control Systems Renewal Package 3	Control Systems	3.4
IV.00460	Level Crossing Renewal Package 3	Level Crossings	0.1
IV.00462	Turnout Renewal Package 2	Turnouts	0.1
IV.00463	Turnout Renewal Package 3	Turnouts	3.1
IV.00468	Access Roads Package 2	Corridor Assets	0.0
IV.00469	Access Roads Package 3	Corridor Assets	0.0
IV.00478	Track Renewal Package 3	Track Upgrade	1.6
IV.00504	Power Systems Renewal Package 2	Electrical	0.0
IV.00505	Power Systems Renewal Package 3	Electrical	1.6
IV.00508	Electrical Overhead Renewal Package 3	Electrical	2.5
IV.00644	FY21 Ballast Renewal Programme	Ballast Undercutting	0.9
IV.00678	Optical Fibre Renewal	Control Systems	0.2
IV.00801	FY22 Track Renewal	Track Upgrade	27.1
IV.00804	FY22 Bridge Ballast Renewal	Bridge Ballast	1.6
IV.00807	FY22 Formation Renewal	Formation	4.7
IV.00810	FY22 Level Crossing Renewal	Level Crossing	2.8
IV.00813	FY22 Turnout Renewal	Turnouts	1.8
IV.00816	FY22 Culvert Renewal	Structures	0.8
IV.00820	FY22 Control Systems Renewal	Control Systems	2.5
IV.00823	FY22 Power Systems Renewal	Electrical	1.4
IV.00826	FY22 Electrical Overhead Renewal	Electrical	0.4
IV.00829	Goonyella Ports Overhead Renewals	Electrical	0.5
IV.00831	FY22 Ballast Renewal	Ballast Undercutting	32.4
IV.00834	FY22 Civil Renewals	Corridor Assets	0.4
IV.00902	Movement Planner Upgrade v.5	Technology	2.6
RSB Project Totals			95.3
IV.00631	ODCN Enhancement	Non-RSB approved project	2.4
IV.00880	APS Augmentation	Non-RSB approved project	1.0
System Total			98.8

10.3 Moura System

Table 15 Moura System - Claimed Expenditure including IDC (\$m)

Project Number	Project Name	RIG Category	Claimed Expenditure (\$m)
IV.00447	Structures Renewal Package 2	Structures	0.0
IV.00448	Structures Renewal Package 3	Structures	1.7
IV.00451	Bridge Ballast Renewal Package 3	Bridge Ballast	0.9
IV.00454	Formation Renewal Package 3	Formations	0.4
IV.00455	Control Systems Renewal Package 1	Control Systems	0.0
IV.00456	Control Systems Renewal Package 2	Control Systems	0.6
IV.00457	Control Systems Renewal Package 3	Control Systems	1.7
IV.00460	Level Crossing Renewal Package 3	Level Crossing	0.5
IV.00462	Turnout Renewal Package 2	Turnouts	0.0
IV.00463	Turnout Renewal Package 3	Turnouts	3.2
IV.00478	Track Renewal Package 3	Track Upgrade	1.2
IV.00801	FY22 Track Renewal	Track Upgrade	1.5
IV.00804	FY22 Bridge Ballast Renewal	Bridge Ballast	0.5
IV.00807	FY22 Formation Renewal	Formation	2.8
IV.00810	FY22 Level Crossing Renewal	Level Crossing	0.5
IV.00813	FY22 Turnout Renewal	Turnouts	0.1
IV.00816	FY22 Culvert Renewal	Structures	0.7
IV.00819	Bridge Renewal	Structures	0.0
IV.00820	FY22 Control Systems Renewal	Control Systems	0.1
IV.00831	FY22 Ballast Renewal	Ballast Undercutting	2.0
IV.00834	FY22 Civil Renewals	Corridor Assets	0.0
IV.00902	Movement Planner Upgrade v1.5	Technology	0.2
RSB Project Totals			18.7
IV.00880	APS Augmentation	Non-RSB approved project	0.1
System Total			18.8

10.4 Newlands System and GAPE

Table 16 Newlands System and GAPE - Claimed Expenditure including IDC (\$m)

Project Number	Project Name	RIG Category	Claimed Expenditure (\$m)
IV.00447	Structures Renewal Package 2	Structures	0.2
IV.00448	Structures Renewal Package 3	Structures	0.9
IV.00451	Bridge Ballast Renewal Package 3	Bridge Ballast	0.0
IV.00454	Formation Renewal Package 3	Formations	0.1
IV.00455	Control Systems Renewal Package 1	Control Systems	0.0
IV.00456	Control Systems Renewal Package 2	Control Systems	0.2
IV.00457	Control Systems Renewal Package 3	Control Systems	0.6
IV.00463	Turnout Renewal Package 3	Turnouts	0.4
IV.00469	Access Roads Package 3	Corridor Assets	0.0
IV.00478	Track Renewal Package 3	Track Upgrade	0.1
IV.00644	FY21 Ballast Renewal Programme	Ballast Undercutting	0.0
IV.00801	FY22 Track Renewal	Track Upgrade	8.7
IV.00807	FY22 Formation Renewal	Formation	2.0
IV.00813	FY22 Turnout Renewal	Turnouts	1.7
IV.00816	FY22 Culvert Renewal	Structures	0.9
IV.00819	Bridge Renewal	Structures	2.0
IV.00820	FY22 Control Systems Renewal	Control Systems	2.0
IV.00831	FY22 Ballast Renewal	Ballast Undercutting	3.2
IV.00834	FY22 Civil Renewals	Corridor Assets	0.1
IV.00902	Movement Planner Upgrade v1.5	Technology	0.3
RSB Approved Project Totals			23.4
IV.00880	APS Augmentation	Non-RSB approved project	0.1
System Total			23.4

Appendix A: Incurred Renewal Expenditure vs Commissioned Asset System Graphs

Aurizon Network has included the following waterfall graphs to assist with the comparison of actual incurred Asset Renewals Expenditure to the value of commissioned assets for each program that is included within this submission.

Please note that the following graphs reflect the expenditure that Aurizon Network has incurred while delivering the FY22 Asset Replacement and Renewals program. While incurred expenditure provides an appropriate comparison against the Approved RSB, or Interim RSB where applicable, in some circumstances this may differ from the amounts Aurizon Network is seeking QCA approval of through this Capex Claim (which reflects commissioned assets). Aurizon Network has sought to separately identify incurred versus claimed costs for comparison. Please note that variances between incurred and claimed expenditure can exist where incurred expenditure is awaiting an administrative process (e.g. receipt of a final invoice) before the asset in question can be commissioned and subsequently transferred to Aurizon Network's Fixed Asset Register (**FAR**).

The waterfall graphs illustrate for each coal system identified in the RSB, the following:

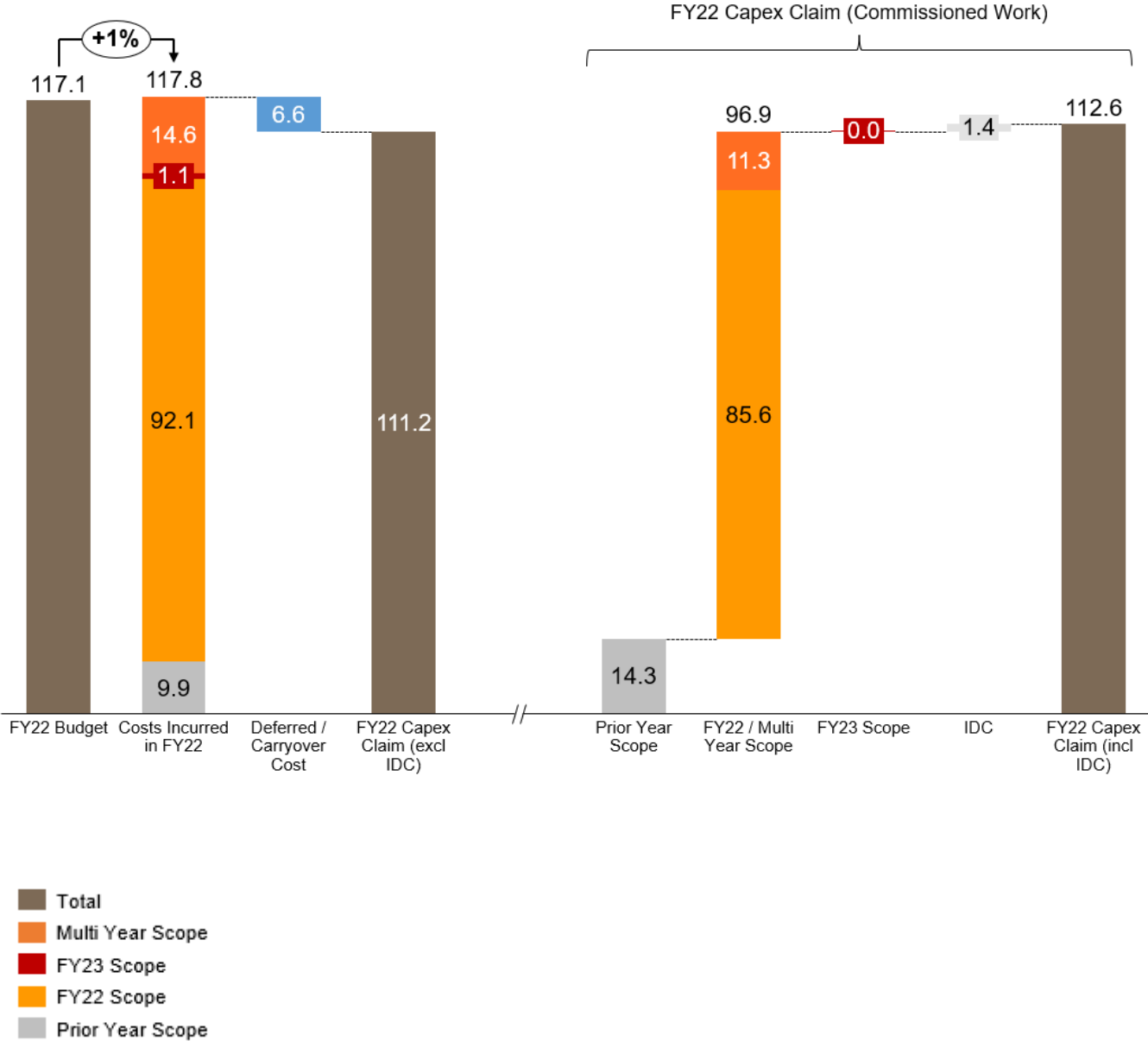
- FY22 RSB Budget
- Costs Incurred FY22 Scope, FY21 Scope, Multi Year Project Scope, FY23 Scope
- Deferred/Carry Over Costs
- FY22/Multi Year Project Capex (Claimed) \$m
- FY21 Carryover (Claimed) \$m
- FY23 (Claimed) \$m
- IDC \$m
- FY22 Capex (Commissioned Asset) \$m

Further waterfall graphs illustrating the above for each renewal category within each system are available upon request.

Blackwater

Figure 2 FY22– Blackwater System

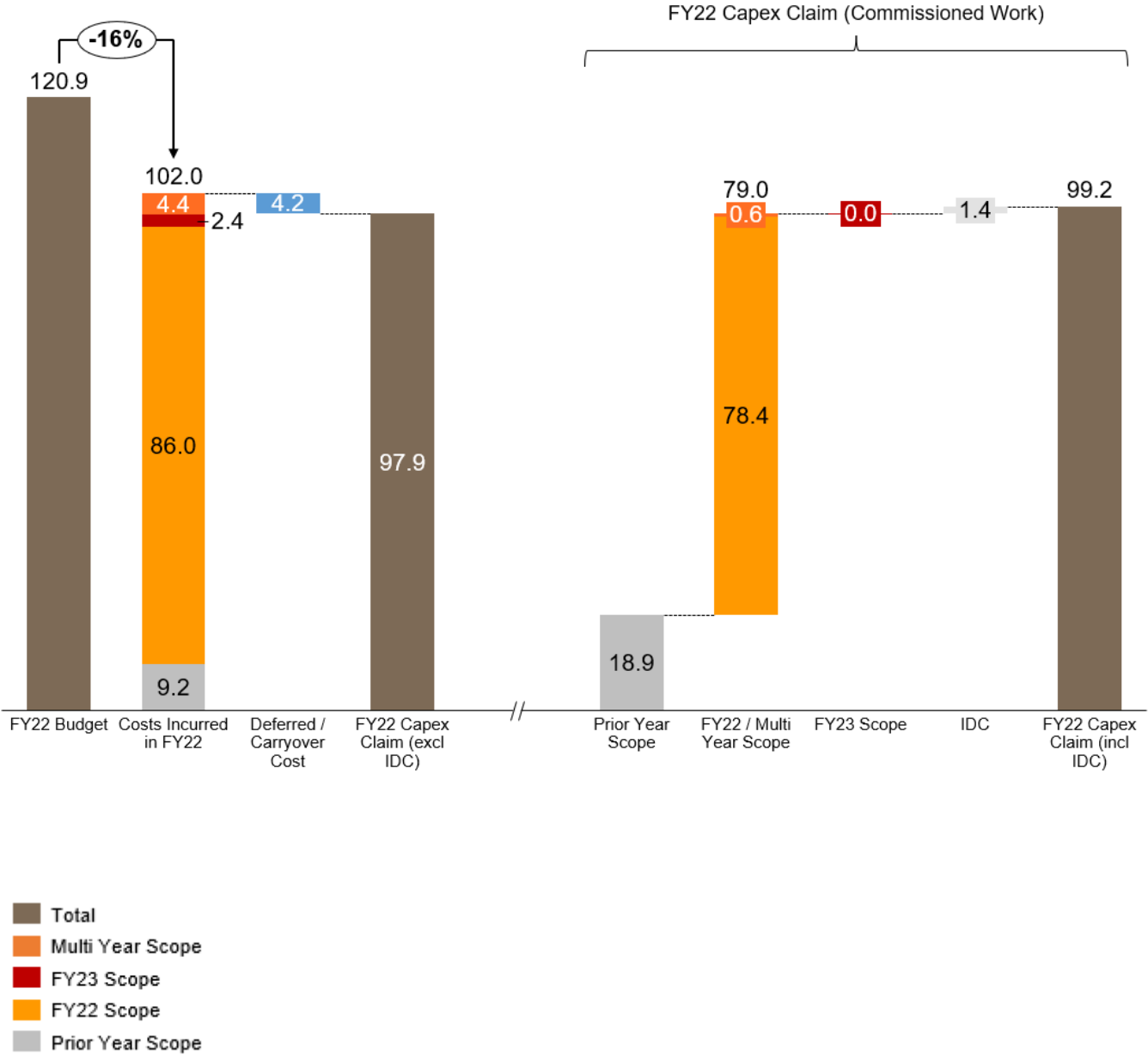
Blackwater - System Total



Goonyella

Figure 3 FY22 System - Goonyella

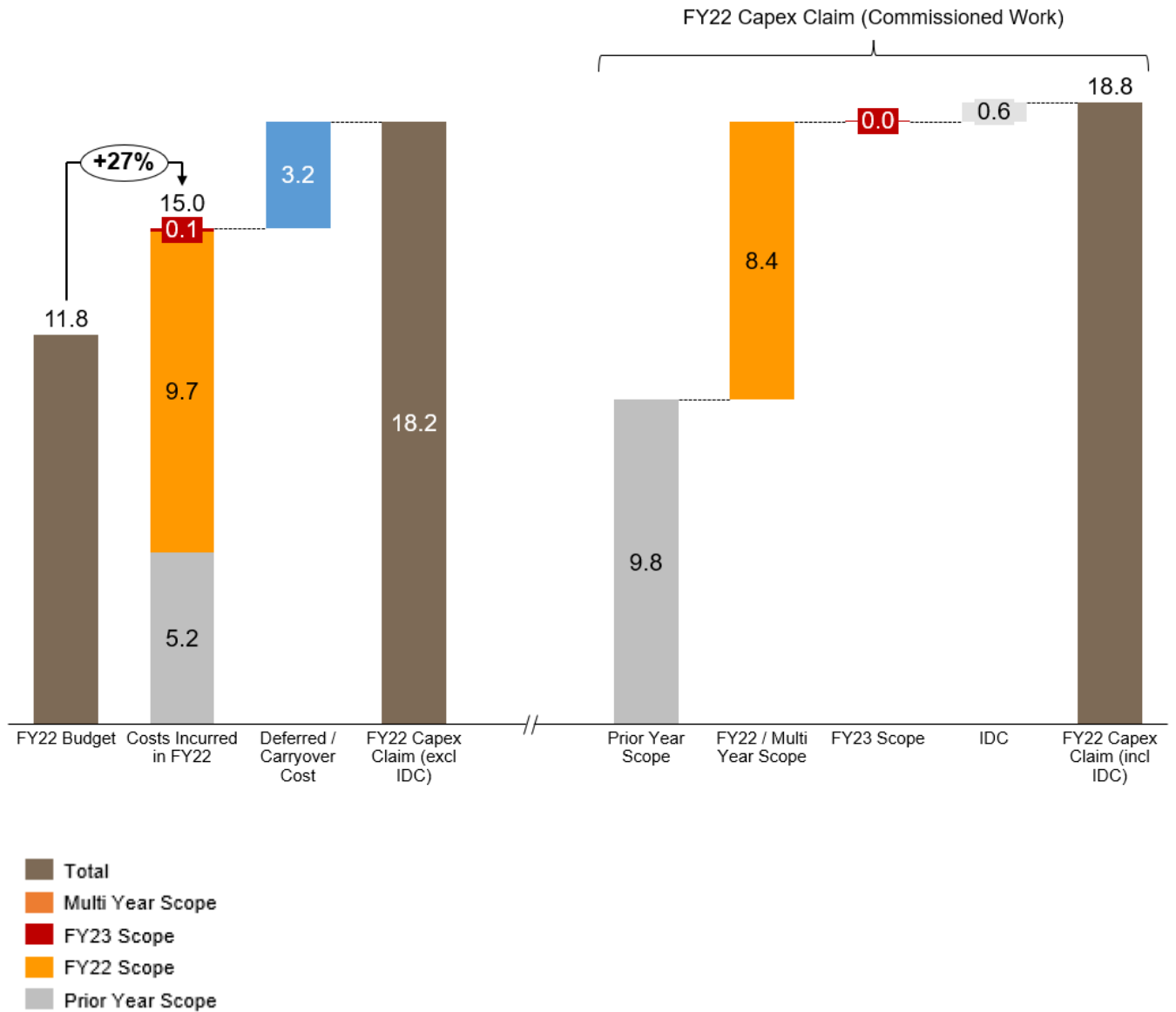
Goonyella - System Total



Moura

Figure 4 FY22 System - Moura

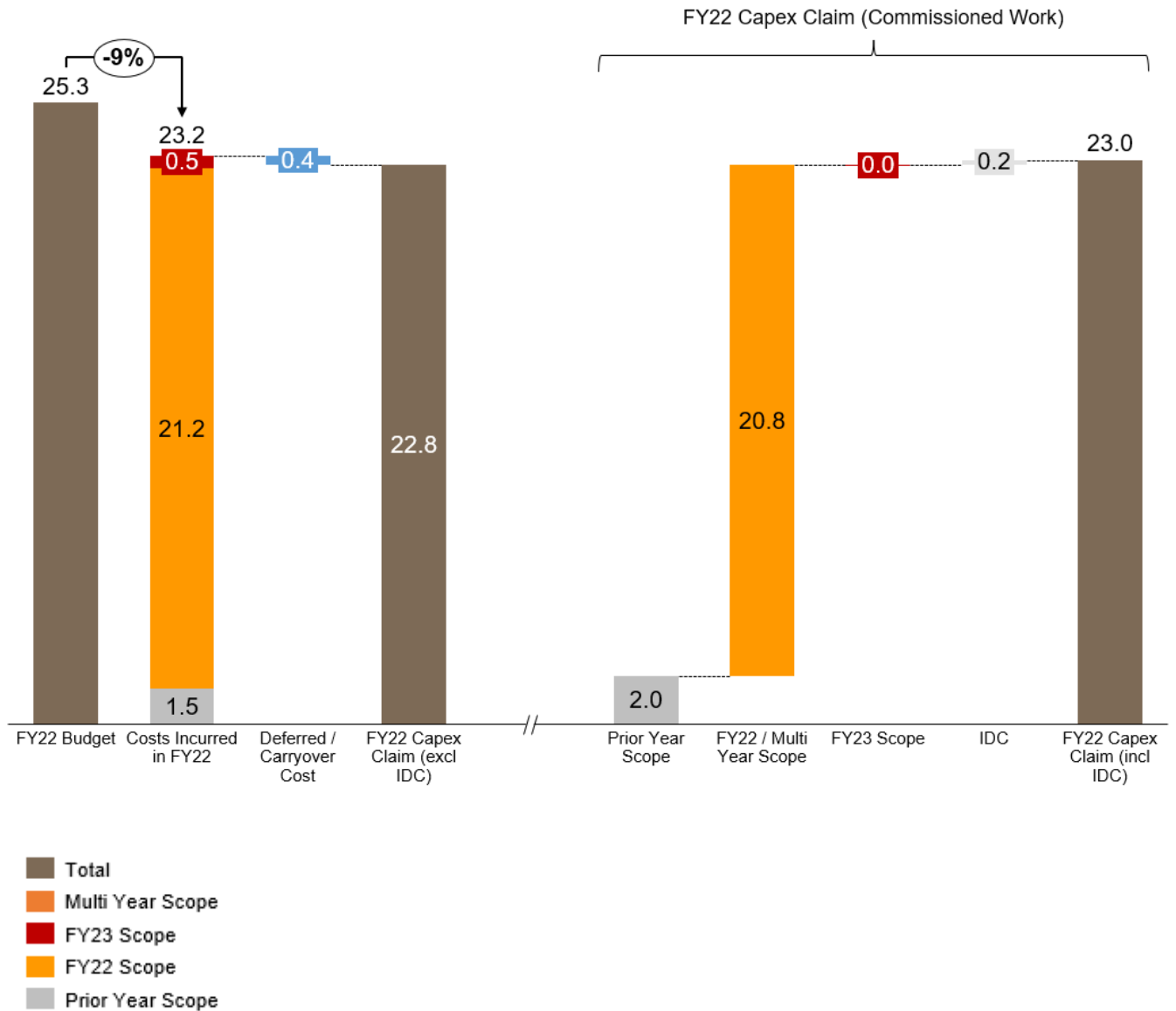
Moura System Total



Newlands and GAPE

Figure 5 FY22 System – Newlands and GAPE

Newlands System and GAPE Total



Appendix B: Supporting Documentation

Additional supporting documentation for the FY2022 Capital Expenditure Claim will be provided separately to the QCA.