2024

ANNUAL CAPACITY ASSESSMENT REPORT

COAL NETWORK CAPACITY CO.

REDACTED VERSION

Prepared By:

COAL NETWORK CAPACITY CO

Independent Expert

07 3518 5333 coalnetwork.com.au info@coalnetwork.com.au

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Contents

1. Preamble

UT5, as approved by the Queensland Competition Authority ("QCA"), requires Capacity Assessments to be performed by the Independent Expert ("IE") for of each of the Central Queensland Coal Network's coal systems, as detailed in *Part 7A: Capacity*.

This is the third Annual Capacity Assessment Report ("ACAR") since the completion of the Initial Capacity Assessment Report ("ICAR") in 2021. The ACAR determines the Deliverable Network Capacity ("DNC") for each coal system of the CQCN. The timing for the release of the ACAR has been set to align with the beginning of the next financial year.

This document should be read in conjunction with the 2024 System Operating Parameters ("SOP") which set out the assumptions on the operation of each element of the coal Supply Chain.

1.1 Deliverable Network Capacity

The following extract defining Deliverable Network Capacity is taken from Part 7A.2 of UT5. This definition is important for stakeholders to consider and understand, as it directs the Independent Experts consideration of capacity in a particular way. This requirement drives an assessment of capacity in the CQCN's rail systems that is likely to differ from other estimates of capacity undertaken for other purposes. In particular, the Independent Expert understands that the intention of the UT5 definition is primarily to ensure that capacity is assessed in a practical "deliverable" sense, rather than a more theoretical view of capacity, and this is the underlying basis of the Independent Expert's interpretation of DNC.

7A.2 Definition of Deliverable Network Capacity

(a) For the purpose of this Part 7A, Deliverable Network Capacity means the capacity of the rail infrastructure, expressed as the maximum number of Train Paths (calculated on a Monthly and annual basis) that can be utilised in each coal system (such Train Paths needing to be useable including in respect of return journeys), and the mainline and each branch line of that coal system, taking into account the operation of that coal system, having regard to:

- *(i) the way in which the relevant coal system operates in practice, including those matters taken into consideration in formulating the System Operating Parameters;*
- *(ii) reasonable requirements in respect of planned maintenance and a reasonable estimate of unplanned maintenance, repair, renewal and Expansion activities on the rail infrastructure;*
- *(iii) reasonably foreseeable delays or failures of Rollingstock occurring in the relevant Supply Chain, both planned delays and failures and a reasonable estimate of unplanned delays and failures;*
- *(iv) reasonably foreseeable delays associated with any restrictions (including speed restrictions, dwell times within Train Services and between Train Services and other operating restrictions) affecting the rail infrastructure;*
- *(v) the context in which the rail infrastructure interfaces with other facilities forming part of, or affecting, the relevant Supply Chain (including loading facilities, load out facilities and coal export terminal facilities);*
- *(vi) the need for Aurizon Network to comply with its obligations to provide access to non-coal traffic under Access Agreements, Passenger Priority Obligation or Preserved Train Path Obligations;*
- *(vii) the Supply Chain operating mode (including at the loading facilities, load out facilities and coal export terminal facilities);*
- *(viii) interfaces between the different coal systems; and*
- *(ix) the terms of Access Agreements (including the number of Train Service Entitlements for each origin and destination combination in that coal system) relating to Train Services operating in coal system.*

1.2 Annual Capacity Assessment

1.2.1 Capacity Assessment Requirements

UT5 outlines the requirements that the IE must consider in undertaking the Annual Capacity Assessment, which includes:

- Consider whether any variation of the SOP is required, provided that any amendments to the SOP:
    - include a consideration of the factors set out in the definition of Deliverable Network Capacity;
    - would be consistent with the applicable approved Maintenance Renewals and Strategy Budget; and
    - would not place Aurizon Network in breach of its obligations under UT5 or any Access Agreement.
- Seek to consult with and receive submissions from Aurizon Network and industry stakeholders on the proposed SOP.
- Set out the SOP for each coal system having regard to the way in which each coal system operates in practice.

The ACAR, and associated SOP, prepared by the IE, must report on the DNC of each coal system over the capacity assessment period. The ACAR must include information regarding:

- Assumptions that the IE has made in interpreting the definitional factors that DNC is characterised by;
- Assumptions that the IE has made in developing the SOP and other modelling related assumptions for each coal system;
- The DNC of each coal system's mainline and branch lines; and
- Constraints that reduce, or are likely to reduce, DNC of each coal system.

The outcomes of the IE's assessment must be reported to the QCA and Aurizon Network ("AN") in a redacted and unredacted form and to the Chair of the Rail Industry Group ("RIG") in a redacted form. QCA and AN will publish the redacted versions on their respective websites.

1.2.2 Capacity Assessment Period

The capacity assessment period for the ACAR24 has been determined as the five financial years FY25 to FY29 inclusive i.e. 1 July 2024 to the 30 June 2029.

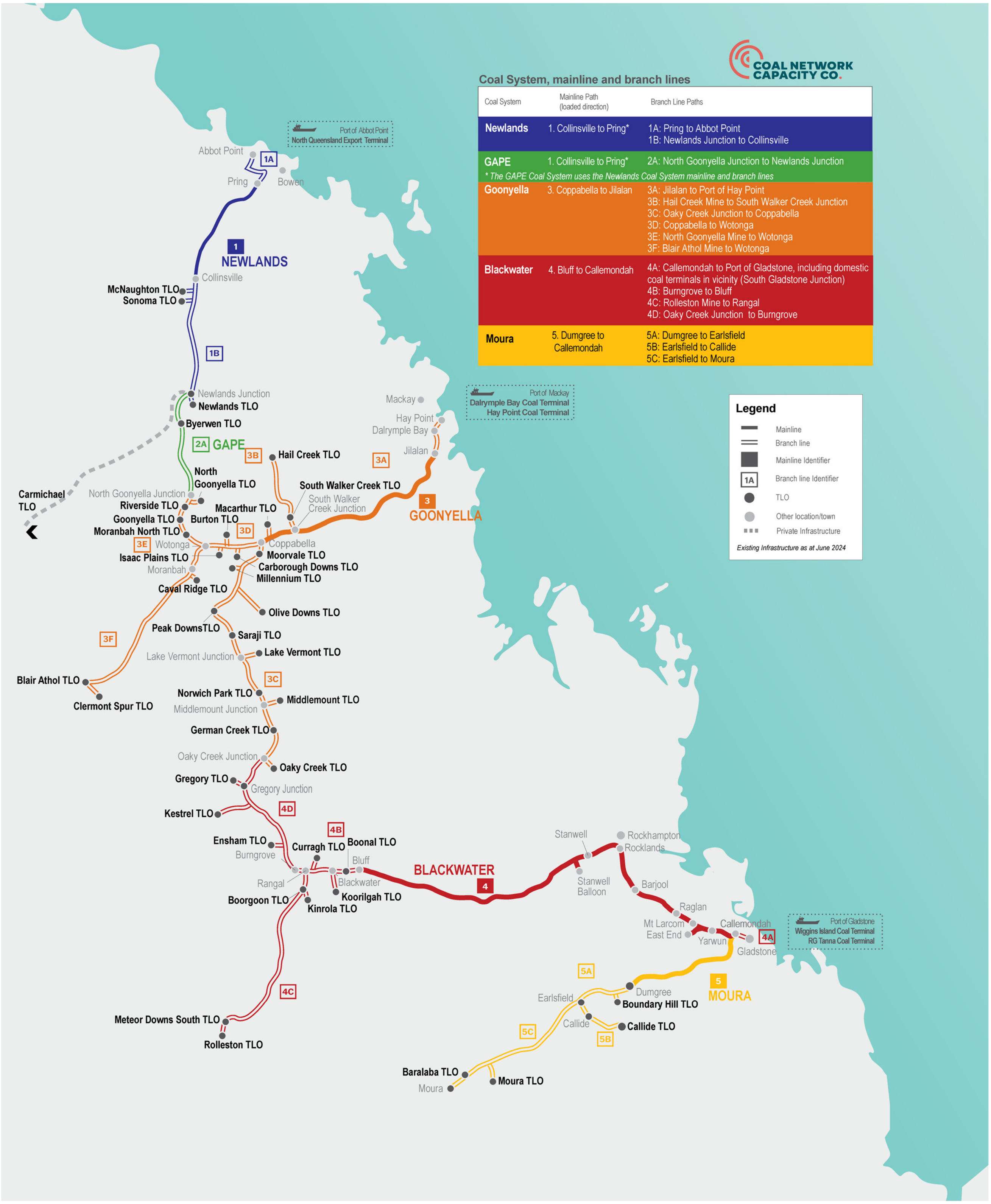
1.3 Dynamic Simulation Model (the "Model")

1.3.1 Model Scope

CNCC and the IE determines the DNC of the Central Queensland Coal Network ("CQCN") for each coal system primarily through the use of a dynamic simulation model. The Model used by CNCC is based on AnyLogic modelling software which is used to model a specific scope within the central Queensland coal industry.

A map of the CQCN is provided in
Figure 1 below.

Figure 1 - CQCN Mainline and Branch lines

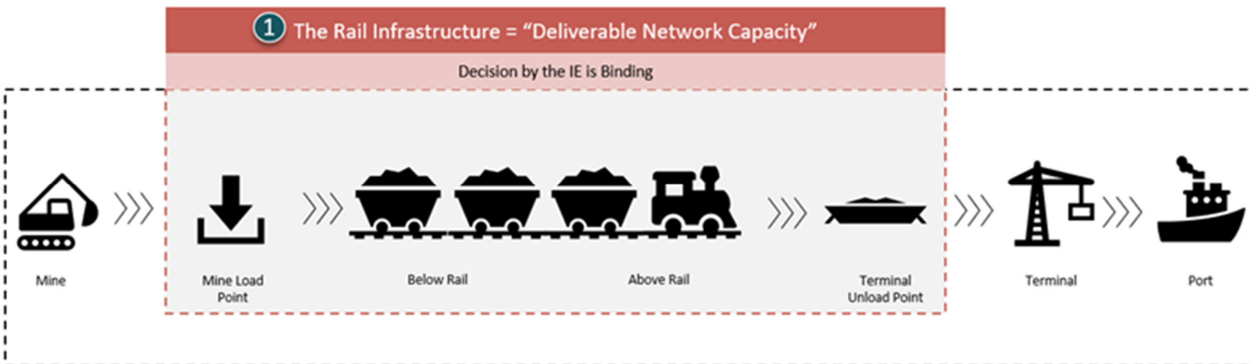


Coal System	Mainline Path (loaded direction)	Branch Line Paths
Newlands	1. Collinsville to Pring*	1A: Pring to Abbot Point 1B: Newlands Junction to Collinsville
GAPE	1. Collinsville to Pring*	2A: North Goonyella Junction to Newlands Junction
* The GAPE Coal System uses the Newlands Coal System mainline and branch lines		
Goonyella	3. Coppabella to Jilalan	3A: Jilalan to Port of Hay Point 3B: Hail Creek Mine to South Walker Creek Junction 3C: Oaky Creek Junction to Coppabella 3D: Coppabella to Wotonga 3E: North Goonyella Mine to Wotonga 3F: Blair Athol Mine to Wotonga
Blackwater	4. Bluff to Callemondah	4A: Callemondah to Port of Gladstone, including domestic coal terminals in vicinity (South Gladstone Junction) 4B: Burngrove to Bluff 4C: Rolleston Mine to Rangal 4D: Oaky Creek Junction to Burngrove
Moura	5. Dumgree to Callemondah	5A: Dumgree to Earlsfield 5B: Earlsfield to Callide 5C: Earlsfield to Moura

The scope of the Model reflects the DNC definition (**Section 1.1**) and considers activities at and between the boundaries of:

- Coal flow into wagons at Train Loadouts ("TLO"); and
- Coal flow out of wagons at inloaders/rail receival stations; and includes the components as outlined in **Figure 2.**

Figure 2 - Deliverable Network Capacity Boundaries



This model scope, consistent with the UT5 definition of DNC, means that the Model does not determine the capacity of the entire system or coal chain. In particular, the Model does not consider elements of the terminal operations beyond the inloaders and does not consider the shipping queue or terminal operations in the generation of rail demand within the Model.

1.3.2 Model Assumptions

There are several general assumptions used in the determination of the DNC:

- The IE has had to exercise judgement on a large range of issues in developing the SOP assumptions and application of these within the Model. These are called out as appropriate in each section of the SOP;
- In general, inputs into the model, including key data statistical distributions, are informed by historical data. The IE has considered data from January 2020 to December 2023 (where available), however the exact approach varies across the various model parameters;
- ACAR24 includes no additional Transitional Arrangements ("TAs") beyond those included in ACAR23, given that no further TAs have been approved for implementation (noting that RCS signalling was included in ACAR23 for the FY25 year).

1.4 Interpretation

1.4.1 Model Variability

The Model used to model the CQCN is a stochastic model and includes a mixture of fixed inputs (e.g. planned maintenance events) and random probability distributions (e.g. unplanned maintenance events) such that there is no single definitive "answer" to the resulting capacity outcome.

This means that each run of the simulation will result in different outcomes as the values for key inputs are randomly chosen throughout the course of the simulation run. Therefore, the Model is run many times to obtain a range of likely outcomes. The aim is for 50 successful seed runs.

The DNC is determined as the median result of all the simulation runs, with the 10th percentile (“P10”) and the 90th percentile (“P90”) providing an estimate of the variability within the runs. For ACAR24, the variability of each system is provided in each system’s report section.

1.4.2 Payload

UT5 requires that the capacity of the CQCN be measured in terms of train paths (a return train journey). CNCC has in addition, calculated the capacity of each system in tonnage terms, by combining the median train path capacity of each system by the median payload of trains in that system.

1.4.3 Considerations when Evaluating DNC

When considering the determination of DNC, the focus has been to maximise the DNC of each coal system whilst maintaining equitability between origin-destinations and avoiding extreme increases in train cycle time. Consideration is also given to balancing cross-system impacts as much as possible.

To assess the maximum capacity of the rail infrastructure it is important to ensure that sufficient demand and sufficient above-rail consists are available to fully utilise the available track infrastructure.

To achieve this, demand within the Model is increased demand beyond 100% of committed capacity (performed evenly across all origin-destination combinations in a system) until the limit of throughput is achieved. In ACAR24, train demand has been increased from 120% of contract (per ACAR23) to 140% of contract in all systems except Newlands-GAPE (which remains at 120%), in order to ensure that there is sufficient demand in periods of highest capacity availability.

In combination with the demand increase, above-rail consist numbers are increased. This requires some careful consideration as additional consists increase network congestion and the law of diminishing returns becomes evident. In practice, consists reach an optimal level beyond which any additional throughput is minimal compared with the cost of the additional above-rail assets and the system-wide cycle time. The IE has applied judgement to determine the practical limit of demand and consist numbers for each system. Further detail regarding this limit is provided for each system.

As a result of this process, the modelled outcomes may not directly reflect how the network is currently performing – in particular, modelled cycle times will be longer.

Although the Model aims to simulate how each coal system operates in practice, it uses simplistic assumptions in certain areas and will not fully replicate the scheduling and execution practices of the network.

Several SOP assumptions used in determining the DNC are constant across the capacity assessment period and/ or represent planned information for only the first year of the five-year period. Although the SOP represent the current/planned operations of the network as at this time, actual results and future events could differ materially from those anticipated.

1.5 Information and Redaction

To the extent possible, this document has been prepared on an aggregated and unredacted basis. Where capacity outcomes contain information that is confidential to an access holder, customer, train operator, or terminal operator and is unable to be disclosed, it has been redacted in this document.

Minor rounding variances between values presented per month and per annum, per mainline and branch line, and per origin/destination may occur in this report.

2. Executive Summary

The IE has prepared the ACAR regarding the DNC of Aurizon Network's CQCN for the capacity assessment period (1 July 2024 to 30 June 2029). This summary provides an overview of the:

- Capacity Assessment outcomes by coal system; and
- major differences between the ACAR24 and ACAR23 results.

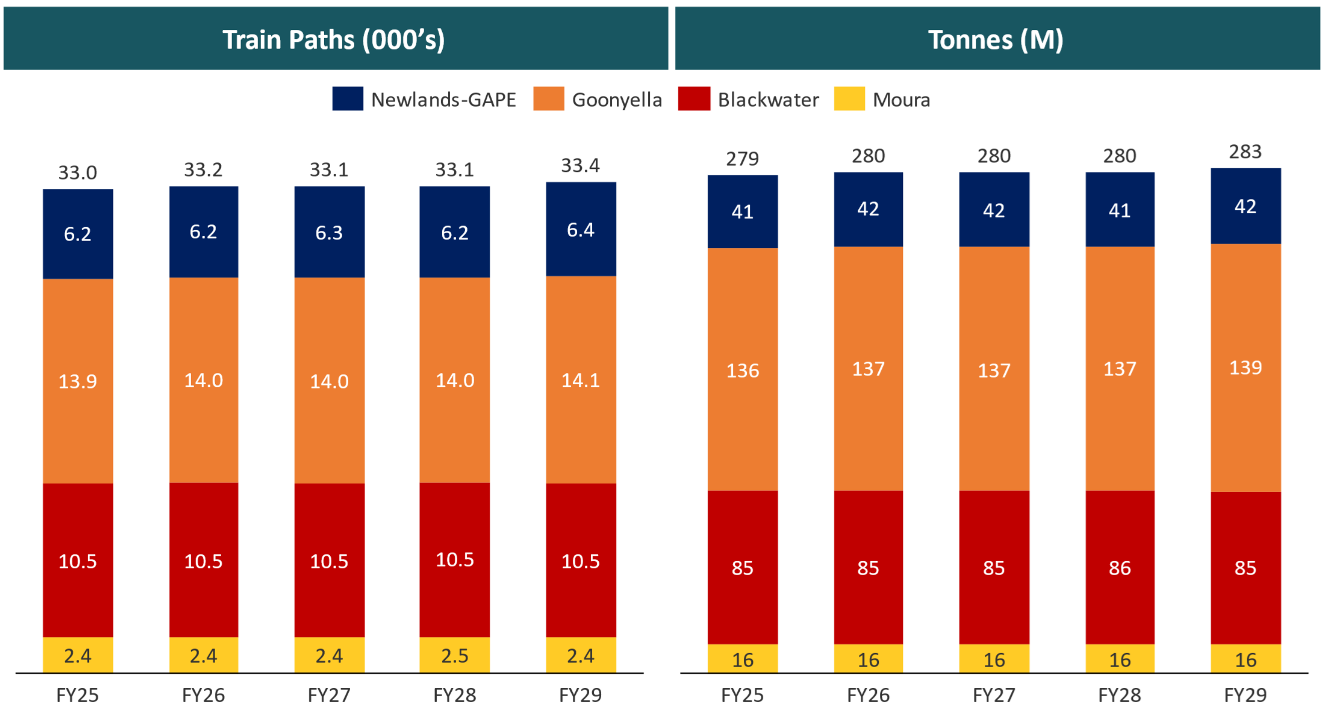
More detailed information on each coal system can be found in **Sections 3-6** of this report.

2.1 Capacity Assessment Outcomes

2.1.1 Deliverable Network Capacity

The IE has determined that the DNC per year for the network over the Capacity assessment period is as shown in **Figure 3.**

Figure 3 - Deliverable Network Capacity by coal system – train paths & tonnes

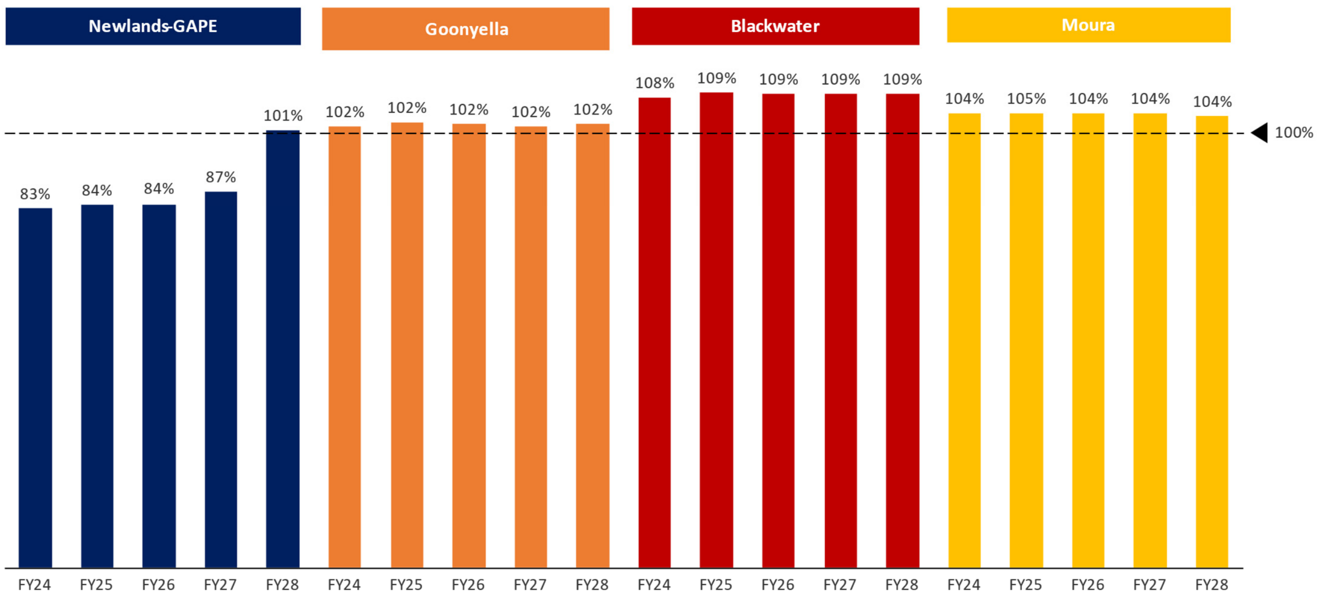


2.1.2 Capacity Deficits

The DNC, as a measure against committed capacity (i.e. the ability of the rail infrastructure to meet its contracted capacity), for each coal system is shown in **Figure 4**.

Of particular note in ACAR24 is that DNC exceeds committed capacity in all systems except Newlands-GAPE, where a deficit is expected to exist until FY29, when a reduction in committed capacity eliminates the deficit.

Figure 4 - % DNC of committed capacity (contract achievement)



2.2 Key Capacity Assessment Changes and Future Opportunities

The IE has continued to refine the Model and the data inputs to ensure the modelling assumptions and outcomes align to how the network operates in practice. For ACAR24, several enhancements have been implemented in the Model and to the operational data received from AN and the supply chain stakeholders.

Improvements implemented this year and those identified for future are detailed below:

2.2.1 Track Maintenance

Track maintenance activities (including renewals) represent the most significant impact on the theoretical capacity of the CQCN rail infrastructure.

For ACAR purposes, AN's maintenance activities are represented by track possessions that affect capacity in four types:

1. Integrated closures – full system shuts ("FSS") and branch line shuts which are included in AN's maintenance renewal and Strategy Budget ("MRSB") scope;
2. Major maintenance – maintenance and renewal tasks included in the MRSB program, excluding Integrated Closures;
3. Minor maintenance – smaller-scale planned maintenance activities (excluding emergency maintenance); and
4. Hi-rail movements – track inspection and other vehicle movements which are represented within AN's systems as track possessions.

The IE's approach to representing these four types of maintenance in ACAR24 is outlined below.

Integrated Closures

Following the finalisation of the annual MRSB, AN develops a list of planned possessions necessary to implement the approved major maintenance and renewals scope (hereafter described simply as "major maintenance").

Principal amongst these possessions are integrated closures which refer to those periods of track possession in which a whole system is closed for maintenance (FSS) or one or more branch lines are similarly closed to rail traffic (branch line shutdowns). Information regarding these planned possessions is provided electronically to CNCC and CNCC utilises this information as an input into the model with few, if any, modifications. Indeed, these integrated closure activities are used in the consideration of other types of maintenance to ensure no "double counting" of maintenance possessions and their capacity impacts occurs.

Of particular note in FY25 is that AN's approved MRSB includes one "contingency" integrated closure (shutdown) in each of the Goonyella and Blackwater systems. The IE has not included these contingency shuts within the ACAR24 assessment of FY25 capacity, but has provided a sensitivity case showing the capacity impact of the contingency shuts.

Major Maintenance

In addition to the integrated closures described above, AN's MRSB scope includes further maintenance tasks that can be accommodated within less extensive possessions, including single-line closures within duplicated track sections. These are referred to in the ACAR analysis as "major maintenance". Like integrated closures, CNCC utilises this information as an input into the model with few, if any, modifications.

Minor Maintenance

While AN scopes tasks and schedules possessions for major maintenance well in advance, other maintenance tasks are required across the network. This includes planned maintenance activities as well as "breakdown" maintenance tasks.

Because these are not (and to some extent cannot) be known well in advance, the IE utilises historical information to understand the extent of minor maintenance which has affected capacity in order to estimate the extent of minor maintenance expected in future. To this end, the IE receives from AN detailed records of historical minor maintenance possessions which detail the location, start and end times (both scheduled and actual) and other categorising information.

Since the ICAR process, the IE has observed and utilised an estimate of approximately 4,000 hours of minor maintenance as being "normal" across the CQCN. This level of maintenance was then scaled up to reflect a full demand environment and applied to the Model.

As part of the ACAR24 process, considerable time was spent examining AN's data to better understand the extent of minor maintenance in the various CQCN systems and to review the previous approach to minor maintenance. This review identified two important factors affecting the consideration of minor maintenance:

- Minor maintenance is being recorded by AN under additional categories than those previously used in CNCC data gathering – these activities have seen an increase over the last four years; and
- Maintenance previously used by CNCC to inform ICAR/ACAR shows signs of increasing.

As shown in the table below, the "Infrastructure Maintenance" category was originally judged to be less than 4,000 possession hours across the CQCN. This increased in CY21 but this data was considered to be insufficient evidence to alter the level of minor maintenance beyond 4,000 hours in ACAR22. That decision appeared justified in ACAR23 when CY22 saw just under 4,000 hours recorded.

The review of CY23 data has challenged the view that CY21 was a "one-off", with "Infrastructure Maintenance" activities increasing to over 5,500 hours (see **Table 1** below for recent historical information). This has led the IE to conclude that ~4,000 hours of minor maintenance is no longer appropriate for assessment of network capacity.

Table 1 - AN Recorded Minor Maintenance Possession Hours – CQCN

CQCN Possession Hours	CY2020	CY2021	CY2022	CY2023
“Infrastructure Maintenance”	3,726	5,487	3,917	5,559
Other Minor Maintenance	1,139	1,450	1,464	1,655
Total Minor Maintenance	**4,866**	**6,936**	**5,381**	**7,214**
Total throughput (Mt)	214.0	209.4	204.6	211.1

For the purposes of ACAR24, CNCC has assessed the appropriate level of minor maintenance for each system based on a review of each category and sub-category of minor maintenance at a system level. AN’s future MRSB maintenance plans were reviewed for activities meeting these criteria which were “credited” and excluded from the minor maintenance process.

Table 2 - ACAR Minor Maintenance Treatment

FY25 - Minor Maintenance Possession Hours	Full Demand	Already Scheduled	Included in ACAR 2024
Newlands-GAPE	313	11	302
Goonyella	1,919	94	1,825
Blackwater	2,779	218	2,561
Moura	585	48	537
Total	**5,596**	**371**	**5,225**

The impact of minor maintenance in each system is shown as a sensitivity in each system’s section of this report.

Hi-Rail Activities

Infrastructure inspections are carried out using a hi-rail vehicle, a car fitted with wheels that allow the car to travel on the rail infrastructure. These inspections are scheduled and the Model makes the section of the track unavailable for coal services during the time when hi-rail is on the section.

There has been no change to the methodology of including hi-rail movements in the capacity model in ACAR24, however updated CY23 data was examined and utilised for future periods.

2.2.2 Above-rail Consists

The Model requires allocation of available above-rail operator fleets to each mine in a system. As outlined in the 2024 SOP document, the IE has adopted an approach of allocating one or more of the third-party operators to a mine depending on the proportion of CY23 railings performed by those operators. If more than 80% of a mine’s operation is performed by one operator, only that operator is allocated to that mine. If less than 80% is performed by one operator, all operators railing more than 20% of CY23 volumes were allocated to that mine. Dedicated rail operators are restricted to operating to their related mines.

The number of consists utilised within a system is an important parameter in determining system capacity. With too few consists, track capacity is not fully utilised but with too many consists, network congestion increases cycle times, reduces consist utilisation and, eventually, reduces capacity. There is no clear direction in UT5 as to how tradeoffs between these factors should be managed. As a result, the ACAR assessment reflects that IE’s judgement on this issue, but the report seeks to provide some additional insight for readers into these tradeoffs.

2.2.3 Future Opportunities

As part of each ACAR process, the CNCC team identify opportunities for improvement of the Model's ability to represent the operation of the network. Not all opportunities can be addressed immediately but will become part of an improvement program. From the ACAR24 process, a number of high priority opportunities will be pursued by CNCC:

- An improved understanding of the drivers of major maintenance possessions over the medium term (five-year period);
- Assessment of the impacts of maintenance timing (ie concentration of activities into certain days and/or times) on capacity;
- An improved ability to distinguish between maintenance activities that consume network capacity and those "opportune" maintenance activities that fall within the shadow of other activities and do not further reduce capacity;
- Analysis of terminal demand where even railings assumptions might no longer be the most appropriate modelling approach;
- Analysis of yard operations and associated congestion;
- Re-allocation of system delays between the primary cause and secondary impacts; and
- Representation of TSRs – appropriately balancing frequent low-impact restrictions as well as low-frequency but high impact restrictions.

2.3 ACAR Report Changes

The ACAR report continues to present an indicative view of changes in capacity since ACAR23. In ACAR24 however, a revised presentation of capacity sensitivities now provides a more meaningful quantification of factors affecting aggregate capacity in each system.

In addition to the customary allocation of system DNC to each branch line, ACAR24 now includes an explicit sensitivity assessment of capacity in each branch line, intended to provide stakeholders with a more thorough understanding of the modelled view of capacity in different parts of the CQCN.

3. Newlands and GAPE Systems

3.1 Overview of Newlands and GAPE systems

A map of the Newlands and GAPE systems is provided in **Figure 5**. It shows the coal system and each mainline and branch line that makes up the Newlands and GAPE systems. It also shows the branch lines that feed any committed capacity to the GAPE system from the Goonyella system and to the Newlands system.

The Newlands system refers to the rail infrastructure comprising the rail corridor from the terminal at NQXT to Newlands mine. The Newlands system rail infrastructure is also used by GAPE system traffic and for traffic from Bravus' Carmichael Private Network (CRN).

The GAPE system refers to the rail infrastructure comprising the rail corridor from North Goonyella Junction to Newlands Junction. There are a number of contracts that originate from the Goonyella system that traverse through the GAPE system. These are via branch lines 3F Blair Athol Mine to Wotonga, 3E North Goonyella Mine to Wotonga, 3C Oaky Creek Junction to Coppabella and 3D Coppabella to Wotonga.

The close integration of the GAPE and Newlands systems mean that these systems are effectively modelled as one system for the purposes of capacity assessment. As a result, ACAR24 reporting for these systems is provided primarily on a combined basis. For the purposes of strict compliance with UT5, which requires reporting on each system, separate Newlands and GAPE capacity information is included in **APPENDIX A: Newlands System Information** and **APPENDIX B: GAPE System Information**.

Figure 5 - Newlands and GAPE systems

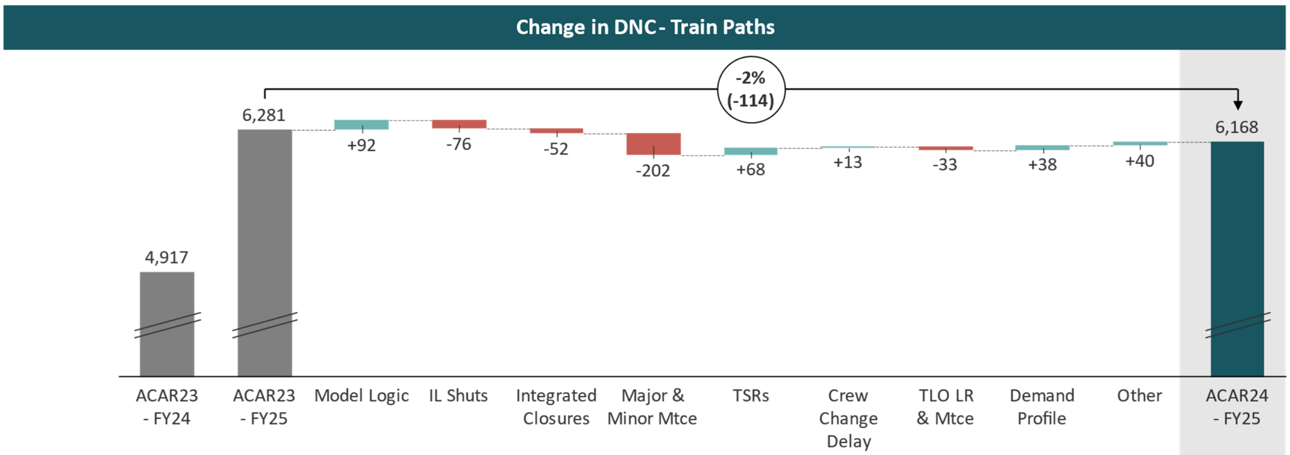
3.2 Deliverable Network Capacity

3.2.1 Summary

The combined Newlands-GAPE system DNC has seen a very minor reduction in FY25 capacity of ~110 trains since ACAR23. This has been partially offset by an increase in median payload (+1.4%) resulting in capacity in tonnage terms decreasing to 41.0Mt. This represents an increase of ~1,250 train paths or 8.4Mt above FY24 capacity, with the most significant factor being the inclusion of RCS signalling ("RCS") from July 2024.

Figure 6 provides an indicative breakdown of the changes from ACAR23 to ACAR24 for FY25, which are discussed in more detail in the remainder of this section.

Figure 6 – Indicative Newlands and GAPE changes from ACAR23 to ACAR24 – FY25

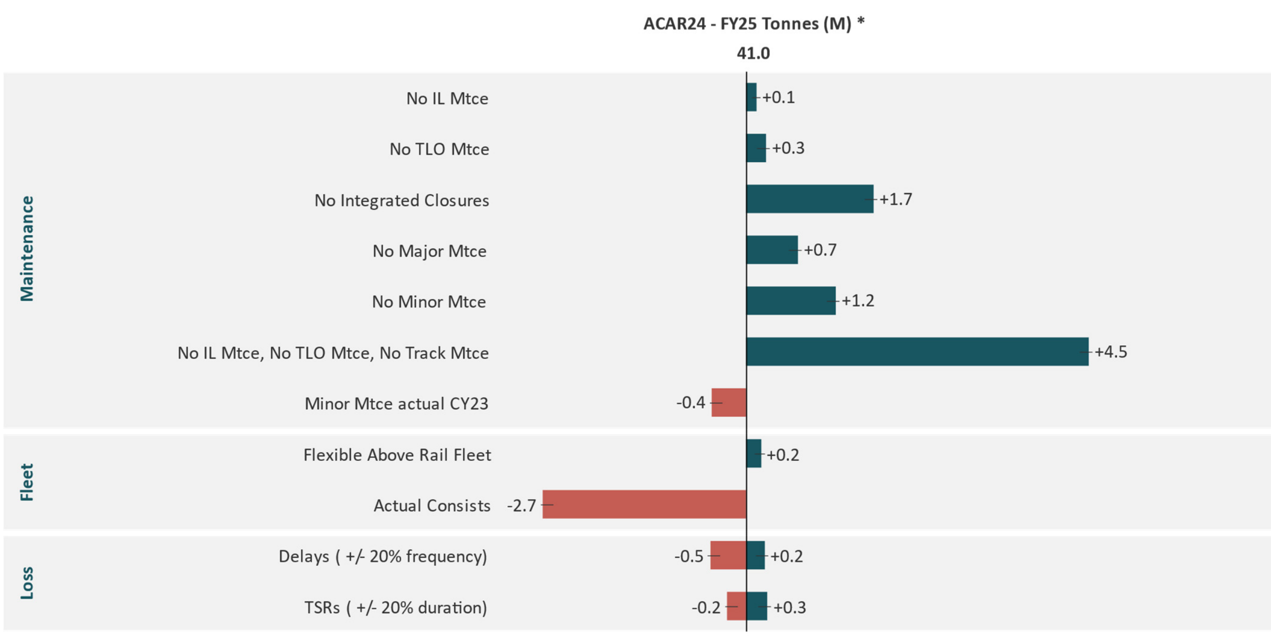


Tonnes (M) *	32.7	41.8	0.6	-0.5	-0.3	-1.3	0.5	0.1	-0.2	0.3	0.3	41.0

* Tonnes are calculated using the ACAR24 FY25 average payload.

An assessment has also been performed of the impact on Newlands-GAPE system DNC of changes to key operating parameters, these are represented in tonnes in **Figure 7** below.

Figure 7 - Newlands and GAPE sensitivity impact to DNC for key operating parameters – FY25



* Sensitivity outcomes are represented in Tonnes, calculated using the ACAR24 FY25 average payload.

3.2.2 Changes to Model Logic

Changes to model logic for ACAR24 includes a number of aspects relating to the Newlands-GAPE system.

Of particular note are assumptions regarding RCS. Implementation of RCS in FY25 was included in ACAR23, however since then there have been several changes to the project's anticipated impact and these changes form part of the overall change in FY25 capacity.

RCS was originally anticipated for installation in March 2024 which has since been revised to July 2024. ACAR23 had however, adopted a simplified assumption of implementation in July 2024 (to align with the new financial year), so there is no impact to the capacity assessment from the delay that has been experienced. A more material impact to capacity has been the change in the anticipated headway reduction and path timing provided by RCS. At the time of approval, RCS was anticipated to allow reduction of headways from 60 minutes to 36 minutes. Challenges in the operational implementation have seen an amended scheduling protocol based on 45-minute separation. This has resulted in a reduction in the expected capacity benefit of RCS of 1.4 to 1.9Mt, although this impact has been offset by changes to model logic that ensure trains are not despatched to TLOs for branch lines that are undergoing maintenance.

Although further TAs have been studied by AN and a recommendation provided to users, with the exception of RCS discussed above, no additional TAs have been included in ACAR24.

Changes have also been made to the model logic to ensure that trains are not dispatched to TLOs or branch lines that are undergoing maintenance. In addition, representation of Goonyella integrated closures has been modified to ensure that where full system shuts prevent access to DBCT and HPCT but do not affect certain branch lines, that GAPE trains can continue to service accessible mines.

3.2.3 Terminal and Track Maintenance

Terminal Maintenance

CNCC has obtained specific plans for Inloader maintenance from NQXT for the Abbott Point terminal. This data now indicates where maintenances shutdowns cannot be accommodated with AN's full system or branch line shutdowns such that the Inloader maintenance will affect network capacity.

The revised Inloader maintenance plans for NQXT include a number of shutdowns, which are aligned with, and accommodated within, planned network shuts, with two exceptions, involving [redacted] of downtime respectively outside the network shut (note both of these outages affect the two inloaders simultaneously). In addition, there are a series of short Inloader shuts outside network shuts [redacted] throughout the year which are included in the model. The net impact of these changes is a decrease in network capacity of 76 train paths or approximately 0.5Mt.

In aggregate, Inloader maintenance outside network shuts reduce Newlands-GAPE system DNC by approximately 20 train paths (~0.1Mt).

During the review of CY23 data, the IE did observe a modest increase in unplanned delays at the NQXT inloaders. ACAR24 includes a revised assumption for this parameter reflecting the most recent data.

Track maintenance

As discussed in **section 2.2.1**, the Model directly incorporates AN's planned maintenance programs, including integrated closures, consistent with the approved MRSB scope.

As outlined in AN's MRSB documentation, maintenance-related integrated closure possession hours will be 15% higher in FY25 than in FY24. This excludes the scheduled 76 hour shut in July 2024 which is required for the final implementation of the RCS TA discussed above. The IE has included the RCS shut within the integrated closure category for the Newlands system for FY25. Changes to the integrated closure possessions for FY25 (including the RCS shutdown) have reduced capacity by 52 train paths (~0.3Mt).

ACAR24 also includes AN's planned major maintenance activities outside integrated closures and, as discussed in **section 2.2.1**, the IE has revised the estimate of future minor maintenance activities based on a review of maintenance activities from CY20 to CY23.
These major and minor track maintenance activities have reduced capacity by 202 train paths (1.3Mt) compared with ACAR23. In aggregate, major and minor maintenance outside integrated closures in FY25 has been assessed as reducing Newlands-GAPE system DNC by approximately 280 train paths (~1.9Mt).

If minor maintenance were to occur consistent with the levels of maintenance observed in CY23 (rather than based on CY20 – CY23), it would reduce the FY25 DNC by a further ~70 train paths (~0.4Mt).

3.2.4 TLO Maintenance

When one or more TLOs in a system is closed for maintenance, this can concentrate train movements to those TLOs remaining open. The concentration can cause localised congestion and, in turn, reduce capacity.

The IE has examined TLO closures in CY23 and prior years, to try to determine a "normal" level of TLO closures in the CQCN. Data regarding closures is collected by AN planning systems and has been provided to the IE. This data has been reviewed to determine when TLOs were closed for maintenance activity. Closure periods that overlapped with full system shutdowns or applicable branch line shutdowns were excluded, as were closures recorded against TLOs with no contractual capacity or where the applicable mine was shut.

In the Newlands-GAPE system, approximately 650 hours of TLO shutdown were recorded (this includes Goonyella system TLOs served by GAPE). The majority of these hours were comprised of short-duration routine maintenance activities.

As the IE has no clear forecast of expected TLO maintenance in FY25, FY25 TLO maintenance has been based on CY23 maintenance levels (as modified in the analysis described above).

In aggregate, TLO maintenance in the Newlands-GAPE system reduced DNC by approximately 40 train paths (~0.3Mt).

3.2.5 Demand Presentation

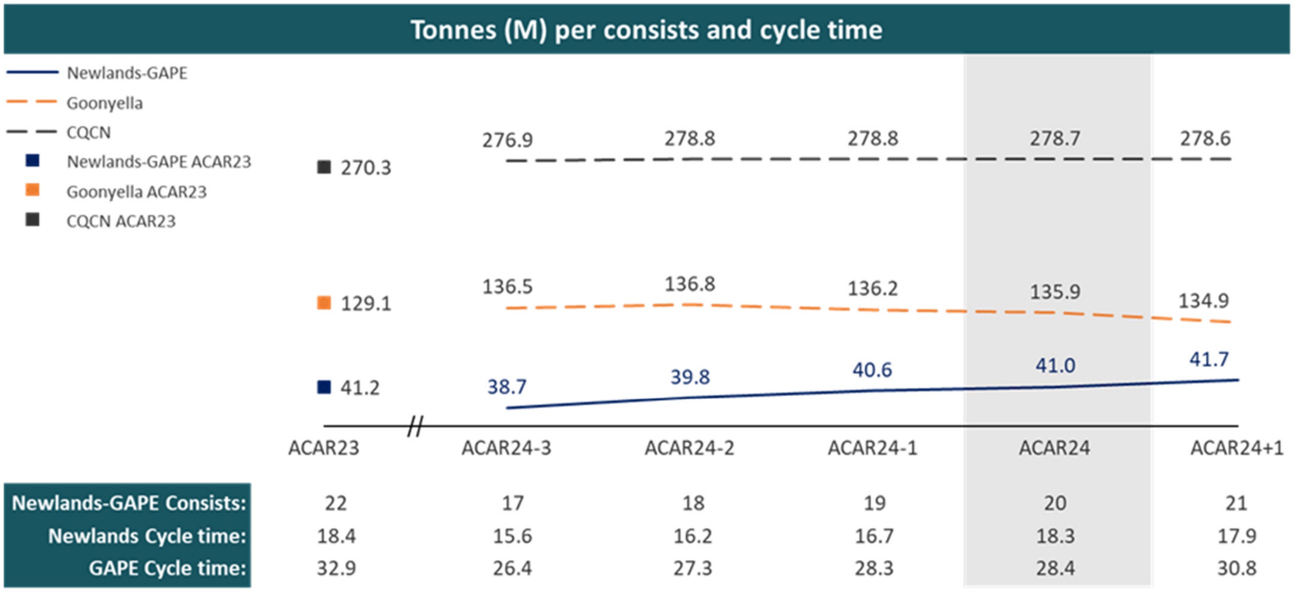
As discussed in the ACAR23 report released in June 2023, the IE models NQXT as an even-railings terminal and distributes each mine's contractual demand evenly across each month.

[redacted]

3.2.6 Above-rail Fleet Assumptions

Consistent with previous years' assessments, the IE has optimised consist numbers within ACAR24 to ensure that above-rail capacity is not a constraint on DNC. In ACAR24, Newlands-GAPE consists were set at 20, spread across the three operators – two consists fewer than ACAR23. This was determined as the optimal outcome considering the impact of consist numbers on the Newlands-GAPE system throughput (including evenness of origin-destination achievement) and cycle time while also considering the impact on throughput in other CQCN systems, particularly Goonyella.

Figure 8 - Newlands-GAPE Consist sensitivity



As discussed in **section 2.2.2**, above-rail operators are allocated to mines based on CY23 railings. The IE has undertaken a sensitivity of the impact of above-rail allocation, by allowing all third-party operators to operate to all mines. In the Newlands-GAPE system, DNC increased by approximately 30 trains (~0.2Mt) under this scenario, suggesting minimal constraint within the base case due to above-rail fleet allocation.

A further sensitivity was conducted by restricting above-rail assets to current consist numbers. In the Newlands-GAPE system, this sensitivity resulted in a DNC of 5,770 trains (~38.5Mt). Note that dedicated above-rail providers and mines with exclusive above-rail fleets were not adjusted as part of these sensitivities.

3.2.7 Other Throughput Impacts

Updates to the crew change delay, TSR assumptions and demand mix provided a minor improvement in Newlands-GAPE throughput.

3.3 Cycle Times

As DNC is evaluated on a higher number of consists to support unconstrained demand, modelled cycle times may be higher than those required to deliver contractual demand.

The FY25 median modelled train cycle time for Newlands-GAPE of 25.2 hours has reduced by 9% (2.6 hours) compared to ACAR23. This represents a significant reduction from the ACAR23 FY24 cycle time of 31.7 hours reflecting, in part, the benefits of the introduction of RCS.

Table 3 - Newlands-GAPE Cycle Time

Cycle Time (Hours)	FY24 (ACAR 2023)	FY25 (ACAR 2023)	FY25 (ACAR 2024)	FY25 Change
Newlands	20.5	18.4	18.3	-1%
GAPE	37.3	32.9	28.4	-14%
Newlands-GAPE	31.7	27.8	25.2	-9%

3.4 Committed Capacity

Committed capacity for FY25 to FY27 remains unchanged since the publication of ACAR23, with a very minor decrease in FY28 committed capacity.

A more substantial reduction in committed capacity in FY29 is now evident, with a reduction of 844 train paths due to confirmation of non-renewal of a tranche of GAPE capacity expiring in FY28.

It should be noted that the IE is required by UT5 to assume the renewal of expiring capacity where that capacity carries renewal rights.

Based on publicly available information, it appears likely that other GAPE contracts are due for expiry by mid-2028, including capacity held by non-producing customers.

While it is possible that this capacity may be transferred to eligible customers prior to expiry and subsequently renewed, it appears likely that FY29 committed capacity will reduce further.

3.5 DNC and Available Capacity/Existing Capacity Deficit

The FY25 DNC of 6,168 train paths (an increase of 1,251 over the ACAR23 FY24 DNC) and with committed capacity remaining at 7,460 train paths leaves the Newlands-GAPE system with an **existing capacity deficit** of 1,293 train paths in FY25 – equivalent to 8.6Mt at median expected payload. By FY29 however, based on current assumptions, the existing capacity deficit will be eliminated, with a very minor available capacity of 47 trains or 0.3Mt, largely due to the reduction in committed capacity expected by that time.

Capacity outcomes for all years of the ACAR period is outlined below in **Figure 9** in Train Paths and **Figure 10** in Tonnes.

Figure 9 - Newlands and GAPE summary for FY25 to FY29 (Train Paths)

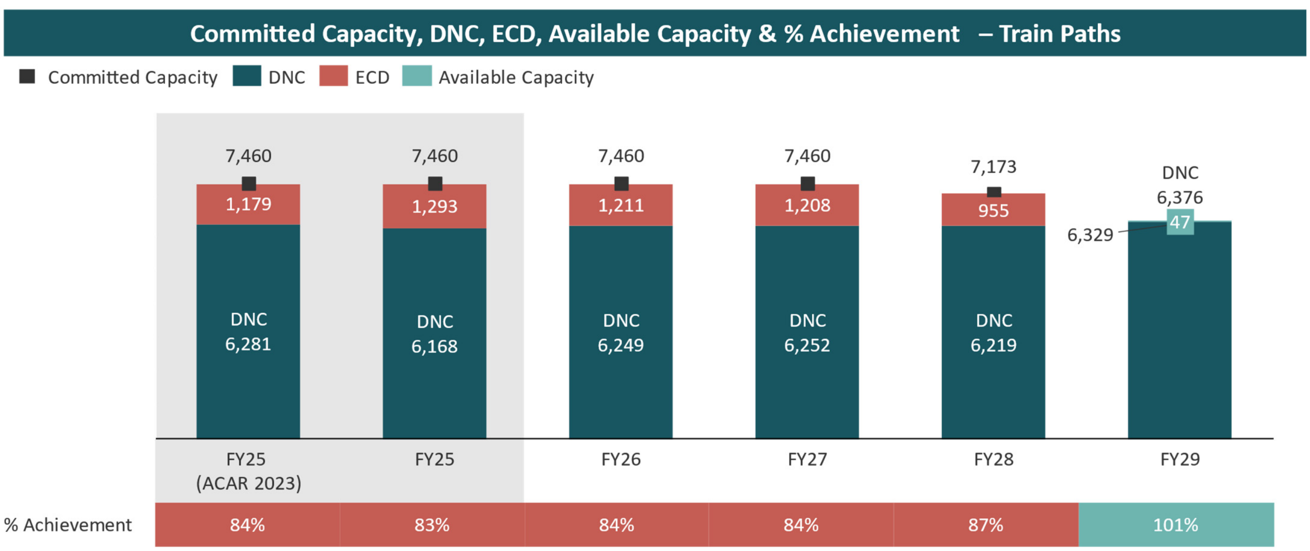
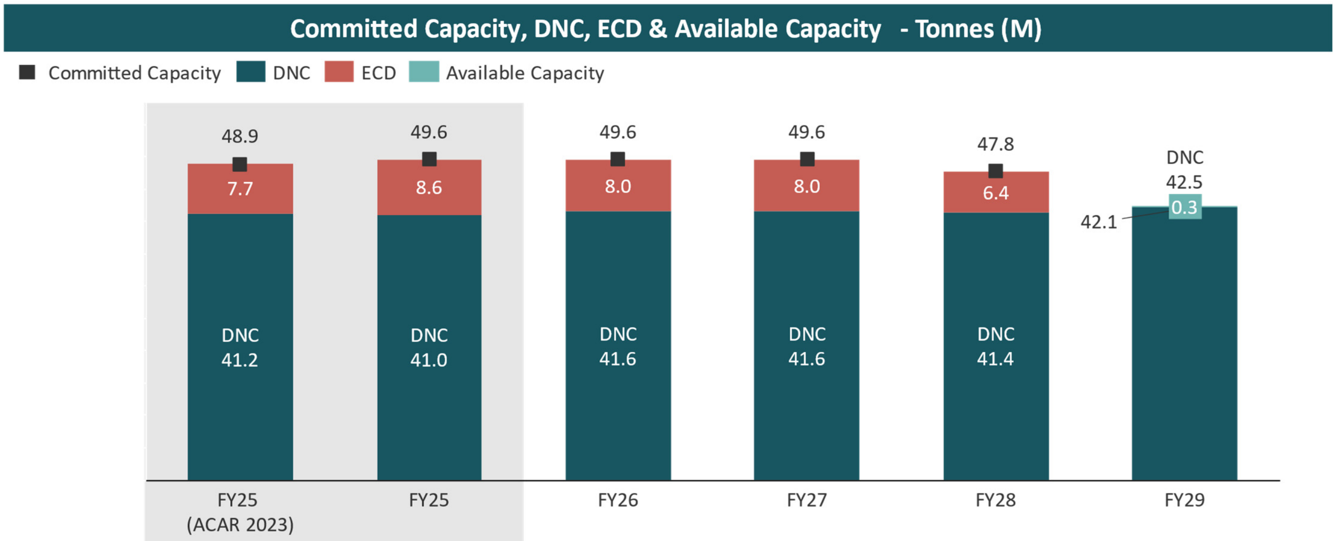


Figure 10 - Newlands and GAPE summary for FY25 to FY29 (Tonnes)



The DNC calculated separately for the Newlands and GAPE systems by month for the five-year assessment period is shown in **APPENDIX A: Newlands System Information** and **APPENDIX B: GAPE System Information.**

3.6 Capacity Variability

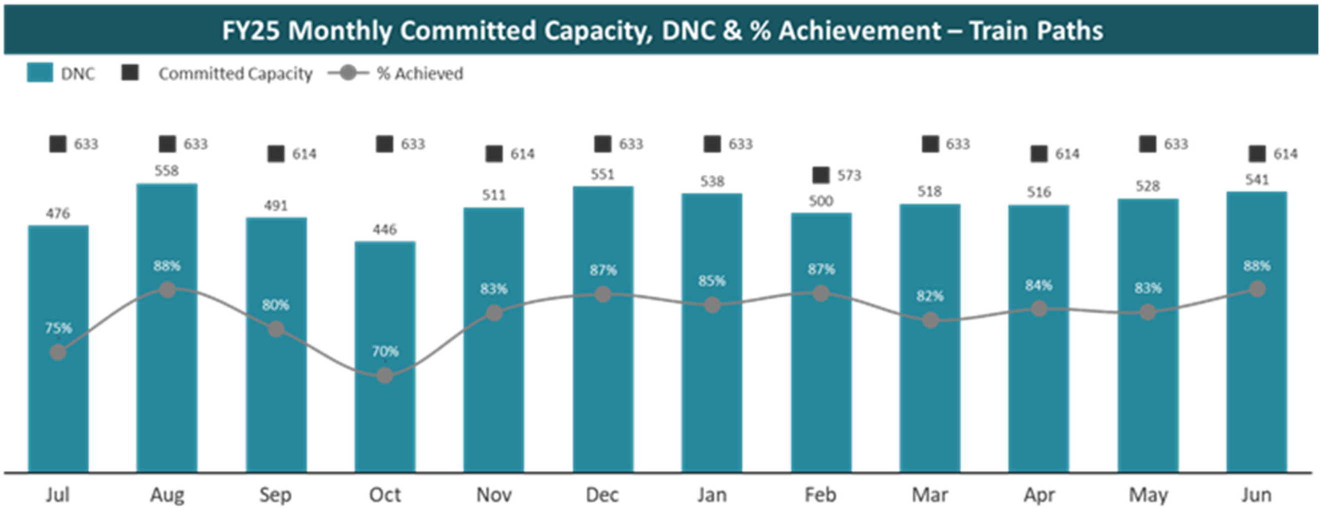
The ACAR24 Newlands-GAPE system DNC for FY25 of 6,168 train paths represents the median of 50 model simulation runs. The P90 to P10 range of the DNC was from 6,123 to 6,258 train paths (2.2%) as shown in **Table 4**. None of the model runs achieved committed capacity for FY25.

Table 4 - Newlands-GAPE DNC – model variability

Model seed variability - 50 seeds - FY25					
Probability	P90	P75	Median	P25	P10
DNC (Train Paths)	6,123	6,131	6,164	6,205	6,258
DNC (Tonnes M)	40.7	40.8	41.0	41.3	41.7
Variability to median	-0.7%	-0.5%		0.7%	1.5%
Committed Capacity	7,460				

Although DNC is most frequently discussed in annual terms, the IE is required to determine each system's capacity on a monthly basis. FY25 monthly capacity in the Newlands-GAPE system is reasonably stable, ranging from 446 to 558 train paths, as shown in **Figure 11** below. (Monthly capacity for the full five-year period of the ACAR model is shown in **APPENDIX A: Newlands System Information** and **APPENDIX B: GAPE System Information**).

Figure 11 – Newlands-GAPE FY25 Monthly Capacity



3.7 Capacity Constraints

3.7.1 Mainline and Branch line DNC

The IE is required to determine DNC for each system's mainline and branch lines. In determining system DNC, the IE increases demand for each origin-destination pair in a system simultaneously until the maximum throughput is reached. The DNC, committed capacity and ECD values, where applicable, per mainline and branch line for Newlands-GAPE are outlined below in **Table 5** (in both train paths and tonnes).

Note that the table below shows a very minor deficit in branch 2B of the GAPE system. The IE does not consider this to be representative of an ECD in the GAPE system but is due to the interplay of the Newlands and GAPE systems in the modelling.

Table 5 - Newlands and GAPE values per Mainline and Branch line for FY25 to FY29

System	Mainline / Branch Line	Committed Capacity					DNC					ECD				
		FY25	FY26	FY27	FY28	FY29	FY25	FY26	FY27	FY28	FY29	FY25	FY26	FY27	FY28	FY29
Train Paths																
Newlands-GAPE	1 M.L. - Collinsville to Pring	7,460	7,460	7,460	7,173	6,329	6,168	6,249	6,252	6,219	6,376	1,293	1,211	1,208	955	-
	1A B.L. - Pring to Abbot Point	7,460	7,460	7,460	7,173	6,329	6,168	6,249	6,252	6,219	6,376	1,293	1,211	1,208	955	-
	1B B.L. - Newlands Mine to Collinsville	7,460	7,460	7,460	7,173	6,329	6,168	6,249	6,252	6,219	6,376	1,293	1,211	1,208	955	-
GAPE	2A B.L. - North Goonyella Junction to Newlands Junction	4,345	4,345	4,345	4,047	3,214	3,421	3,470	3,465	3,344	3,210	924	876	881	704	5
Tonnes (M)																
Newlands-GAPE	1 M.L. - Collinsville to Pring	49.6	49.6	49.6	47.8	42.1	41.0	41.6	41.6	41.4	42.5	8.6	8.0	8.0	6.4	-
	1A B.L. - Pring to Abbot Point	49.6	49.6	49.6	47.8	42.1	41.0	41.6	41.6	41.4	42.5	8.6	8.0	8.0	6.4	-
	1B B.L. - Newlands Mine to Collinsville	49.6	49.6	49.6	47.8	42.1	41.0	41.6	41.6	41.4	42.5	8.6	8.0	8.0	6.4	-
GAPE	2A B.L. - North Goonyella Junction to Newlands Junction	28.8	28.8	28.8	26.9	21.4	22.7	23.0	23.0	22.2	21.4	6.1	5.8	5.8	4.7	0.0

3.7.2 Branch line Capacity and System Constraints

The allocation of system DNC to branch lines shown in **section 3.7.1** above does not necessarily demonstrate the full potential capacity of each branch line in the Newlands-GAPE system.

In order to test the capacity limits of different sections of the Newlands-GAPE system, the IE has undertaken a series of model sensitivities. This involves increasing capacity in various sections of the system to reach their practical limit.

The current constraint appears to be in branch line 1B, based on longest headway - currently Almoola to Birralee, where maximum capacity is aligned with DNC. This section has been the focus of the current TAs study work.

The IE has modelled the capacity of branch line 2A North Goonyella Junction to Newlands Junction (the "Northern Missing Link") has modelled the capacity by reducing demand in the Newlands system to ensure that the Newlands mainline is no longer a constraint on branch 2A. This analysis suggests that there is additional capacity in branch 2A, and that this branch line has sufficient capacity to satisfy all its current committed capacity. The IE considers there is likely to be capacity beyond the values specified in **Table 6,** however accurately assessing this would require significant changes to a range of Newlands system operating parameters an exercise the IE has not undertaken.

Table 6 - Branch line Sensitivity per month

Branch Line Capacity in excess of Committed Capacity - FY25													
Line	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
1A B.L. - Pring to Abbot Point	-145	-65	-130	-175	-110	-70	-85	-120	-105	-105	-95	-80	-1,285
1 M.L. - Collinsville to Pring	-145	-65	-130	-175	-110	-70	-85	-120	-105	-105	-95	-80	-1,285
1B B.L. - Newlands Junction to Collinsville	-145	-65	-130	-175	-110	-70	-85	-120	-105	-105	-95	-80	-1,285
2A B.L. - North Goonyella Junction to Newlands Junction	+20	+95	+35	-15	+65	+90	+70	+35	+40	+50	+85	+85	+655

3.8 Risks to Capacity

ACAR24 represents a "point in time" assessment of network capacity, driven by the data observable at this time. Future network capacity will remain subject to variation through any one or more of the model inputs included in ACAR24.

Several factors specific to the Newlands-GAPE system are worthy of mention as risks to capacity.

As stakeholders will be aware, AN has recently concluded their Newlands Transitional Arrangements Concept Study and issued their report. AN is recommending the implementation of two Transitional Arrangements (Almoola signal and Collinsville daytime operations). If implemented, CNCC modelling anticipates a benefit to the system of approximately 2.5Mt at modest capital cost. These benefits are not included in ACAR24 and represent a potential upside to the DNC described in this report.

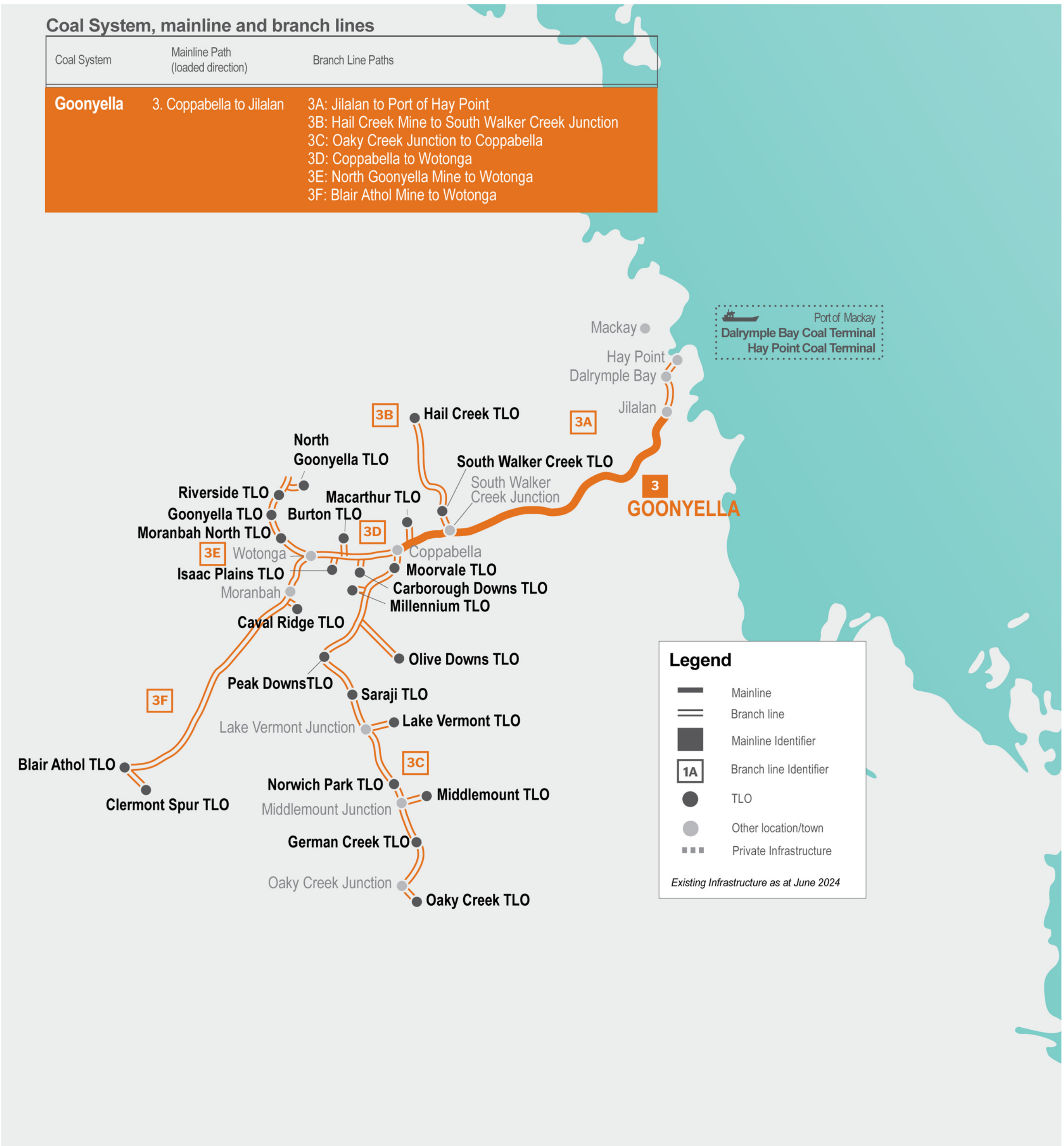
The most significant downside risk to the ACAR24 DNC forecasts likely lies in the vicinity of the Pring Yard and the Pring to Port "mini cycle". Discussion of congestion in this area has been ongoing for some time. The IE is aware that there may be shortcomings in the Model's treatment of this part of the system. An improved understanding of these issues may result in future changes to DNC.

4. Goonyella System

4.1 Overview of System

A map of the Goonyella system is provided in **Figure 12** shows the system and each mainline and branch line that makes up the Goonyella system, incorporating the rail infrastructure comprising the rail corridor from the terminals at the Port of Hay Point (i.e., Hay Point Services Coal Terminal and Dalrymple Bay Coal Terminal) to the Hail Creek mine, the Clermont mine, the North Goonyella mine and the junction with the Oaky Creek branch line and all spur lines directly connecting coal mine loading facilities to those corridors.

Figure 12 - Goonyella System



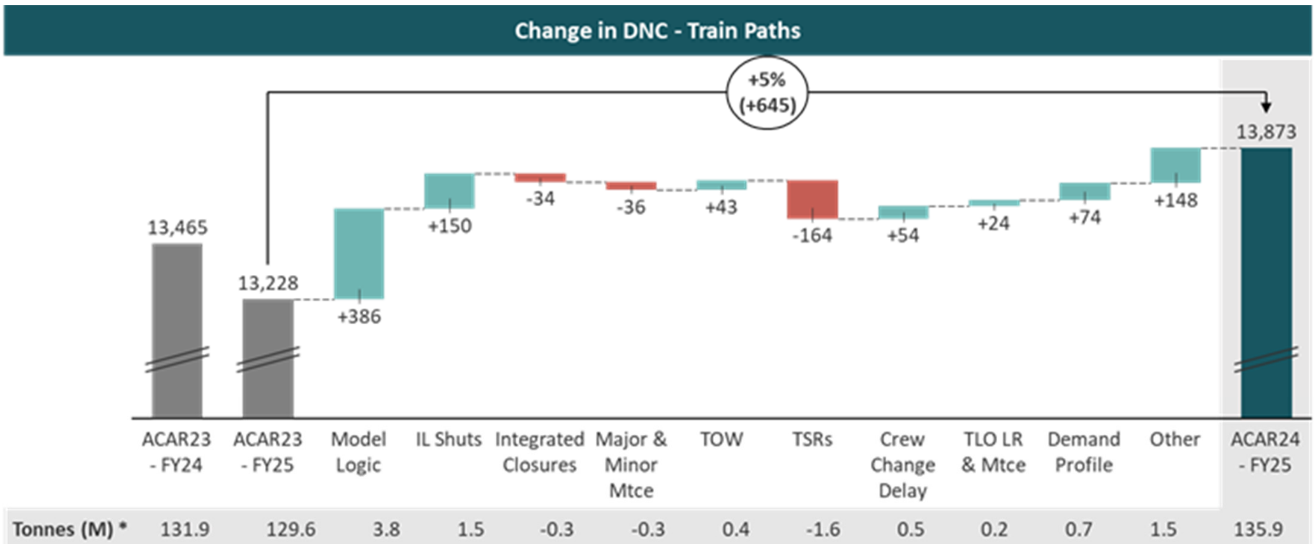
4.2 Deliverable Network Capacity

4.2.1 FY25 DNC

The FY25 Goonyella system DNC has seen a substantial increase of ~650 train paths (+5%) compared with ACAR23 to 13,873 train paths. Median payload increased only marginally and thus capacity rose by 6.8Mt (+5%) to 135.9Mt.

Figure 13 provides an overview of changes from ACAR23 to ACAR24 for FY25. Capacity has been affected by three material factors and a number of smaller factors which are outlined in this section.

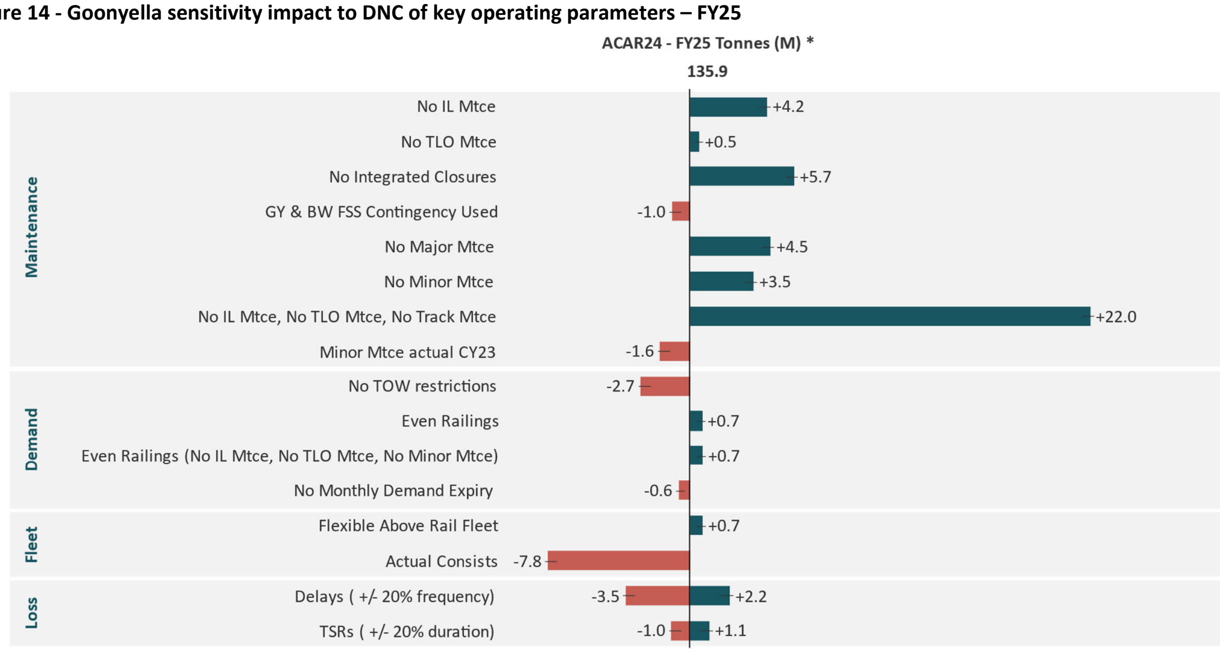
Figure 13 – Indicative Goonyella changes from ACAR23 to ACAR24 – FY25



* Tonnes are calculated using the ACAR24 FY25 average payload.

An assessment has also been performed of the impact on Goonyella system DNC of changes to key operating parameters, these are represented in tonnes in **Figure 14** below.

Figure 14 - Goonyella sensitivity impact to DNC of key operating parameters – FY25



* Sensitivity outcomes are represented in Tonnes, calculated using the ACAR24 FY25 average payload.

4.2.2 Changes to Model Logic

Changes have been made to the model logic to ensure that trains are not dispatched to TLOs or branch lines that are undergoing maintenance.

4.2.3 Terminal and Track Maintenance

Terminal Maintenance

Planned maintenance information was updated based on advice from the terminal operators. DBCT Inloader closures occurring outside system shuts were reduced [redacted], with one Inloader undergoing a major shutdown outside network shuts in July of each year of the ACAR period (rotating through the three inloaders). Aggregate HPCT maintenance hours outside network shuts reduced very marginally.

As part of the model preparation process, the dates of Inloader shutdowns are shifted to maximise alignment with AN's advised integrated closures and therefore minimise the capacity impact. Where DBCT and HPCT advised of shuts occurring in the same month, the IE has shifted the dates to ensure that there are not two planned Inloader shutdowns occurring at the same time.

The impact of updates to Inloader maintenance has been an improvement in capacity of 150 train paths (~1.5Mt). Taken in aggregate, terminal Inloader maintenance outside system shuts reduces Goonyella system DNC by approximately 430 train paths (~4.2Mt).

Note also that based on a review of CY23 data, there were no evident changes in the inloading rate performance or unplanned delay behaviour of the inloaders at DBCT or HPCT and no changes have been made to these model parameters.

Track maintenance

As discussed in **section 2.2.1**, the Model directly incorporates AN's planned maintenance programs, including integrated closures, consistent with the approved MRSB scope. As outlined in AN's MRSB documentation, integrated closure possession hours will be 8% higher in FY25 than in FY24 (excluding the contingency closure). Changes to the integrated closure possessions for FY25 have reduced capacity by approximately 30 train paths (~0.3Mt).

ACAR24 also includes AN's planned major maintenance activities outside integrated closures and, as discussed in **section 2.2.1**, the IE has revised the estimate of future minor maintenance activities based on a review of maintenance activities from CY20 to CY23.

These major and minor track maintenance activities have reduced capacity by approximately 35 train paths (0.3Mt) compared with ACAR23. In aggregate, major and minor maintenance outside integrated closures in FY25 has been assessed as reducing Goonyella system DNC by approximately 810 train paths (~8.0Mt).

If minor maintenance were to occur consistent with the levels of maintenance observed in CY23 (rather than based on CY20 – CY23), it would reduce the FY25 DNC by a further ~170 train paths (~1.6Mt).

4.2.4 Trains on Way

The IE has been made aware of additional functionality within the model that allows optimisation of the mixture of trains dispatched from Jilalan with respect to their unloading destination (previously rail despatch was limited only by the number of trains on way to each loadpoint). Use of this additional setting allows port-related congestion to be more closely managed in the Model and additional capacity released. Considered in isolation this provided a benefit to modelled FY25 Goonyella capacity of 280 train paths (~2.7Mt).

4.2.5 Crew Changes and TSRs

A change to the assessment of crew change delays has provided a modest increase in Goonyella system capacity.

Updates to TSR assumptions based on a review of TSRs in the past three years saw a reduction in capacity expected in FY25 of approximately 160 train paths (~1.6Mt).

4.2.6 TLO Maintenance

When one or more TLOs in a system is closed for maintenance, this can concentrate train movements to those TLOs remaining open. The concentration can cause localised congestion and, in turn, reduce capacity.

The IE has examined TLOs closures in CY23 and prior years, to try to determine a "normal" level of TLO closures in the CQCN. Data regarding closures is collected by AN planning systems and has been provided to the IE. This data has been reviewed to determine when TLOs were closed for maintenance activity. Closure periods that overlapped with full system shutdowns or applicable branch line shutdowns were excluded, as were closures recorded against TLOs with no contractual capacity or where the applicable mine was shut.

In the Goonyella system, approximately 2,600 hours of TLO shutdown were recorded. Approximately half of this amount related to extended shutdowns at two major TLOs, with the remainder comprised of short-duration routine maintenance activities.

As the IE has no clear forecast of expected TLO maintenance in FY25, FY25 TLO maintenance has been based on CY23 maintenance levels (as modified in the analysis described above). The updates to TLO maintenance assumptions improved capacity by approximately 25 train paths (~0.2Mt). In aggregate, TLO maintenance in the Goonyella system reduced DNC by approximately 50 train paths (~0.5Mt)

4.2.7 Demand Presentation

As discussed in the ACAR23 report released in June 2023, the IE models most terminals in the CQCN as operating with even-railings, meaning that a mine's monthly contractual demand for trains is evenly distributed across the month. Given DBCT is operating as a cargo assembly terminal, its demand is not represented in this manner.

In a full supply chain model, DBCT's rail demand would be determined based on the shipping queue and terminal stockpile requirements. As discussed in **section 1.3.1** however, the IE has interpreted UT5's requirements that DNC be determined based on a limited subset of the supply chain (from the TLO to terminal Inloader), as excluding the modelling of the stockpiles, berths and ship queue. As a result, rail demand must be presented to the model via an approximate representation of demand, rather than explicitly simulating rail demand.

With the introduction of flexible cargo assembly windows in mid-2022, the Model has represented monthly DBCT rail demand as being divided into a series of five 6-day windows, with mines' demand in any 6-day period spread evenly across that period (but noting that smaller mines may not have shipments and therefore rail demand in every 6-day period). This approach allows demand across the rail network to be more evenly distributed, reducing localised congestion/constraints and increasing capacity. The introduction of this approach in ACAR23 was assessed as increasing DNC for FY24 by approximately 300 train paths (~3.0Mt).

In ACAR24, the IE has assessed the difference between the current approach and an alternative where all DBCT demand is treated as purely even-railings. With other parameters unchanged, this even-railings alternative increased DNC by 69 train paths (~0.7Mt). A further test was undertaken in which Inloader maintenance, minor maintenance and TLO maintenance was removed. In this less constrained scenario, even-railings provided an increase of 72 train paths (0.7Mt) over the current demand methodology.

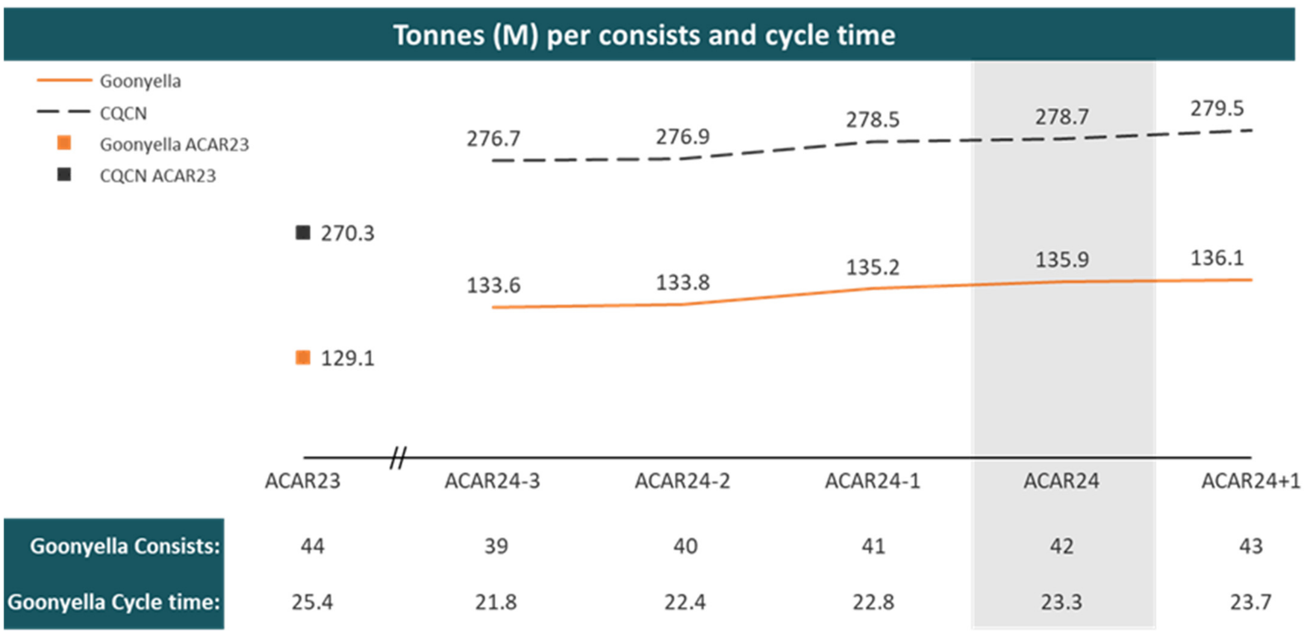
[redacted]

4.2.8 Above-rail Fleet Assumptions

During consultation on the draft SOP parameters, AN advised the IE that they considered that their previous advice of 18 holding locations within the Jilalan yard (which was adopted in ACAR23) was too optimistic and instead that 15 holding locations was a more practical reflection of assets and activities in that location. This revised assumption has been adopted in ACAR24.

Per normal modelling practice, the IE has optimised consist numbers within ACAR24, which adopts 42 consists for the Goonyella system, spread across the four operators – two consists fewer than ACAR23. This was determined as the optimal outcome considering the impact of consist numbers on Goonyella throughput and cycle time and on throughput in other CQCN systems.

Figure 15 - Goonyella Consist sensitivity



As discussed in **section 2.2.2,** above-rail operators are allocated to mines based on CY23 railings. The IE has undertaken a sensitivity of the impact of operator-specific above-rail allocation, by allowing all third-party operators to operate to all mines. In the Goonyella system, DNC increased by approximately 70 trains (~0.7Mt) under this scenario, suggesting some modest constraint within the base case due to operator-specific fleet allocation.

A further sensitivity was conducted by restricting above-rail assets to current consist numbers (34 consists). In the Goonyella system, this sensitivity resulted in a DNC of approximately 13,100 trains (~128.1Mt).

4.3 Cycle Times

As DNC is evaluated on a higher number of consists to support unconstrained demand, modelled cycle times may be higher than those required to deliver contractual demand.

The FY25 median modelled train cycle times for Goonyella of 23.3 hours has reduced by 8% (2.1 hours) compared to ACAR23 (25.4 hours). This is likely to have been driven by the reduction in consists described above.

Table 7 - Goonyella Cycle Time

Cycle Time (Hours)	FY24 (ACAR 2023)	FY25 (ACAR 2023)	FY25 (ACAR 2024)	FY25 Change
Goonyella	25.1	25.4	23.3	-8%

4.4 Committed Capacity

Committed capacity for FY25 has reduced from FY24 by 127 train paths, slightly more than anticipated in ACAR23 (a reduction of 101 train paths), due to a range of minor contractual changes.

4.5 DNC and Available Capacity/Existing Capacity Deficit

The reduction in committed capacity and an increase in DNC (+408 train paths over FY24) to 13,873 (135.9Mt) has eliminated the previous existing capacity deficit. These changes leave the Goonyella system with available capacity in FY25 of 232 train paths – equivalent to 2.3Mt at median expected payload.

Capacity outcomes for all years of the ACAR period is outlined below in **Figure 16** in Train Paths and **Figure 17** in Tonnes.

Figure 16 - Goonyella summary for FY25 to FY29 (Train Paths)

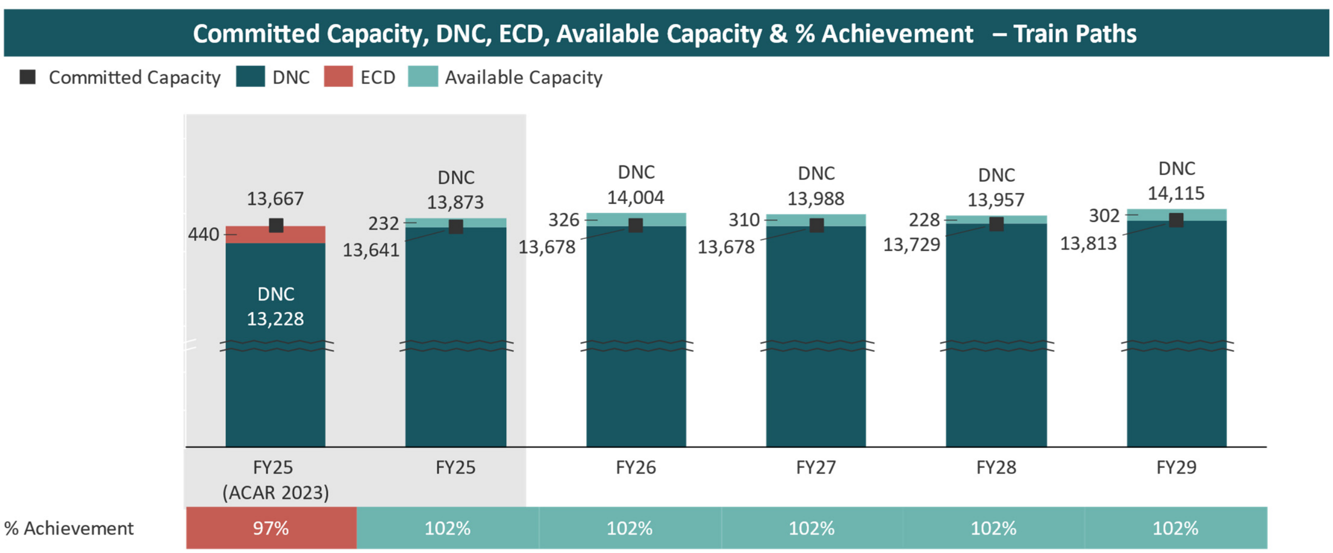
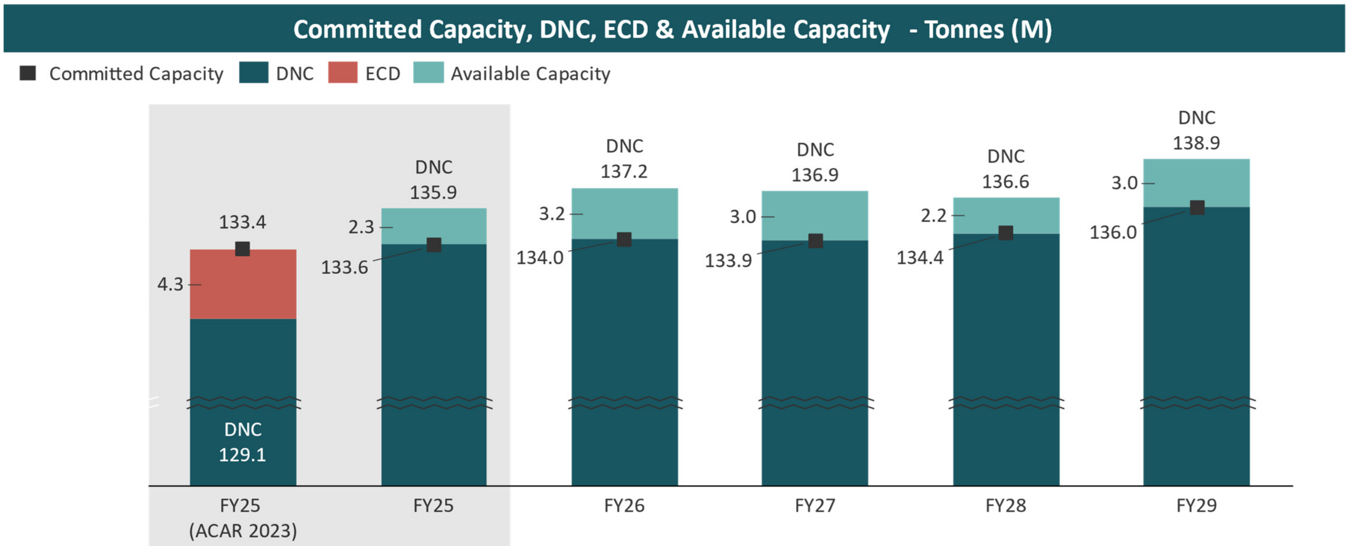


Figure 17 - Goonyella summary for FY25 to FY29 (Tonnes)



The DNC calculated for the Goonyella System by month for the five-year assessment period is shown in **APPENDIX C: Goonyella System Information**.

4.6 Capacity Variability

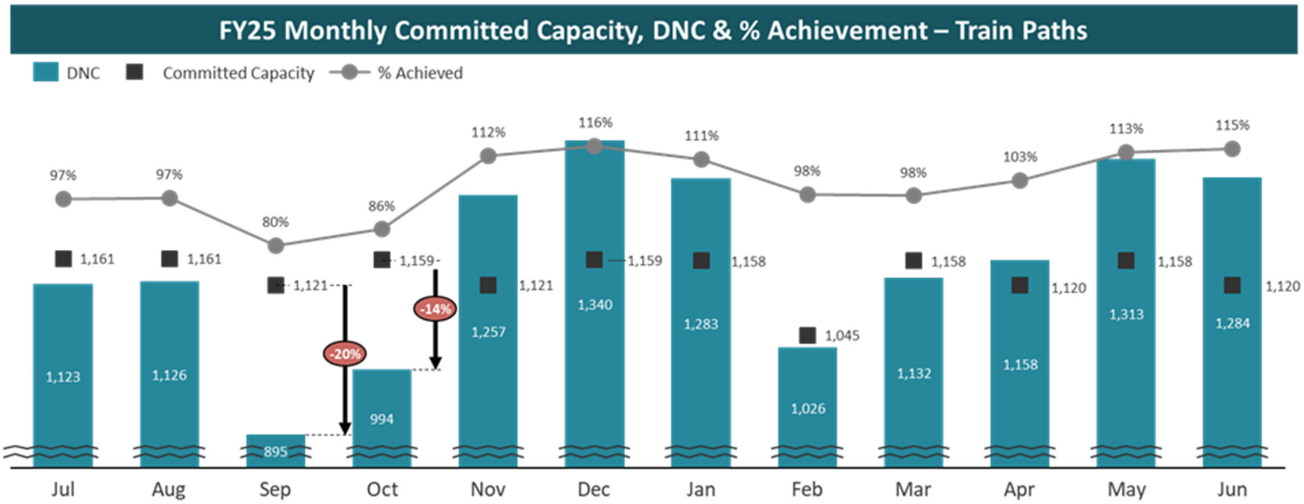
The ACAR24 Goonyella system DNC for FY25 of 13,873 train paths was determined from the median of 50 model simulation runs. The P90 to P10 range of the DNC was from 13,670 to 14,050 train paths as shown in **Table 8**. 10% of the model runs did not achieve committed capacity for FY25.

Table 8 - Goonyella DNC – model variability

Model seed variability - 50 seeds - FY25					
Probability	**P90**	**P75**	**Median**	**P25**	**P10**
DNC (Train Paths)	13,670	13,804	13,873	13,990	14,050
DNC (Tonnes M)	133.9	135.2	135.9	137.1	137.7
Variability to median	-1.5%	-0.5%		0.8%	1.3%
Committed Capacity	13,641				

Although DNC is most frequently discussed in annual terms, the IE is required to determine each system's capacity on a monthly basis. FY25 monthly capacity in the Goonyella system shows considerable variability, ranging from 895 to 1,340 train paths, representing a range from 20% below committed capacity to 16% above committed capacity, as shown in **Figure 18** below. (Monthly capacity for the full five-year period of the ACAR model is shown in **APPENDIX C: Goonyella System Information** largely aligned to planned maintenance events).

Figure 18 – Goonyella System FY25 Monthly Capacity



4.7 Capacity Constraints and Branch line Capacity

4.7.1 Mainline and Branch line DNC

The IE is required to determine DNC for each system's mainline and branch lines. In determining system DNC, the IE increases demand for each origin-destination pair in a system simultaneously until the maximum throughput is reached. The DNC, committed capacity and ECD values, where applicable, per mainline and branch line for Goonyella are outlined below in **Table 9** in train paths and tonnes.

Table 9 - Goonyella values per Mainline and Branch line for FY25 to FY29

System		Mainline / Branch Line	Committed Capacity					DNC					ECD				
			FY25	FY26	FY27	FY28	FY29	FY25	FY26	FY27	FY28	FY29	FY25	FY26	FY27	FY28	FY29
Train Paths																	
Goonyella	3	M.L. - Coppabella to Jilalan	13,641	13,678	13,678	13,729	13,813	13,873	14,004	13,988	13,957	14,115	-	-	-	-	-
	3A	B.L. - Jilalan to Port of Hay Point	13,641	13,678	13,678	13,729	13,813	13,873	14,004	13,988	13,957	14,115	-	-	-	-	-
	3B	B.L. - Hail Creek Mine to South Walker Creek Junction	[redacted]														
	3C	B.L. - Oaky Creek Junction to Coppabella	5,668	5,828	5,678	5,911	6,690	5,619	5,831	5,660	5,858	6,770	-	-	-	-	-
	3D	B.L. - Coppabella to Wotonga	6,248	6,121	6,259	6,076	5,291	6,449	6,370	6,522	6,295	5,409	-	-	-	-	-
	3E	B.L. - North Goonyella Mine to Wotonga	2,742	2,645	3,034	2,911	2,903	2,817	2,757	3,156	3,009	3,024	-	-	-	-	-
	3F	B.L. - Blair Athol Mine to Wotonga	2,685	2,744	[redacted]			2,779	2,859	[redacted]			-	-	[redacted]		
Tonnes (M)																	
Goonyella	3	M.L. - Coppabella to Jilalan	133.6	134.0	133.9	134.4	136.0	135.9	137.2	136.9	136.6	138.9	-	-	-	-	-
	3A	B.L. - Jilalan to Port of Hay Point	133.6	134.0	133.9	134.4	136.0	135.9	137.2	136.9	136.6	138.9	-	-	-	-	-
	3B	B.L. - Hail Creek Mine to South Walker Creek Junction	[redacted]														
	3C	B.L. - Oaky Creek Junction to Coppabella	55.5	57.1	55.6	57.8	65.9	55.0	57.1	55.4	57.3	66.6	-	-	-	-	-
	3D	B.L. - Coppabella to Wotonga	61.2	60.0	61.3	59.5	52.1	63.2	62.4	63.9	61.6	53.2	-	-	-	-	-
	3E	B.L. - North Goonyella Mine to Wotonga	26.9	25.9	29.7	28.5	28.6	27.6	27.0	30.9	29.4	29.8	-	-	-	-	-
	3F	B.L. - Blair Athol Mine to Wotonga	26.3	26.9	[redacted]			27.2	28.0	[redacted]			-	-	[redacted]		

Table 9 above represent coal traffic that has a destination of that system's Port Precinct. Some branch lines are used to transport coal to multiple systems as is the case, for example, where origins on some Goonyella branch lines have a Port Precinct destination in the GAPE or Blackwater systems. The capacity associated with those situations is not included in the table above.

4.7.2 Branch line Capacity and System Constraints

The allocation of system DNC to branch lines shown in **section 4.7.1** above does not, however, demonstrate the full potential capacity of each branch line in the Goonyella system.

In order to assess the full branch line capacity, the IE has undertaken a series of model sensitivities. To determine the branch line limits, the following methodology was used:

- For each branch line, demand was increased at the furthest TLO while reducing other branch lines, mine demand (proportionately) to ensure mainline demand remains constant (note only mines railing to DBCT were used to flex demand in this way). The applicable TLO was unconstrained or the additional demand was shared across multiple TLOs to ensure TLO-specific characteristics were not a constraint to branch line capacity.
- Demand was increased to the point where overall system throughput drops to total committed capacity level. This is akin to the test that would be applied for a successful new access or transfer request.
- Branch 3D, the Coppabella-Wotonga branch, presented a special case for this method given that branches 3E (North Goonyella) and 3F (Blair Athol) pass through it. For this case, branch demand on 3E and 3F was held constant and only branch 3D capacity increased, while capacity was reduced on 3C Gregory and 3B Hail Creek branches.

This analysis suggests all branch lines have additional capacity of between 25 to 265 trains per month except the North Goonyella branch which is the most constrained branch with 0 to 120 trains per month additional capacity.

Table 10 - Goonyella System FY25 Monthly Branch line Sensitivity

Branch Line Capacity in excess of Committed Capacity- FY25													
Line	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Total**
3A B.L. - Jilalan to Port of Hay Point	-15	-10	-240	-145	+120	+205	+145	-110	-5	+20	+175	+145	**+285**
3 M.L. - Coppabella to Jilalan	-15	-10	-240	-145	+120	+205	+145	-110	-5	+20	+175	+145	**+285**
3B B.L. - Hail Creek Mine to South Walker Creek Junction	+95	+85	+25	+90	+125	+125	+125	+85	+80	+105	+125	+125	**+1,190**
3C B.L. - Oaky Creek Junction to Coppabella	+155	+140	+30	+95	+220	+265	+230	+90	+165	+150	+210	+225	**+1,975**
3D B.L. - Coppabella to Wotonga	+95	+110	+70	+70	+110	+130	+120	+75	+85	+100	+115	+120	**+1,200**
3E B.L. - North Goonyella Mine to Wotonga	+55	+60	0	+30	+95	+120	+90	+30	+55	+70	+100	+100	**+805**
3F B.L. - Blair Athol Mine to Wotonga	+115	+120	+50	+65	+150	+170	+165	+85	+125	+120	+165	+160	**+1,490**

4.8 Risks to Capacity

ACAR24 represents a "point in time" assessment of network capacity, driven by the data observable at this time. Future network capacity will remain subject to variation through any one or more of the model inputs included in ACAR24.

Of particular note is track maintenance activities. As discussed in **section 4.2.3**, Goonyella system network capacity is particularly sensitive to AN's maintenance activities. Major maintenance as well as minor maintenance activities have seen increases in possession hours in recent years.

Although too late for consideration in ACAR24, the initial information regarding FY26 Goonyella system integrated closures provided by AN in June 2024 does suggest a discernible trend of a steady increase in this important component of track maintenance. This increases the possibility that future ACAR assessments may need to adopt an assumption of increasing annual maintenance possessions, with the potential for reductions in capacity over time, perhaps even to the point of re-introducing a capacity deficit.

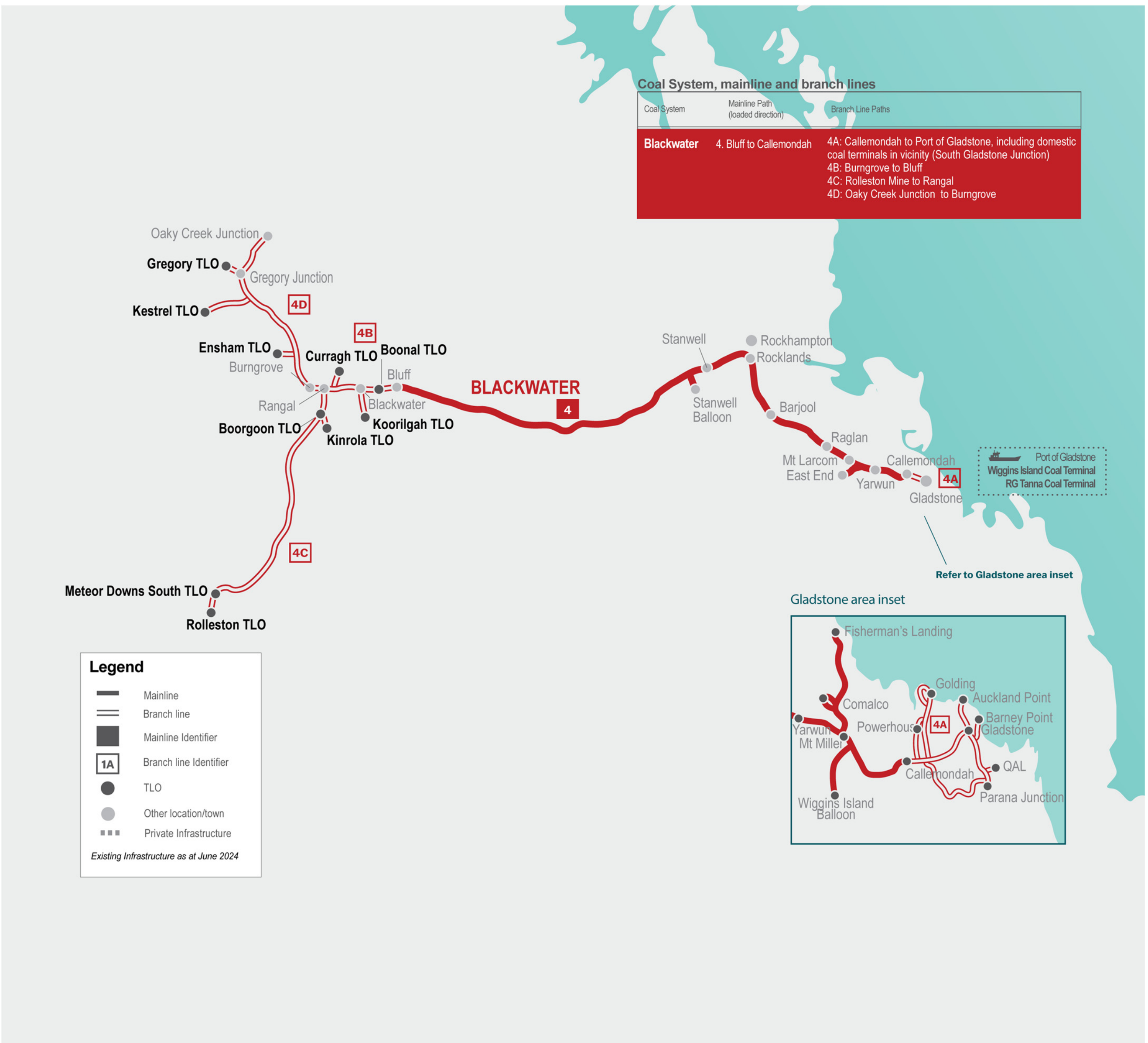
5. Blackwater System

5.1 Overview of System

A map of the Blackwater System is provided in **Figure 19**. It shows the coal system and each mainline and branch line that makes up the Blackwater System. The system includes the rail infrastructure comprising the rail corridor from terminals at Wiggins Island Coal Export Terminal and RG Tanna Coal Terminal to Rolleston mine, Burngrove and Oaky Creek Junction and all branch lines directly connecting coal mine loading facilities to those corridors. Blackwater System also has a number of domestic coal users that are considered.

Some of the Moura System traffic utilises the Blackwater system branch from Callemondah to Port of Gladstone, encompassing RG Tanna and the Gladstone Power Station creating a strong inter-relationship between these two systems.

Figure 19 - Blackwater System



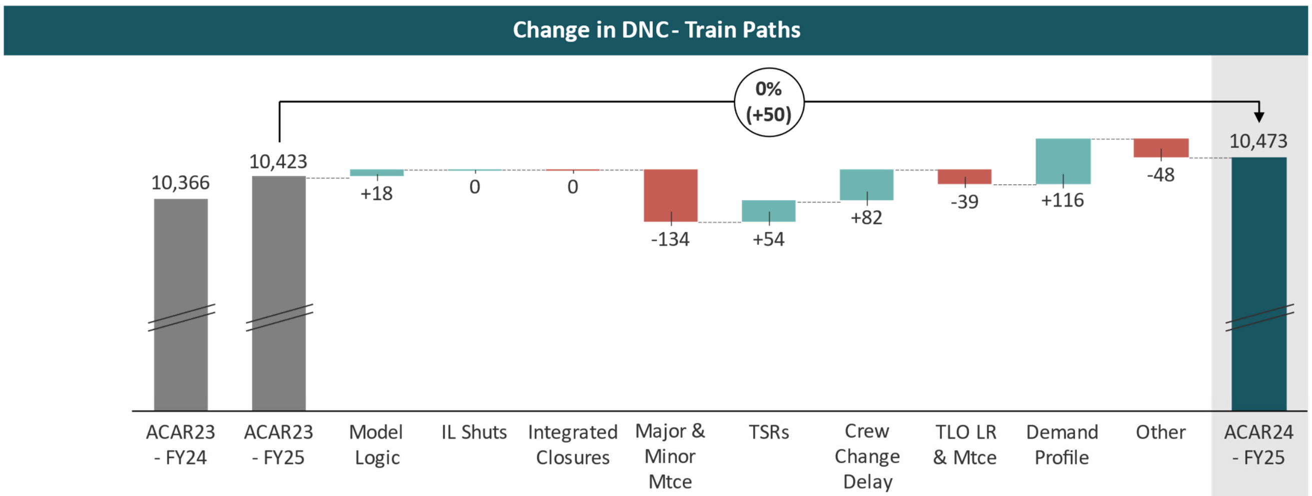
5.2 Deliverable Network Capacity

5.2.1 Summary

The Blackwater system FY25 DNC has seen a minor increase to 10,473 train paths (+0.5%) compared with ACAR23. This represents an increase of 107 train paths (+1.0%) over FY24. When combined with a small increase in median payload, capacity in tonnage terms has increased +1.9% over FY24 to 85.3Mt.

There were several changes to the Model that resulted in changes in capacity for the Blackwater system, but most were modest in magnitude. The changes to FY25 capacity are shown in **Figure 20** below:

Figure 20 - Blackwater changes from ACAR23 to ACAR24 – FY25



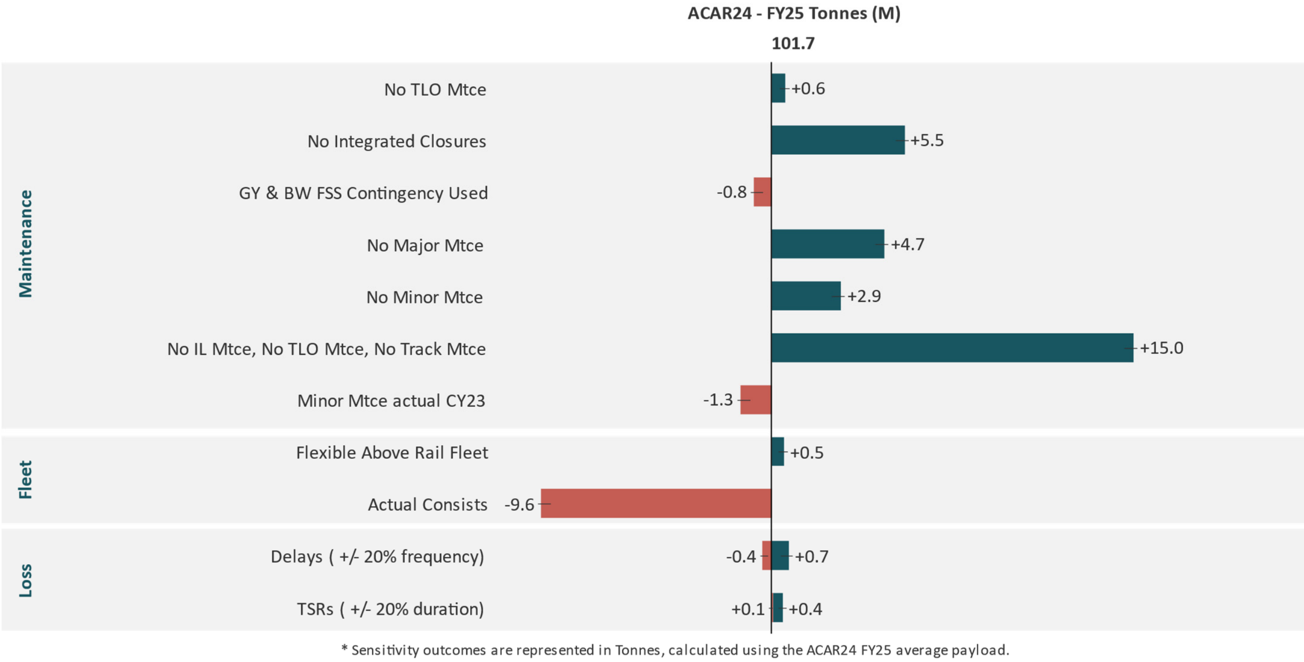
Tonnes (M) *	84.5	84.9	0.1	0.0	0.0	-1.1	0.4	0.7	-0.3	0.9	-0.4	85.3

* Tonnes are calculated using the ACAR24 FY25 average payload.

It should be noted that because they share a rail dispatch depot (Callemondah), a primary export terminal (RG Tanna Coal Terminal (“RGTCT”)) and a domestic customer (Gladstone Power Station), the capacities of the Blackwater system and the Moura system are closely linked, and to some extent inversely related (i.e. releasing constraints on the Blackwater system can reduce Moura system throughput and vice-versa).

An assessment has also been performed of the impact on the combined Blackwater and Moura systems’ DNC of changes to key operating parameters, these are represented in Tonnes in **Figure 21** below.

Figure 21 – Blackwater & Moura sensitivity impact to DNC of key operating parameters – FY25



5.2.2 Terminal and Track Maintenance

Terminal Maintenance

Based on the advice of terminal operators, there is not expected to be any planned Inloader maintenance outside rail network shuts in FY25.

Note: A review of CY23 data on the unloading rate and unplanned delays of the inloaders at RGTCT or WICET did not show evidence of any significant change since ACAR23, with the notable exception of a significant equipment failure at WICET in December 2023 (which has been discussed in more detail at Blackwater industry forums). Given the exceptional nature of this incident, it was excluded from the data review, and based on that review, no changes were made to the underlying unloading rate and unplanned delay parameters in the model.

Track Maintenance

As discussed in **section 2.2.1**, the Model directly incorporates AN's planned major maintenance programs, including integrated closures, consistent with the approved MRSB scope.

As outlined in AN's MRSB documentation, integrated closure possession hours in the Blackwater system will be 435 hours in FY25 - 3% lower than in FY24 (excluding the 60-hour April 2025 contingency closure), although the branch line closure is slightly longer. Overall, changes to integrated closure possessions for FY25 have no discernible capacity impact. In aggregate, integrated closures in FY25 have been assessed as reducing combined Blackwater/Moura system DNC by approximately 700 train paths (~5.5Mt).

ACAR24 also includes AN's planned major maintenance activities outside integrated closures and, as discussed in **section 2.2.1**, the IE has revised the estimate of future minor maintenance activities based on a review of maintenance activities from CY20 to CY23.

These major and minor track maintenance activities have reduced capacity by approximately 130 train paths (~1.1Mt) compared with ACAR 23. In aggregate, major and minor maintenance outside integrated closures in FY25 has been assessed as reducing Blackwater/Moura system DNC by approximately 930 train paths (~7.6Mt).

If, however, minor maintenance were to occur consistent with the levels of maintenance observed in CY2023 (rather than based on CY20 – CY23), it would reduce the Blackwater FY25 DNC by a further ~160 train paths (~1.3Mt).

5.2.3 TLO Maintenance

When one or more TLOs in a system is closed for maintenance, this can concentrate train movements to those TLOs remaining open. The concentration can cause localized congestion and, in turn, reduce capacity.

The IE has examined TLOs closures in CY23 and prior years, to try to determine a "normal" level of TLO closures in the CQCN. Data regarding closures is collected by AN planning systems and has been provided to the IE. This data has been reviewed to determine when TLOs were closed for maintenance activity. Closure periods that overlapped with full system shutdowns or applicable branch line shutdowns were excluded, as were closures recorded against TLOs with no contractual capacity or where the applicable mine was shut.

In the Blackwater system, approximately 1,400 hours of TLO shutdown were recorded. Approximately half of this amount related to extended shutdowns at one TLO, with the remainder comprised of short-duration routine maintenance activities.

As the IE has no clear forecast of expected TLO maintenance in FY25, FY25 TLO maintenance has been based on CY23 maintenance levels (as modified in the analysis described above).

In aggregate, TLO maintenance in the Blackwater and Moura system reduced DNC by approximately 75 train paths (~0.6Mt).

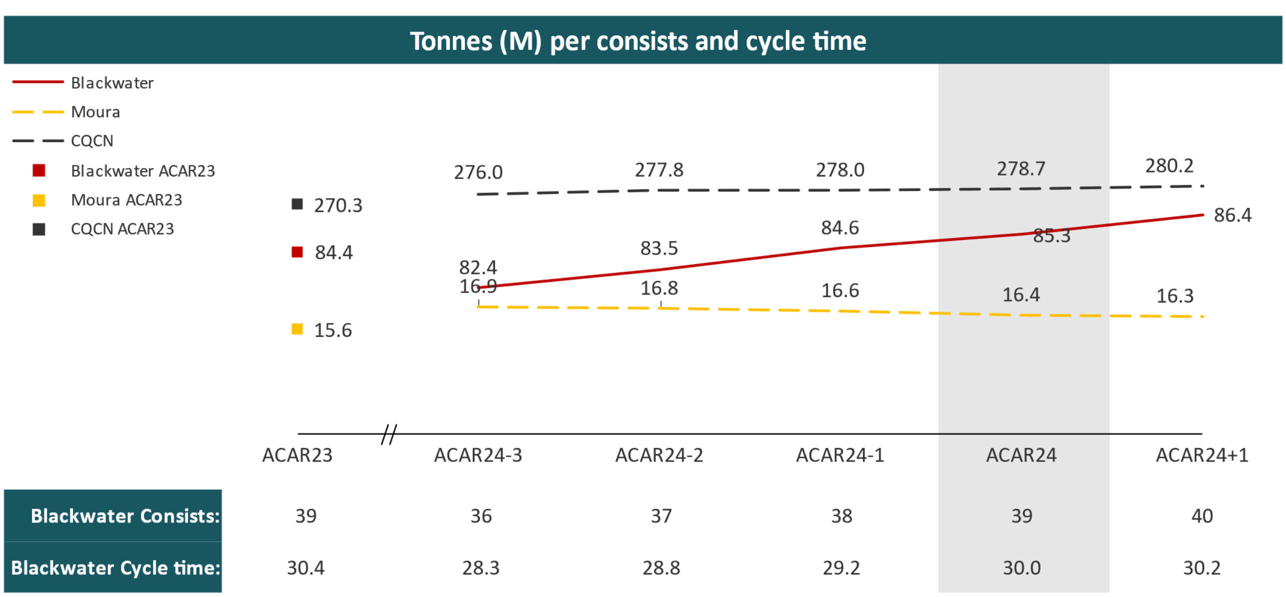
5.2.4 Demand Presentation

As discussed in the ACAR23 report released in June 2023, the IE models terminals in the Blackwater system as even-railings and distributes each mine's contractual demand evenly across each month.

5.2.5 Above-rail Fleet Assumptions

As in all capacity assessments, the IE has optimised Blackwater consist numbers within ACAR24. ACAR24 adopts 39 consists for the Blackwater system, as was the case in ACAR23. This was determined as the optimal outcome considering the impact of consist numbers on Blackwater throughput and cycle time and on throughput in other CQCN systems. Particular attention was paid to throughput in the Moura system as Blackwater and Moura model results are highly (but inversely) correlated, given their common use of the Callemondah yard and RGTCT terminal.

Figure 22 - Blackwater Consist sensitivity



As discussed in **section 2.2.2**, above-rail operators are allocated to mines based on CY23 railings. The IE has undertaken a sensitivity of the impact of above-rail allocation, by allowing all third-party operators to operate to all mines. In the Blackwater and Moura systems, DNC increased by approximately 70 trains (~0.5Mt) under this scenario, suggesting some minor constraint within the base case due to above-rail fleet allocation.

A further sensitivity was conducted by restricting above-rail assets to current consist numbers. In the combined Blackwater/Moura systems, this sensitivity resulted in a capacity of approximately 11,660 trains (~92.2Mt), a reduction of almost 10Mt from the combined DNC.

5.3 Committed Capacity

Blackwater system committed capacity for FY25 has reduced from FY24 by 234 train paths, more than anticipated in ACAR23, due primarily to a partial capacity renewal.

5.4 Cycle Times

As DNC is evaluated on a higher number of consists to support unconstrained demand, modelled cycle times may be higher than those required to deliver contractual demand.

The FY25 median modelled train cycle time for Blackwater of 30 hours has reduced very marginally – down 0.4 hours (-1%) compared to ACAR23.

Table 11 - Blackwater Cycle Time

Cycle Time (Hours)	FY24 (ACAR 2023)	FY25 (ACAR 2023)	FY25 (ACAR 2024)	FY25 Change
Blackwater	30.6	30.4	30.0	-1%

5.5 DNC and Available Capacity/Existing Capacity Deficit

The combination of changes to both the DNC and committed capacity for the Blackwater system leaves the Blackwater system with **Available Capacity** of 786 train paths in FY25 – equivalent to 6.4Mt at median expected payload.

Capacity outcomes for all years of the ACAR period is outlined below in **Figure 23** in Train paths and **Figure 24** in Tonnes.

Figure 23 - Blackwater summary for FY25 to FY29 (Train Paths)

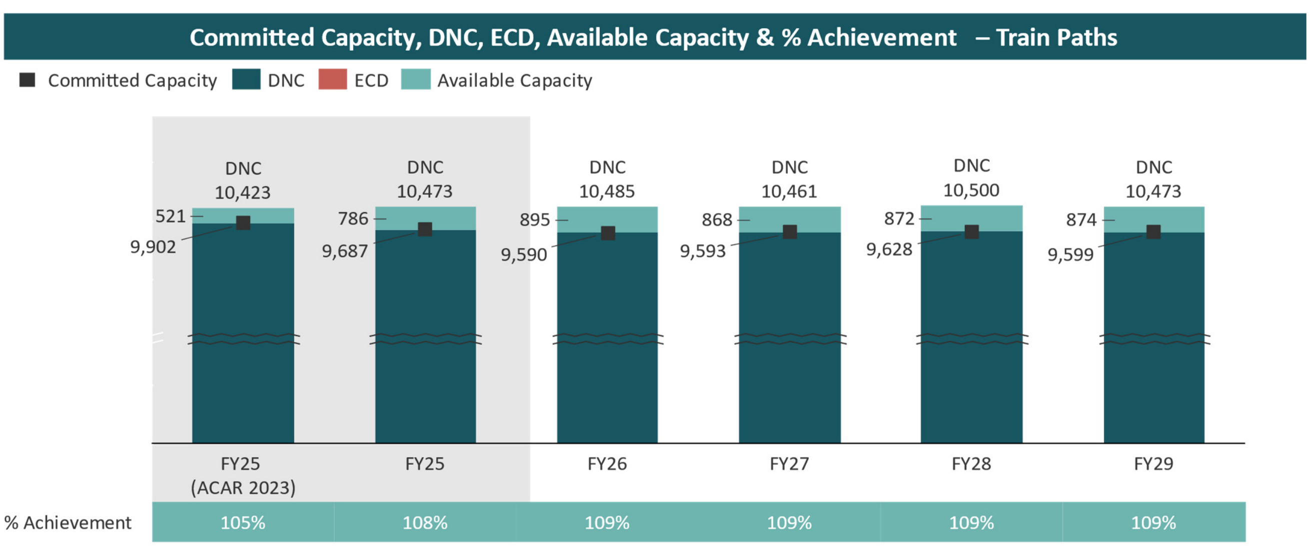
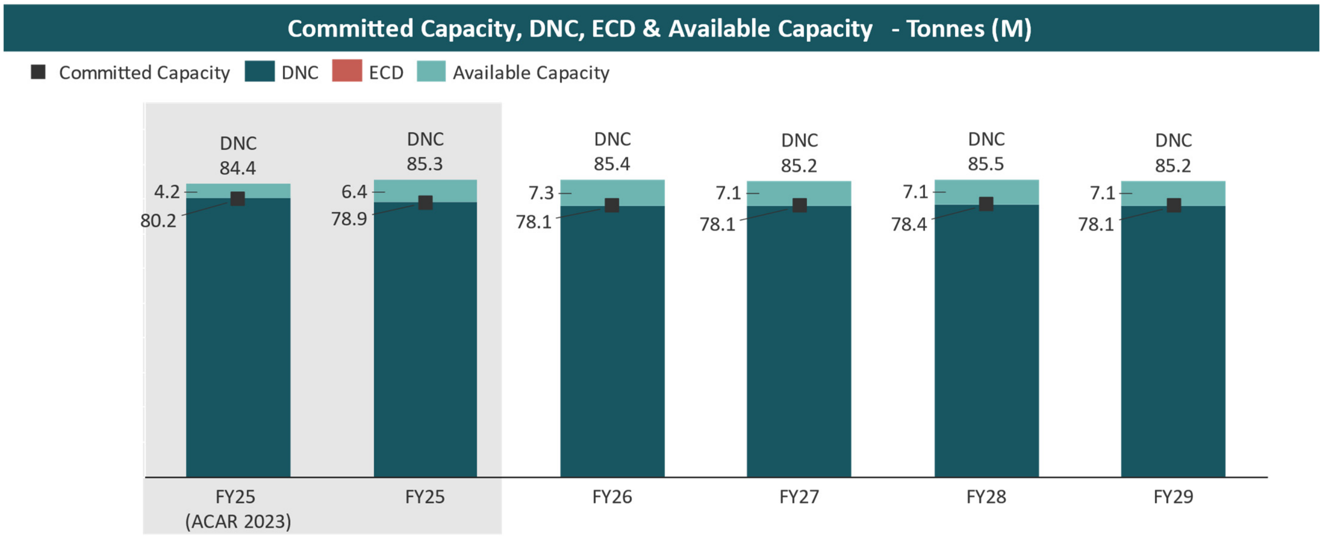


Figure 24 - Blackwater summary for FY25 to FY29 (Tonnes)



The DNC calculated for the Blackwater System by month for the five-year assessment period is shown in **APPENDIX D: Blackwater System Information**.

5.6 Capacity Variability

The ACAR24 Blackwater system DNC for FY25 of 10,473 train paths was determined from the median of 50 model simulation runs. The P90 to P10 range of the DNC was from 10,369 to 10,575 train paths, a variability of 1.9%, as shown in **Table 12**.

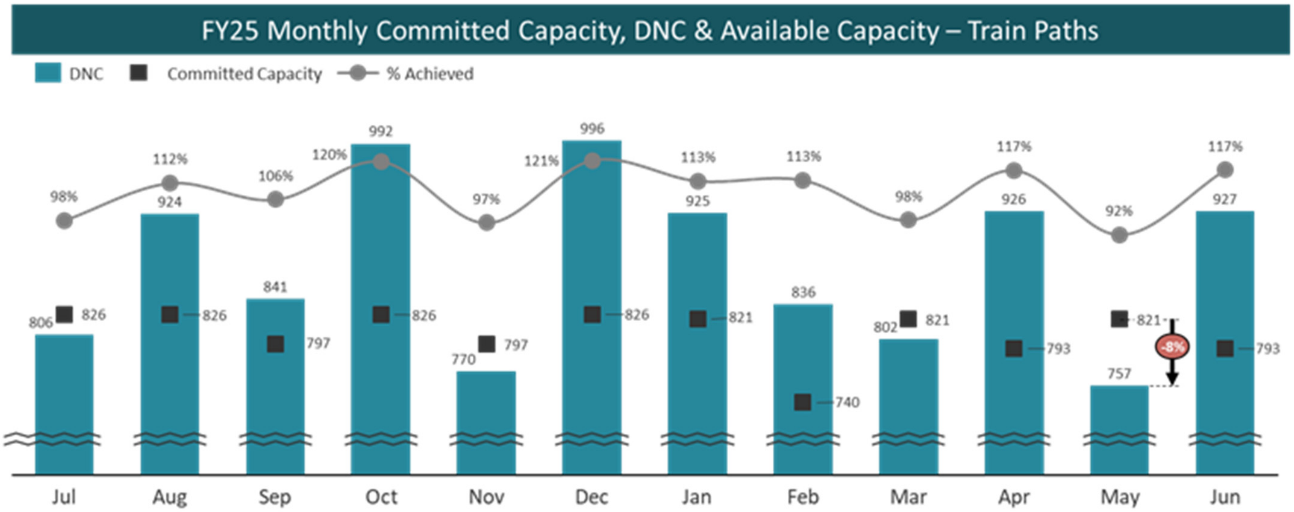
All of the model runs achieved committed capacity for FY25.

Table 12 - FY25 Blackwater DNC – model variability

Model seed variability - 50 seeds - FY25					
Probability	**P90**	**P75**	**Median**	**P25**	**P10**
DNC (Train Paths)	10,369	10,429	10,473	10,533	10,575
DNC (Tonnes M)	84.5	85.0	85.3	85.8	86.2
Variability to median	-1.0%	-0.5%		0.5%	0.9%
Committed Capacity	9,687				

Although DNC is most frequently discussed in annual terms, the IE is required to determine each system's capacity on a monthly basis. FY25 monthly capacity in the Blackwater system shows considerable variability, ranging from 757 to 996 train paths, representing a range from 8% below committed capacity to 21% above committed capacity, as shown in **Figure 25** below. This primarily reflects the impacts of maintenance shutdowns.

Figure 25 – Blackwater System FY25 Monthly Capacity



5.7 Capacity Constraints and Branch line Capacity

5.7.1 Mainline and Branch line Allocation of System DNC

The IE is required to determine DNC for each system's mainline and branch lines. In determining system DNC, the IE increases demand for each origin-destination pair in a system simultaneously until the maximum throughput is reached. The DNC, committed capacity and ECD values, where applicable, per mainline and branch line for Blackwater are outlined below in **Table 13** in train paths and tonnes.

The DNC values below reflect the proportion of current committed capacity in each branch line.

Table 13 - Blackwater values per Mainline and Branch line for FY25 to FY29

System	Mainline / Branch Line	Committed Capacity					DNC					ECD				
		FY25	FY26	FY27	FY28	FY29	FY25	FY26	FY27	FY28	FY29	FY25	FY26	FY27	FY28	FY29
Train Paths																
Blackwater	4 M.L. - Bluff to Callemondah	9,687	9,590	9,593	9,628	9,599	10,473	10,485	10,461	10,500	10,473	-	-	-	-	-
	4A B.L. - Callemondah to Port of Gladstone	9,322	9,225	9,228	9,274	9,246	9,965	9,977	9,953	10,003	9,977	-	-	-	-	-
	4B B.L. - Burngrove to Bluff	9,687	9,590	9,593	9,628	9,599	10,473	10,485	10,461	10,500	10,473	-	-	-	-	-
	4C B.L. - Rolleston Mine to Rangal	4,106	4,105	4,105	4,118	4,105	4,445	4,482	4,473	4,485	4,477	-	-	-	-	-
	4D B.L. - Oaky Creek Junction to Burngrove	2,916	2,820	2,823	2,850	2,841	3,105	3,051	3,041	3,069	3,057	-	-	-	-	-
Tonnes (M)																
Blackwater	4 M.L. - Bluff to Callemondah	78.9	78.1	78.1	78.4	78.1	85.3	85.4	85.2	85.5	85.2	-	-	-	-	-
	4A B.L. - Callemondah to Port of Gladstone	76.0	75.1	75.2	75.6	75.3	81.2	81.2	81.1	81.5	81.2	-	-	-	-	-
	4B B.L. - Burngrove to Bluff	78.9	78.1	78.1	78.4	78.1	85.3	85.4	85.2	85.5	85.2	-	-	-	-	-
	4C B.L. - Rolleston Mine to Rangal	33.5	33.4	33.4	33.5	33.4	36.2	36.5	36.4	36.5	36.4	-	-	-	-	-
	4D B.L. - Oaky Creek Junction to Burngrove	23.8	23.0	23.0	23.2	23.1	25.3	24.8	24.8	25.0	24.9	-	-	-	-	-

Table 13 above represents coal traffic that has a destination of that system's Port Precinct. Some branch lines are used to transport coal to multiple systems as is the case, for example, where origins on some Goonyella branch lines have a Port Precinct destination in the GAPE or Blackwater systems. The capacity associated with those situations is not included in the table above.

5.7.2 Branch line Capacity and System Constraints

The allocation of system DNC to branch lines shown in **section 5.7.1** above does not, however, demonstrate the full potential capacity of each branch line in the Blackwater system.

In order to assess the full branch line capacity, the IE has undertaken a series of model sensitivities. To determine the branch line limits in the Blackwater system, the following methodology was used:

- For branch lines 4C and 4D, demand was increased at the furthest TLO while reducing other branch lines' mine demand (proportionately) to ensure mainline demand remains constant (note only mines railing to RGTCT were used to flex demand in this way). The applicable TLO was unconstrained or the additional demand was shared across multiple TLOs to ensure TLO-specific characteristics were not a constraint to branch line capacity.
- Demand was increased to the point where overall system throughput drops to total committed capacity level. This is akin to the test that would be applied for a successful new access or transfer request.
- Branch 4B, the Burngrove to Bluff branch, presented a special case for this method given that branches 4C (Rolleston Branch) and 4D (Gregory Branch) pass through it. For this case, RGTCT branch demand on 4C and 4D was held constant and branch 4B capacity was increased until no additional throughput could be achieved. (This is necessary because there is no other branch line from which capacity can be moved).

This analysis suggests that both branch lines 4C and 4D have additional capacity of 55-190 and 95-225 trains per month respectively in excess of committed capacity. Branch 4B has additional capacity of 35-330 trains per month. All branch lines' excess capacity closely reflects the monthly major maintenance profile.

The most significant outcome of the sensitivity analysis was confirmation that Branch 4A, Callemondah to Port of Gladstone, is the most significant constraint in the Blackwater system. While this branch does have capacity in excess of committed capacity (as shown in **Table 14** below), this capacity is only marginally higher than the DNC for the system – indicating that this branch is the constraint on the system.

The Blackwater mainline however, has significant additional capacity. This was evident in a separate sensitivity analysis using branch 4B, which placed additional demand into the WICET terminal which sits close to the eastern end of the mainline. This constraint analysis showed that additional demand of up to 330 trains per month (200-220 on average) could be accommodated to WICET (but importantly, not to RGTCT). The IE considers that this conclusion appears broadly consistent with the investment in mainline infrastructure made as part of the Wiggins Island Rail Project (WIRP) project in 2015.

Table 14 - Blackwater System Branch line Sensitivity per month (Capacity in excess of committed capacity)

Branch Line Capacity in excess of Committed Capacity - FY25													
Line	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Total**
4A B.L. - Callemondah to Port of Gladstone	+25	+135	+20	+185	-20	+180	+90	+95	+25	+160	-45	+140	**+985**
4 M.L. - Bluff to Callemondah	+110	+305	+165	+305	+100	+305	+275	+260	+85	+330	+35	+320	**+2,600**
4B B.L. - Burngrove to Bluff	+110	+305	+165	+305	+100	+305	+275	+260	+85	+330	+35	+320	**+2,595**
4C B.L. - Rollestone Mine to Rangal	+85	+150	+110	+190	+70	+180	+145	+130	+70	+160	+55	+160	**+1,505**
4D B.L. - Oaky Creek Junction to Burngrove	+140	+180	+160	+215	+115	+225	+200	+175	+130	+210	+95	+205	**+2,050**

5.8 Risks to Capacity

ACAR24 represents a "point in time" assessment of network capacity, driven by the data observable at this time. Future network capacity will remain subject to variation through any one or more of the model inputs included in ACAR24.

Of particular note for the Blackwater system is track maintenance activities. As discussed in **section 5.2.3**, network capacity is particularly sensitive to AN's maintenance activities. Both major maintenance and minor maintenance activities have seen increases in possession hours in recent years.

Although too late for consideration in ACAR24, the initial information regarding FY26 Blackwater system integrated closures provided by AN on in June 2024 does support a discernible trend of a steady increase in this important component of track maintenance over the last five plus years. This increases the possibility that future ACAR assessments may need to adopt an assumption of increasing annual maintenance possessions, with the potential result of reductions in capacity, although given the magnitude of the available capacity in the Blackwater system, this is unlikely to see the system return to an ECD.

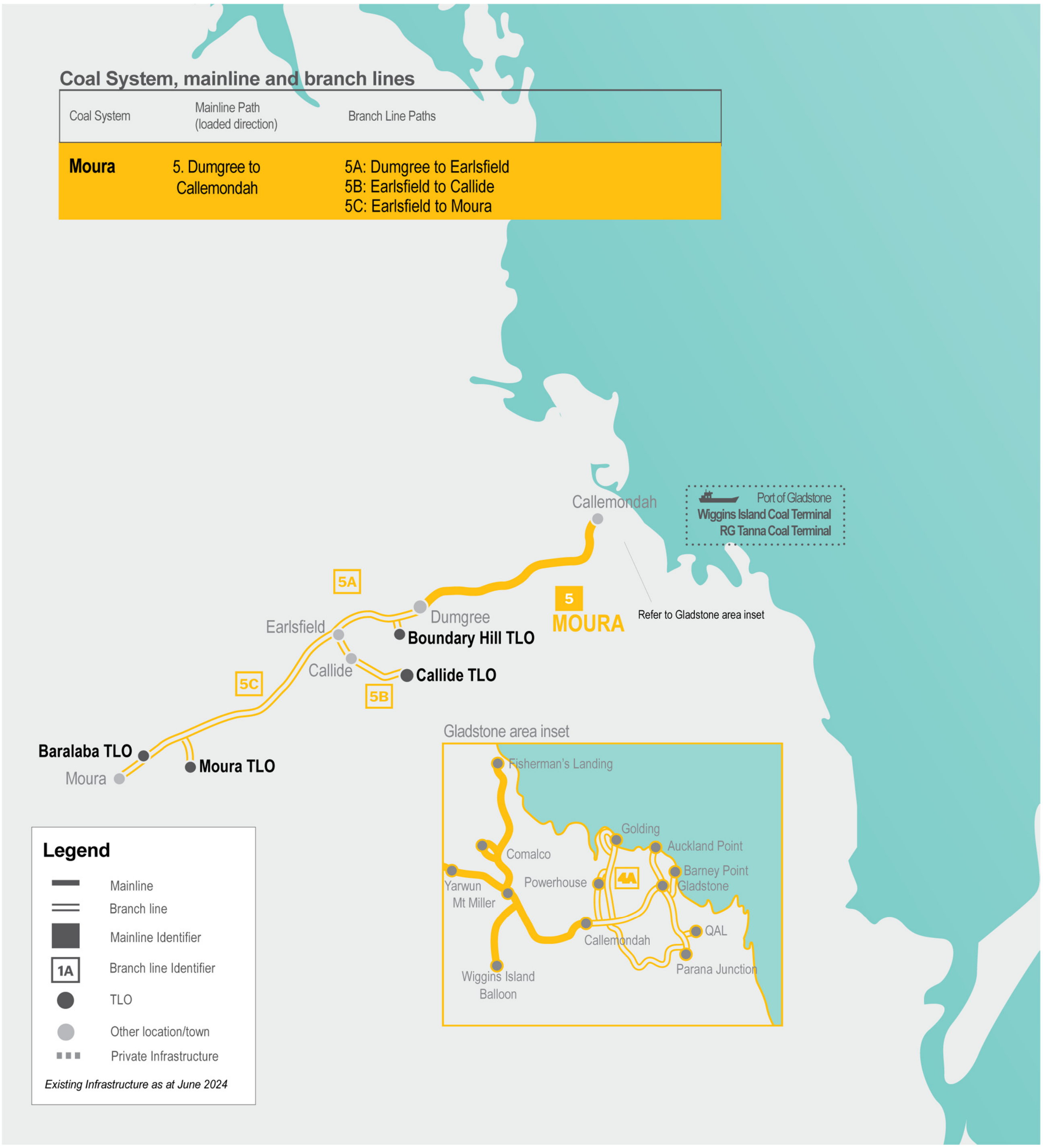
In addition to track maintenance, the branch line capacity re-confirmed the ICAR conclusion that the most significant constraint in the Blackwater system was the Callemondah precinct (incorporating the Callemondah rail yard, Gladstone Power Station and the approach to RGTCT). This is anecdotally evident in industry observations regarding congestion at Callemondah. Simulation modelling of rail yards is a complex matter and until some recent AN initiatives, data regarding activities within the yards was unavailable. As a result, it is possible that the Model is not accurately reflecting the capacity constraints within Callemondah. During FY25, the IE will examine the issue of yard congestion in more detail. It remains possible that the assessment of capacity within Callemondah and, given it is the constraint in the Blackwater system, Blackwater DNC may change.

6. Moura System

6.1 Overview of System

Figure 26 shows the system and each mainline and branch line that makes up the Moura system. The system includes the rail infrastructure comprising the rail corridor from the RG Tanna Coal Terminal and domestic coal user sites to Moura and Callide and all spur lines directly connecting coal mine loading facilities to those corridors. Moura system traffic also utilises branch line 4A (Callemondah to Port of Gladstone) of the Blackwater system.

Figure 26 - Moura System



6.2 Deliverable Network Capacity

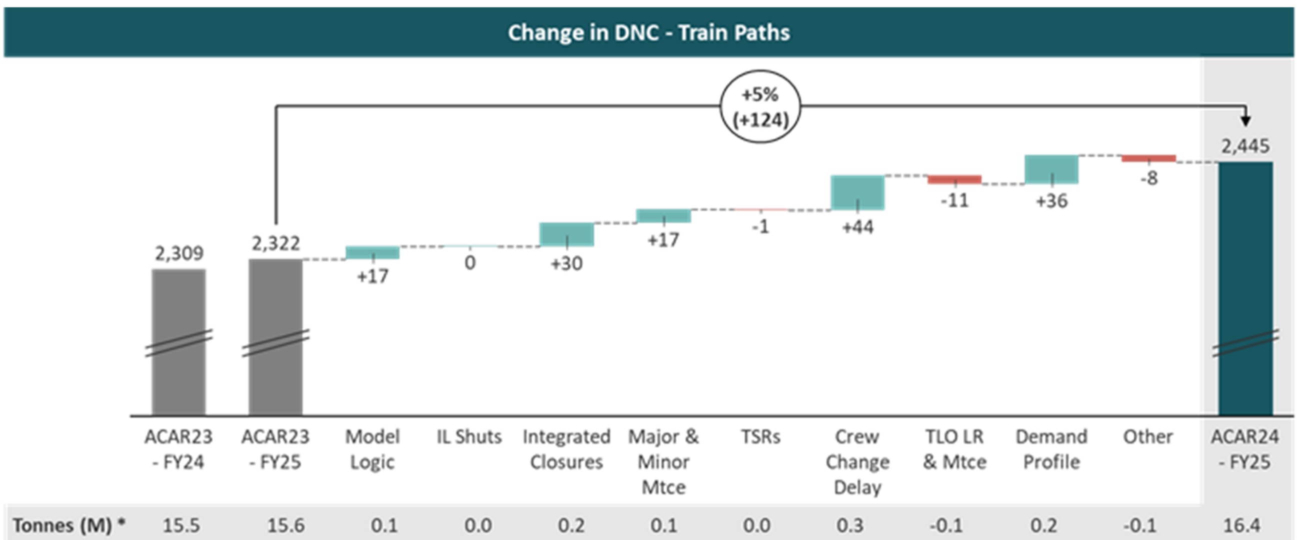
6.2.1 Summary

There have been few changes to the modelling of the Moura system for ACAR24.

FY25 DNC for Moura has increased marginally at 2,445 train paths - 124 (+5%) train paths more than ACAR24. Median payload has reduced by less than 1%, so capacity in tonnage terms increases to 16.4Mt in FY25.

Although none are particularly material, the indicative magnitude of the various changes to FY25 capacity are shown in **Figure 27** below:

Figure 27 - Moura indicative changes from ACAR23 to ACAR24 – FY25



* Tonnes are calculated using the ACAR24 FY25 average payload.

An assessment has also been performed of the impact on the combined Blackwater and Moura systems' DNC of changes to key operating parameters, these are represented in Tonnes in **Figure 21** at **section 5.2.1** of the Blackwater system section of this report.

6.2.2 Changes to Model Logic

Changes have been made to the model logic to ensure that trains are not dispatched to TLOs or branch lines that are undergoing maintenance, however this had minimal impact on the Moura system.

6.2.3 Terminal and Track Maintenance

Terminal Maintenance

Consistent with the Blackwater commentary, based on the advice of terminal operators, there is not expected to be any planned Inloader maintenance outside rail network shuts in FY25.

As described in the Blackwater system section of this report, no changes have been made to Inloader rates or delay assumptions.

Track maintenance

As discussed in **section 2.2.1**, the Model directly incorporates AN's planned major maintenance programs, including integrated closures, consistent with the approved MRSB scope. As outlined in AN's FY25 MRSB documentation, integrated closure possessions solely in the Moura system will be 168 hours. It is common for one Blackwater shutdown in the Callemondah and port precinct to substantially affect the Moura system each year. In FY25, the relevant Blackwater shut will be 60 hours long – an increase from the previous 36 hours. For FY24 however, AN's MRSB included a 78 hour wet weather contingency shutdown in September 2023, which CNCC had incorporated in all years of ACAR23, but this no longer features in the MRSB possessions and has been removed from the Model.

When all these changes to closures are included in the model, Moura system full shut hours will be 10% lower for FY25 than assumed in ACAR23. These changes result in an increase to capacity of 30 train paths (0.2Mt).

In aggregate, integrated closures in FY25 have been assessed as reducing combined Blackwater/Moura system DNC by approximately 700 train paths (~5.5Mt).

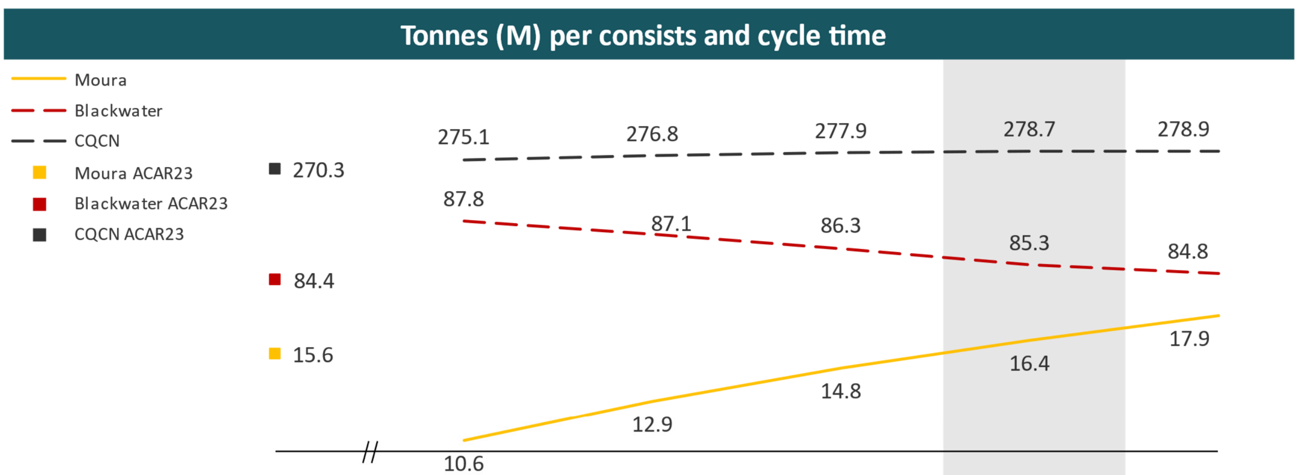
ACAR24 also includes AN's planned major maintenance activities outside integrated closures and, as discussed in **section 2.2.1**, the IE has revised the estimate of future minor maintenance activities based on a review of maintenance activities from CY20 to CY23, however in the Moura system there was no significant change observed in minor maintenance.

Track maintenance activities (predominantly major maintenance) have reduced capacity in the Moura system by approximately 20 train paths (~0.1Mt) compared with ACAR 23.

6.2.4 Above-rail Fleet Assumptions

As with other systems, the IE has optimised Moura consist numbers within ACAR24. ACAR24 adopts seven consists for the Moura system – there has been no change in consists since ACAR23. This was determined as the optimal outcome considering the impact of consist numbers on Moura throughput and cycle time and on throughput in other CQCN systems – primarily the Blackwater system given the close linkages between these two systems.

Figure 28 - Moura Consist sensitivity



	ACAR23	ACAR24-3	ACAR24-2	ACAR24-1	ACAR24	ACAR24+1
Moura Consists:	7	4	5	6	7	8
Moura Cycle time:	22.7	18.2	19.0	19.9	21.2	22.3

6.3 Committed Capacity

Committed capacity in the Moura system has increased by 12 train paths since ACAR23 to 2,340 train paths or 15.7Mt at median expected payload in FY25.

6.4 Cycle Times

As DNC is evaluated on a higher number of consists to support unconstrained demand, modelled cycle times may be higher than those required to deliver contractual demand.

The FY25 median modelled train cycle time for the Moura system of 21.2 hours has reduced by 1.5 hours since ACAR23 and represents a -8% reduction over ACAR23 FY24 cycle time.

Table 15 - Moura Cycle Time

Cycle Time (Hours)	FY24 (ACAR 2023)	FY25 (ACAR 2023)	FY25 (ACAR 2024)	FY25 Change
Moura	23.0	22.7	21.2	-7%

6.5 DNC and Available Capacity/Existing Capacity Deficit

Given the increase in DNC and very minor change to committed capacity for the Moura system, the Moura system has no existing capacity deficit in any of the five years of the ACAR period.

Capacity outcomes for all years of the ACAR period is outlined below in **Figure 29** in Train paths and **Figure 30** in tonnes.

Figure 29 - Moura summary for FY25 to FY29 (Train Paths)

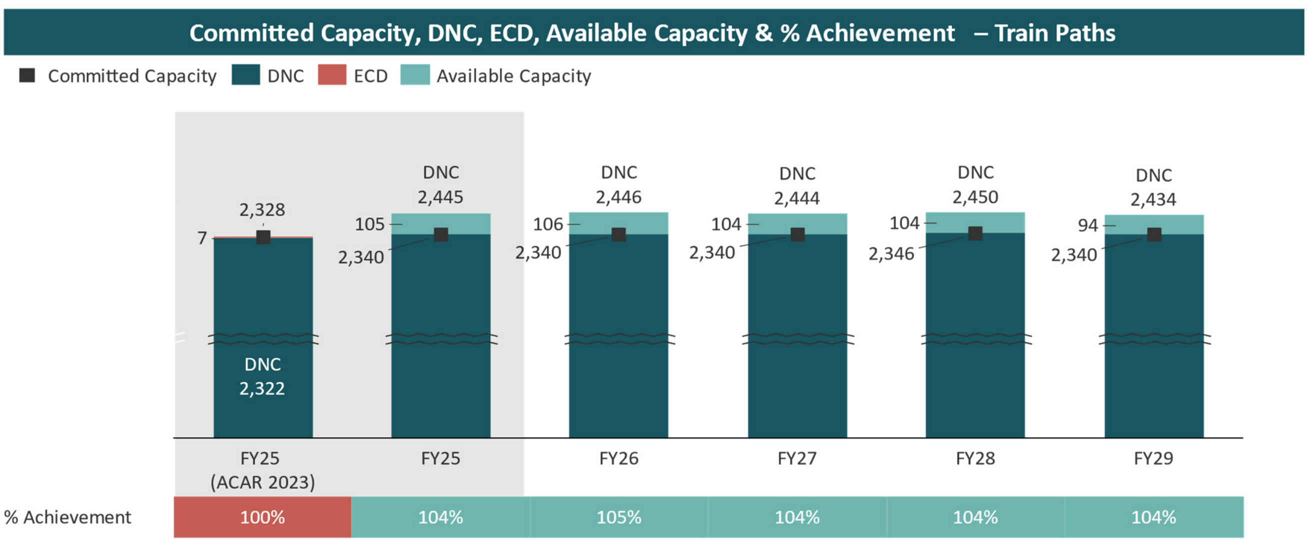
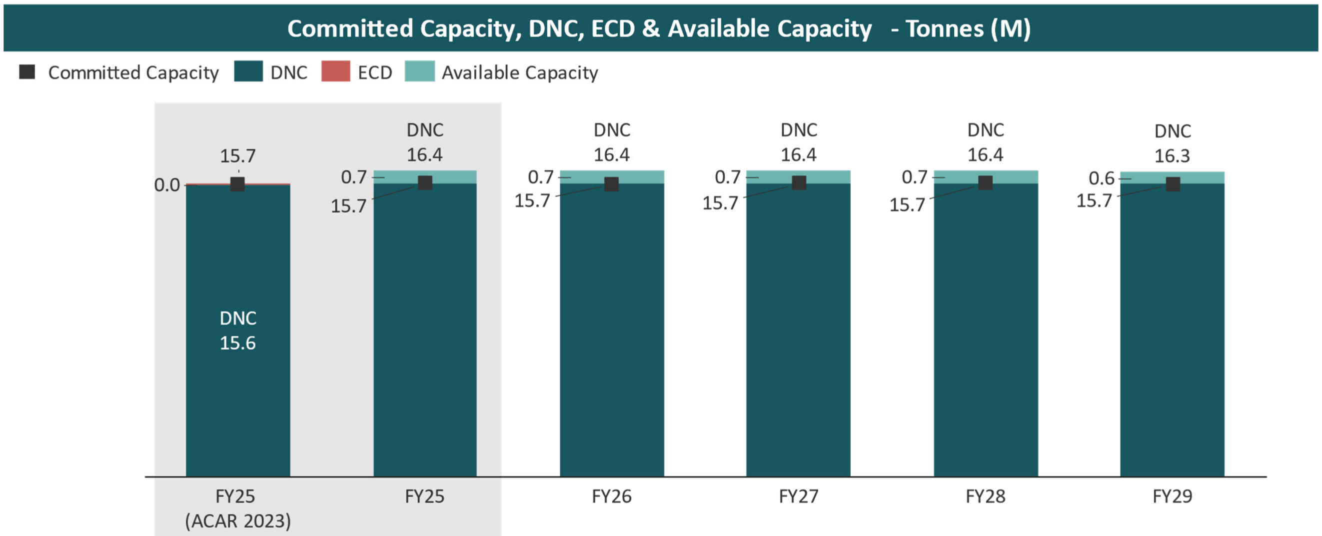


Figure 30 - Moura summary for FY25 to FY29 (Tonnes)



The DNC calculated for the Moura system by month for the five-year assessment period is shown in **APPENDIX E: Moura System Information.**

6.6 Capacity Variability

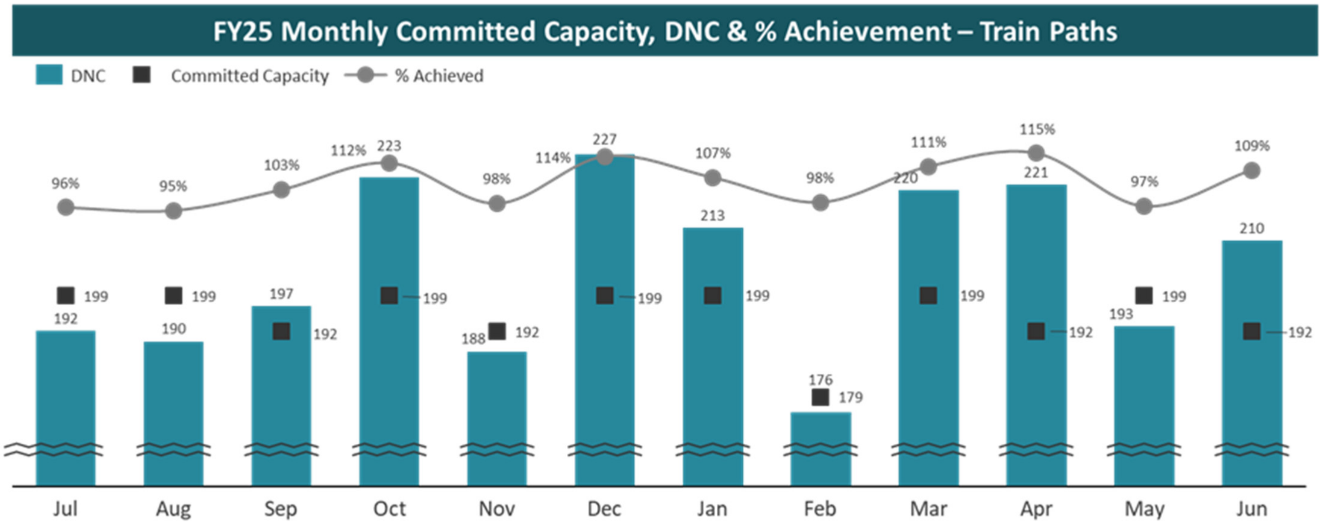
The ACAR24 Moura system DNC for FY25 of 2,445 train paths was determined from the median of 50 model simulation runs. The P90 to P10 range of the DNC was from 2,421 to 2,478 train paths as shown in **Table 16**. All model runs achieved committed capacity for FY25.

Table 16 - FY25 Moura DNC – model variability

Probability	P90	P75	Median	P25	P10
DNC (Train Paths)	2,421	2,432	2,445	2,460	2,478
DNC (Tonnes M)	16.2	16.3	16.4	16.5	16.6
Variability to median	-1.0%	-0.5%		0.6%	1.4%
Committed Capacity	2,340				

Although DNC is most frequently discussed in annual terms, the IE is required to determine each system's capacity on a monthly basis. FY25 monthly capacity in the Moura system shows considerable variability, ranging from 176 to 227 train paths, representing a range from 5% below committed capacity to 15% above committed capacity, as shown in **Figure 31** below.

Figure 31 – Moura System FY25 Monthly Capacity



6.7 Capacity Constraints and Branch line Capacity

6.7.1 Mainline and Branch line DNC

The IE is required to determine DNC for each system's mainline and branch lines. In determining system DNC, the IE increases demand for each origin-destination pair in a system simultaneously until the maximum throughput is reached. The DNC, committed capacity and ECD values, where applicable, per mainline and branch line for Moura are outlined below in **Table 17** in train paths and tonnes.

Table 17 - Moura values per Mainline and Branch line for FY25 to FY29

System	Mainline / Branch Line		Committed Capacity					DNC					ECD				
			FY25	FY26	FY27	FY28	FY29	FY25	FY26	FY27	FY28	FY29	FY25	FY26	FY27	FY28	FY29
Train Paths																	
Moura	5	M.L. - Dumgree to Callemondah	2,340	2,340	2,340	2,346	2,340	2,445	2,446	2,444	2,450	2,434	-	-	-	-	-
	5A	B.L. - Earlsfield to Dumgree	2,340	2,340	2,340	2,346	2,340	2,445	2,446	2,444	2,450	2,434	-	-	-	-	-
	5B	B.L. - Earlsfield to Callide	[redacted]														
	5C	B.L. - Earlsfield to Moura															
Tonnes (M)																	
Moura	5	M.L. - Dumgree to Callemondah	15.7	15.7	15.7	15.7	15.7	16.4	16.4	16.4	16.4	16.3	-	-	-	-	-
	5A	B.L. - Earlsfield to Dumgree	15.7	15.7	15.7	15.7	15.7	16.4	16.4	16.4	16.4	16.3	-	-	-	-	-
	5B	B.L. - Earlsfield to Callide	[redacted]														
	5C	B.L. - Earlsfield to Moura															

The values shown in **Table 17** above represent coal traffic that has a destination of that system's Port Precinct.

6.7.2 Branch line Capacity and System Constraints

The allocation of system DNC to the Moura system mainline and branch lines shown in **section 6.7.1** above does not, however, demonstrate the full potential capacity of each line in the Moura system. In respect of the mainline, this is particularly due to the interaction of the Moura and Blackwater systems both sending trains to the Callemondah precinct (RG Tanna Coal Terminal and Gladstone Powerhouse).

In order to assess the full mainline and branch line capacity, the IE has undertaken a series of model sensitivities. To determine the limits of each of the branch lines, demand was increased at the furthest TLO while reducing the Blackwater system and other Moura branch lines' mine demand to remove any constraints on the applicable branch line's capacity. The applicable TLO was unconstrained. To model the mainline capacity, Blackwater demand was reduced significantly such that it did not constrain the ability of Moura trains to transit the Callemondah precinct.

This analysis suggests that capacity in the Moura system is constrained by its mainline and branch line 5A (which both carry the same traffic). This section of track has annual capacity of approximately 200 trains above committed capacity, but this varies considerably month to month.

Branch line 5C (Earlsfield to Moura) is similar to the mainline and branch line 5A, with an annual capacity of approximately 150 trains above committed capacity, again varying considerably month to month.

Branch 5B is consistently constrained to less than committed capacity as a result of an operational restriction imposed by AN. The IE does not consider that this situation constitutes an expected capacity deficit for the Moura system as a whole.

Table 18 - Moura System Branch line Sensitivity per month

Branch Line Capacity in excess of Committed Capacity - FY25													
Line	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Total**
4A B.L. - Callemondah to Port of Gladstone	+25	+135	+20	+185	-20	+180	+90	+95	+25	+160	-45	+140	**+985**
5. M.L. - Dumgree to Callemondah	-5	-10	+15	+35	+5	+45	+25	+5	+30	+40	-5	+30	**+210**
5A B.L. - Dumgree to Earlsfield	-5	-10	+15	+35	+5	+45	+25	+5	+30	+40	-5	+30	**+210**
5B B.L. - Earlsfield to Callide	[redacted]												
5C B.L. - Earlsfield to Moura	0	-5	+10	+25	+5	+25	+20	+5	+20	+25	0	+25	**+155**

7. Abbreviations & Definitions

7.1 Abbreviations

The following abbreviations are used throughout this document:

ABBREV.	MEANING
ACAR	Annual Capacity Assessment Report
AN	Aurizon Network
BCM	Ballast Cleaning Machine
CQCN	Central Queensland Coal Network
CY	Calendar Year
DBCT	Dalrymple Bay Terminal
DNC	Deliverable Network Capacity
DTC	Direct Train Control
ECD	Existing Capacity Deficit
FSS	Full System Shut
FY	Financial Year
GAPE	Goonyella to Abbott Point Expansion
HPCT	Hay Point Coal Terminal
ICAR	Initial Capacity Assessment Report
IE	Independent Expert
Model	CQCN Dynamic Simulation Model
MRSB	Maintenance, Renewal & Strategy Budget
Mtpa	Tonnes per annum in Millions
NQXT	North Queensland Export Terminal
NRG	Gladstone Powerhouse
QAL	Queensland Alumina Limited
QCA	Queensland Competition Authority
RIG	Rail Industry Group
RCS	Remote Control Signalling
RGTCT	RG Tanna Coal Terminal
SOP	System Operating Parameters
TAs	Transitional Arrangements
TLO	Train Load Out
TP	Train Path
TSE	Train Service Entitlement
TSR	Temporary Speed Restriction
UT5	Aurizon Network 2017 Access Undertaking
WICET	Wiggins Island Coal Export Terminal

7.2 Definitions

MEASURE	DEFINITION
Train Service Entitlement (TSE)	An Access Holder's entitlement pursuant to an Access Agreement to operate or cause to be operated a specified number and type of Train Services over the rail infrastructure (as defined in UT5) including within a specified time period, in accordance with specified scheduling constraints and for the purpose of either carrying a specified commodity or providing a specified transport service (UT5). Note that two TSEs are required per train cycle.
Train Cycle	In general, Train Cycles typically proceed as follows: 1. Dispatch from yard 2. Travel empty to mine 3. Load at TLO 4. Travel loaded to rail receival station 5. Unload 6. Travel empty to yard 7. Provisioning or maintenance (if required) 8. Wait for next dispatch Cycle Time measures items 1 to 6 Turnaround Time measures items 1 to 8
Train Path (TP)	Is the occupation of a specified portion of rail infrastructure, which may include multiple sections in sequential order, for a specified time. UT5 outlines that such Train Paths needing to be useable including in respect of return journeys. One (1) Train Path is equivalent to two (2) TSEs.
Train Loadouts (TLO)	The upstream boundaries of the model are the Train Loadout (TLO) facilities at each mine, with their associated balloon loop. Coal enters the Model at these facilities.
Cycle Time	Represents the time a train takes to operate its Train Cycle from departing the yard to returning to the yard.

APPENDIX A: Newlands System Information

UT5 requires the IE to determine DNC for each system in the CQCN. Capacity modelling for Newlands and GAPE has been conducted simultaneously, given that both use the same mainline and currently share the same capacity constraint. In order to meet the UT5 requirement, the IE has presented DNC for each system separately. These values are the allocations of DNC (and therefore ECD) to the various origin-destination combinations in each system from the combined analysis. They do not reflect a judgement regarding the origin of any capacity deficit.

Chart A1: Newlands summary for FY25 to FY29 (Train Paths and Tonnes)

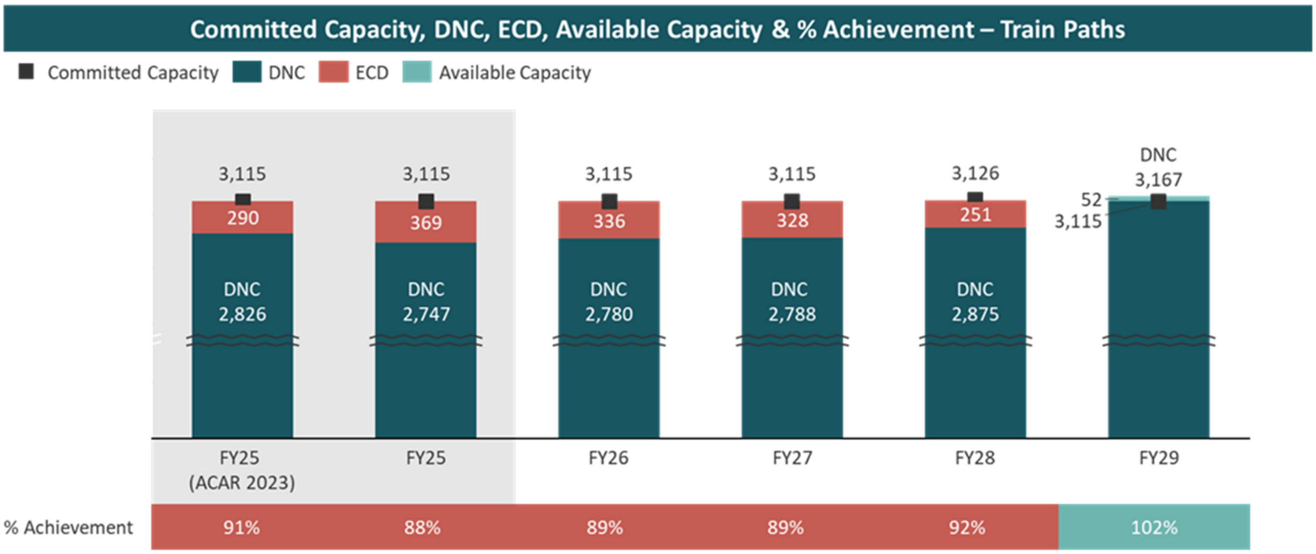


Chart A2: Newlands summary for FY25 to FY29 (Tonnes)

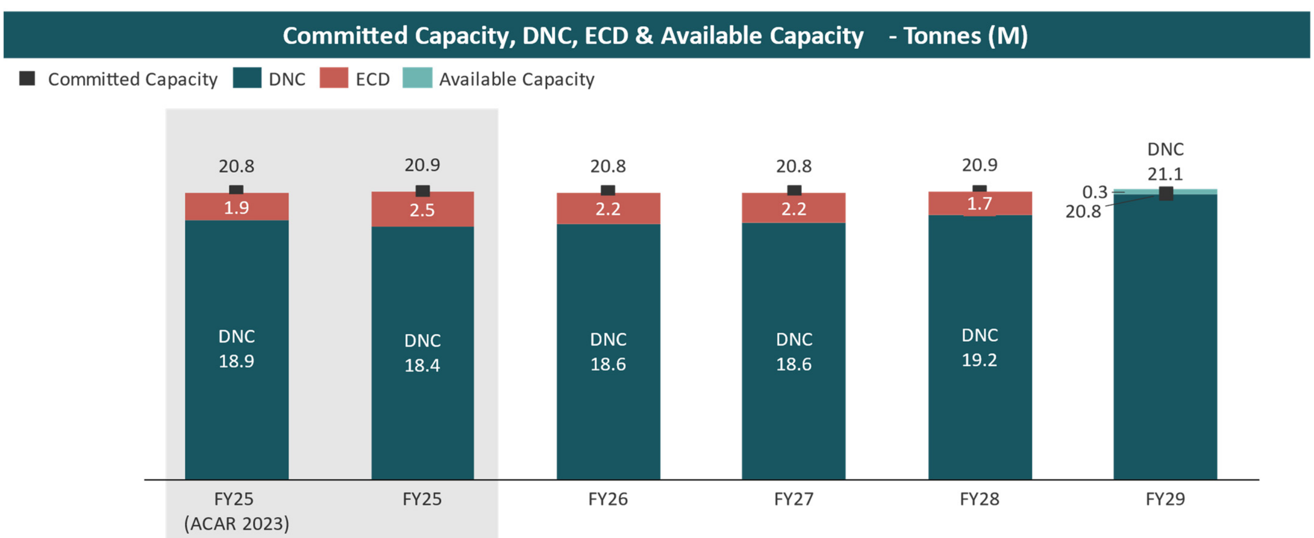
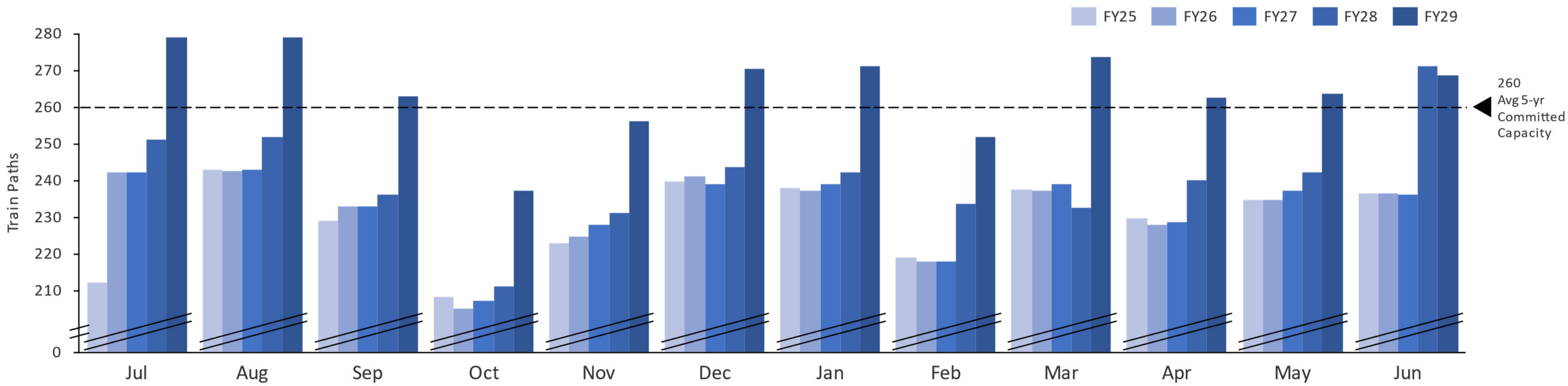


Chart A3: Newlands System DNC per month per year



	Month											
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
FY25	212	243	229	208	223	240	238	219	238	230	235	237
FY26	242	243	233	205	225	241	237	218	237	228	235	237
FY27	242	243	233	207	228	239	239	218	239	229	237	236
FY28	251	252	236	211	231	244	242	234	233	240	242	271
FY29	279	279	263	237	256	271	271	252	274	263	264	269

APPENDIX B: GAPE System Information

UT5 requires the IE to determine DNC for each system in the CQCN. Capacity modelling for Newlands and GAPE has been conducted simultaneously, given that both use the same mainline and currently share the same capacity constraint. In order to meet the UT5 requirement, the IE has presented DNC for each system separately. These values are the allocations of DNC (and therefore ECD) to the various origin-destination combinations in each system from the combined analysis. They do not reflect a judgement regarding the origin of any capacity deficit.

Chart B1: GAPE summary for FY25 to FY29 (Train Paths)

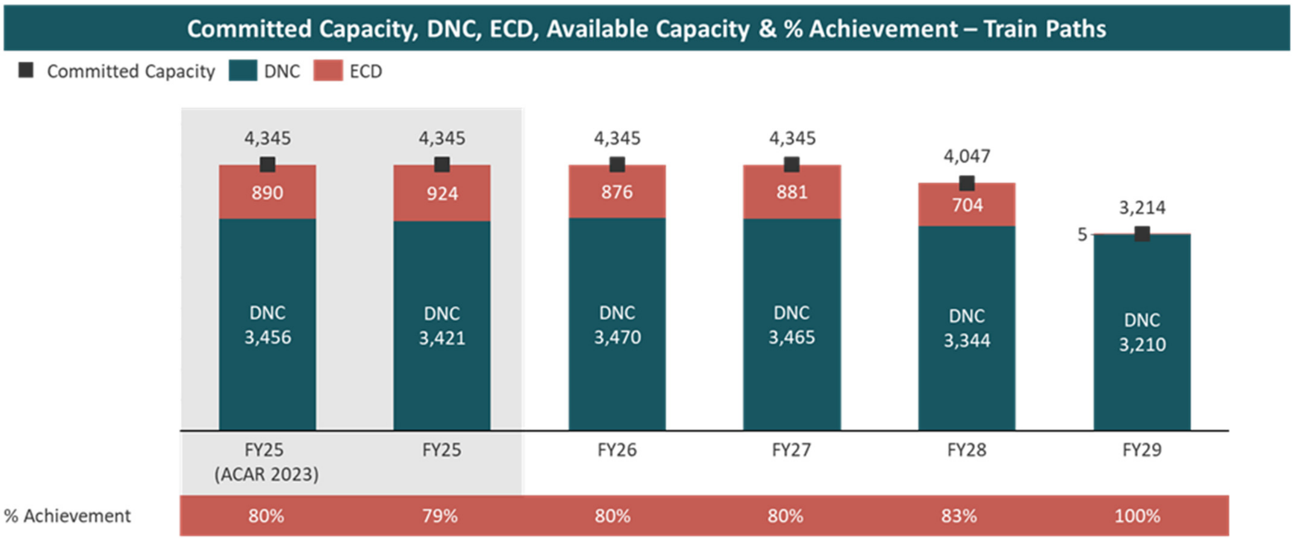


Chart B2: GAPE summary for FY25 to FY29 (Tonnes)

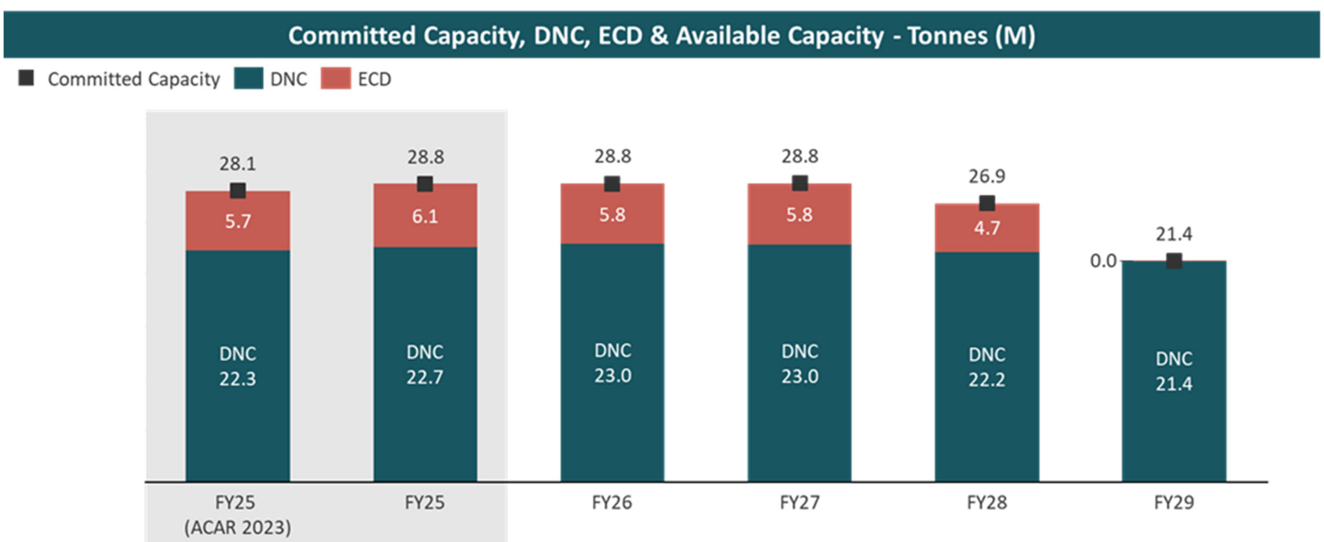
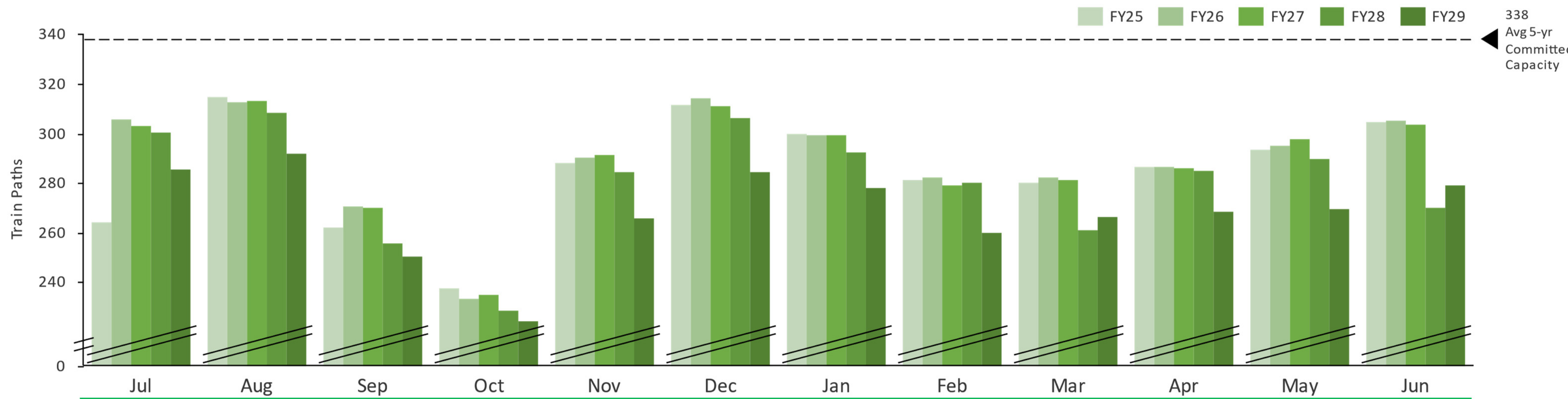


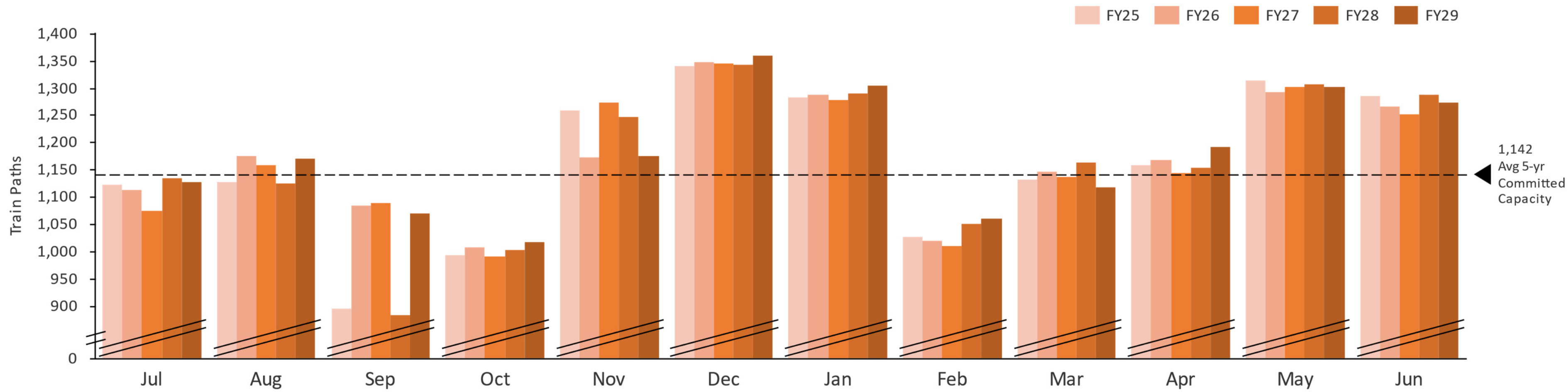
Chart B3: GAPE System DNC per month per year



	Month											
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
FY25	264	315	262	238	288	312	300	281	280	287	294	305
FY26	306	313	271	233	290	314	299	282	282	287	295	305
FY27	303	313	270	235	291	311	299	279	281	286	298	304
FY28	301	308	256	229	284	306	292	280	261	285	290	270
FY29	286	292	250	224	266	284	278	260	266	269	270	279

APPENDIX C: Goonyella System Information

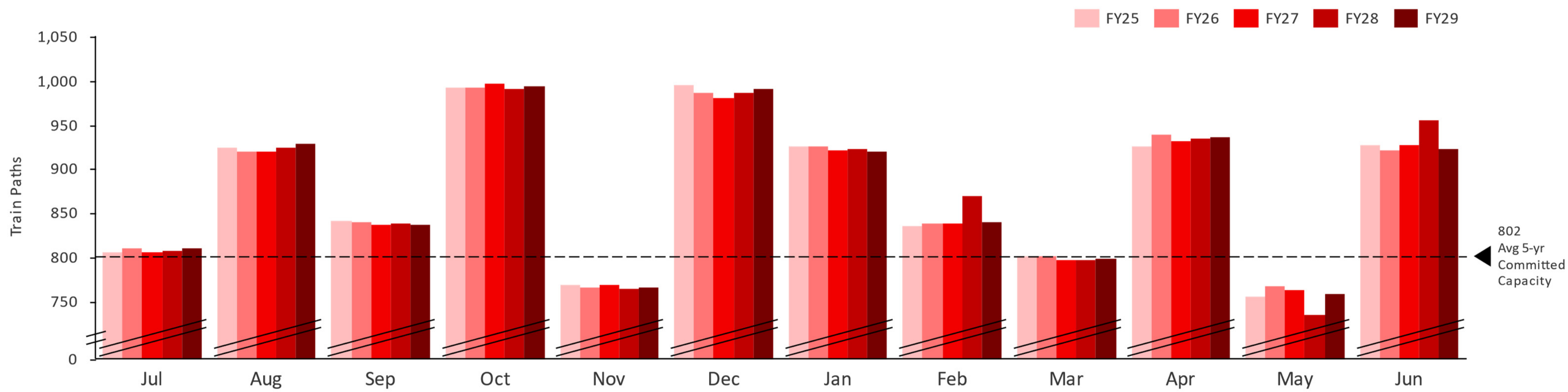
Chart C1: Goonyella System DNC per month per year



Year	Month											
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
FY25	1,123	1,126	895	994	1,257	1,340	1,283	1,026	1,132	1,158	1,313	1,284
FY26	1,112	1,176	1,084	1,008	1,172	1,346	1,286	1,020	1,147	1,167	1,292	1,265
FY27	1,075	1,159	1,089	991	1,273	1,344	1,278	1,009	1,137	1,145	1,302	1,252
FY28	1,133	1,125	885	1,003	1,246	1,343	1,288	1,051	1,163	1,154	1,306	1,286
FY29	1,128	1,169	1,070	1,018	1,175	1,359	1,304	1,061	1,117	1,192	1,302	1,274

APPENDIX D: Blackwater System Information

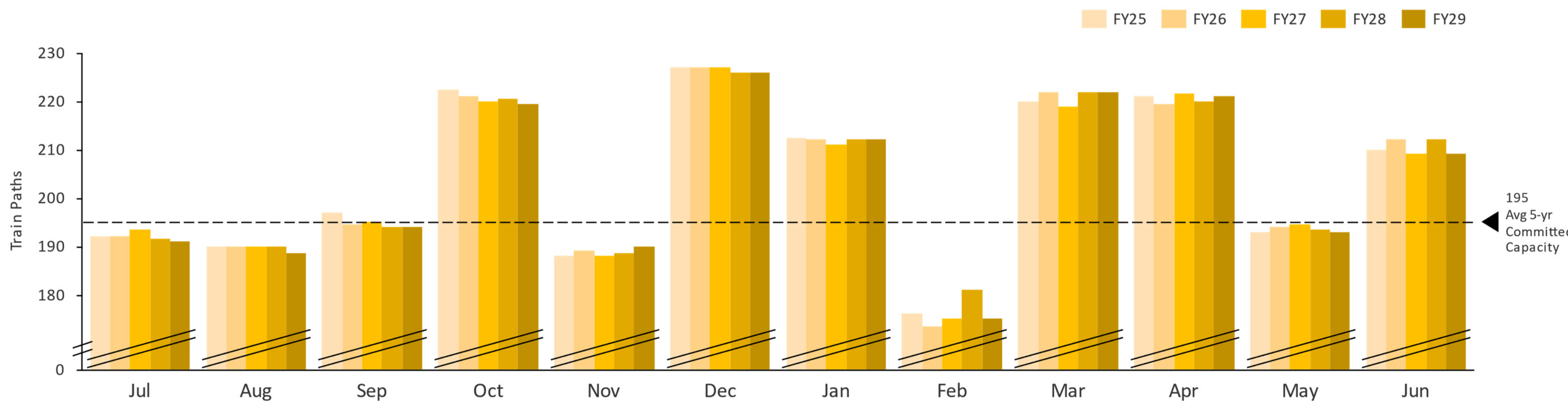
Chart D1: Blackwater System DNC per month per year



	Month											
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
FY25	806	924	841	992	770	996	925	836	802	926	757	927
FY26	811	920	840	993	767	986	926	839	803	939	769	921
FY27	807	920	837	997	770	981	921	840	797	931	763	927
FY28	808	925	839	990	766	987	923	870	798	935	736	956
FY29	812	929	837	993	767	991	919	841	799	936	760	923

APPENDIX E: Moura System Information

Chart E1: Moura System DNC per month per year



	Month											
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
FY25	192	190	197	223	188	227	213	176	220	221	193	210
FY26	192	190	195	221	189	227	212	174	222	220	194	212
FY27	194	190	195	220	188	227	211	175	219	222	195	209
FY28	192	190	194	221	189	226	212	181	222	220	194	212
FY29	191	189	194	220	190	226	212	175	222	221	193	209