ACAR25

SYSTEM OPERATING PARAMETERS

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REDACTED VERSION

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Contents

1. Introduction

1.1. Requirements of 2017 Access Undertaking (UT5)

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

The Initial Capacity Assessment Report (ICAR) and associated System Operating Parameters (SOP) was issued in October 2021.

UT5 specifies an Annual Capacity Assessment (ACAR) is required after the ICAR has been issued, and this assessment will determine the Deliverable Network Capacity (DNC) as defined in *section 7A.2 Definition of Deliverable Network Capacity (DNC)*.

UT5 also requires that:

- the assessment of capacity shall be based on an analysis using a Dynamic Simulation Model (Model) of the Central Queensland Coal Network (CQCN); and
- the SOP be documented. The SOP include the assumptions, inputs and methods used in the Model for the analysis of DNC.

When an ACAR is undertaken, it is based on a definition of Capacity and the application of a defined methodology and input parameters. This document is the SOP and describes:

- the definition of DNC;
- the methodology;
- the input parameters used; and
- an explanation of why these inputs have been used when undertaking the ACAR.

1.2. Definition of Deliverable Network Capacity

The following extract defining DNC is taken from Part 7A.2 of UT5.

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 takeninto 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 coalexport 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 that coal system.*

The DNC must be reported in train paths. All references to DNC will be in train paths. Train Service Entitlements (TSE) and tonnes will only be used for reporting and explanatory purposes.

1.3. Addressing Deliverable Network Capacity

The analysis of DNC must take into account the operation of each coal system, having regard to the factors identified in **Table 1** below. The table lists the sections of the SOP where consideration of these factors is addressed.

Table 1 - Deliverable Network Capacity factors to be considered

UT5 Clause 7A.2(a)		Addressed in SOP Section
(i)	*the way in which the relevant coal system operates in practice, including those matters taken into consideration in formulating the System Operating Parameters;*	All
(ii)	*reasonable requirements in respect of planned maintenance and a reasonable estimate of unplanned maintenance, repair, renewal and Expansion activities on the rail infrastructure;*	**Section 8** Below Rail Operations **Section 10** System Delays
(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;*	**Section 9** Above Rail Operations **Section 10** System Delays
(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;*	**Section 9** above rail Operations **Section 10** System Delays
(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);*	**Section 6** Train Loadouts **Section 7** Inloaders
(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;*	**Section 11** Non-Coal Traffic
(vii)	*the supply chain operating mode (including at the loading facilities, load out facilities and coal export terminal facilities);*	**Section 6** Train Loadouts **Section 7** Inloaders **Section 8** Below Rail Operations **Section 10** System Delays
(viii)	*interfaces between the different coal systems; and*	**Section 4** Rail Infrastructure
(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 that coal system.*	**Section 5** Demand

1.4. Information and Redaction

To avoid any confusion with industry standard terminology conventions, including the reference to gross or net values, the names of loading and unloading rates have been expanded to clarify whether parameters include or exclude operational delays. Explanations of all operating parameters are outlined in the relevant sections of this document.

To the extent possible, this document has been drafted on an unredacted basis. Where the SOP contains information that is confidential to an access holder, customer or train operator and is unable to be disclosed, it has been redacted or incorporated into appendices, which will be redacted when published.

2. System Operating Parameters

The Independent Expert (IE) uses three layers of documentation to record and determine the DNC:

- **Model Basis Documents/Detailed Data Analysis**
  Internal documentation showing detailed statistical and data analysis and commentary on assumptions used to manage the Model.

- **System Operating Parameters**
  External document that accompanies the ACAR each year. The SOP as outlined in UT5, represent the assumptions on the operation of each element of the coal supply chain and the interfaces between those elements including the supply chain operating mode, seasonal variations and live run losses.

- **Annual Capacity Assessment Report**
  External capacity report that is completed annually, which shows the specific capacity values and associated impact on the network and each individual coal system. These reports will highlight any differences in Model inputs and outputs from year to year.

These assumptions are used in the Model for the analysis of DNC. This document aims to provide the reader with an understanding of the SOP and how they are measured and treated within the Model for each coal system.

2.1. Structure of System Operating Parameters

The SOP is broken down into the following key areas:

- General assumptions;
- Rail infrastructure;
- Demand;
- Train Loadout (TLO) which represents the upstream boundary of the Model;
- Below rail operations;
- Above rail operations;
- Terminal Inloader for both export and domestic users which represents the downstream boundary of the Model;
- System delays; and
- Non-coal traffic.

For each key area, the parameters that impact the determination of DNC have been analysed and this document outlines how the Model treats each of these.

2.2. Model Scope

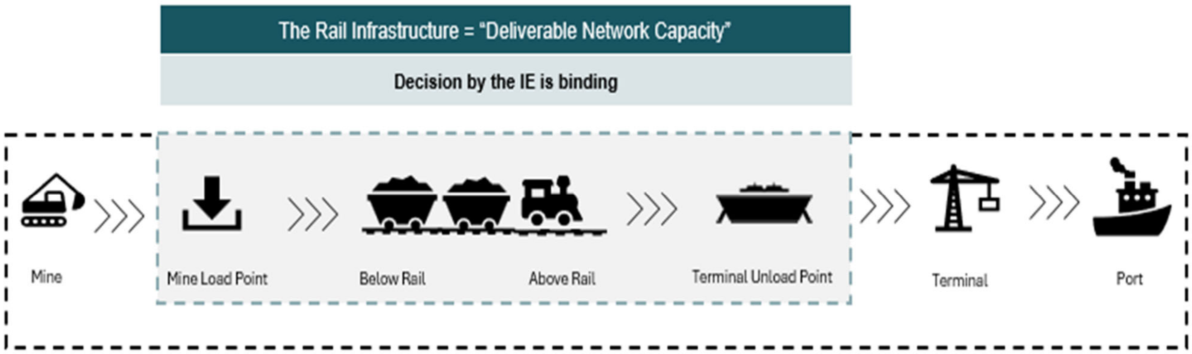
A Model has been developed using the AnyLogic modelling software to determine the DNC of the CQCN and for each coal system.

As a result, the scope of the Model reflects the DNC definition and is between the boundaries of:

- Coal flow into wagons at TLOs; and
- Coal flow out of wagons at rail receival stations (inloaders).

and includes the components as outlined in **Figure 1**.

Figure 1 - Deliverable Network Capacity Boundaries



3. General Assumptions

There are several general assumptions used in the Model and SOP:

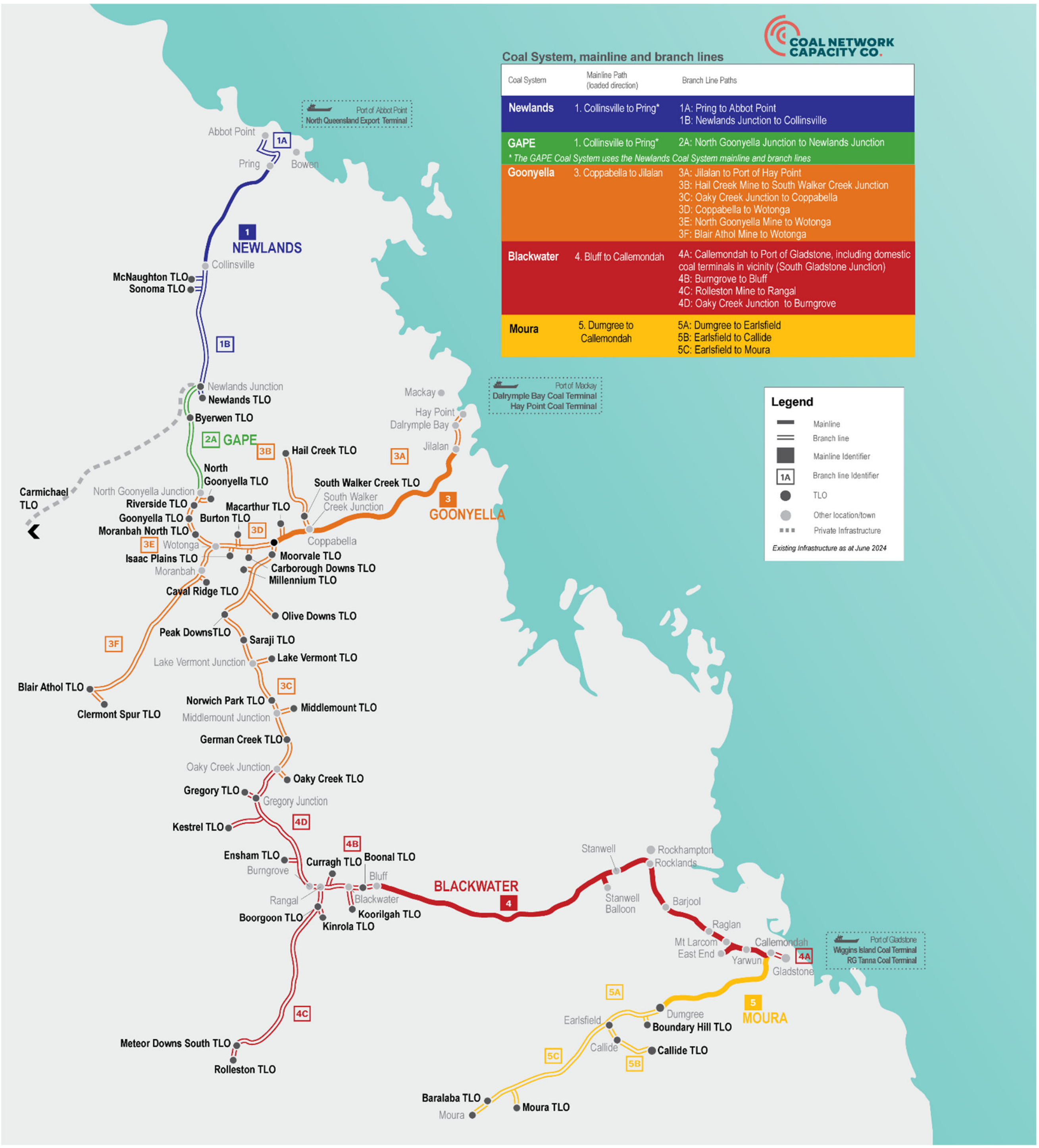
- The IE has had to exercise judgement on a large range of issues in developing the SOP assumptions and application of these within the Model. These are called out as appropriate in each section of the SOP;
- UT5 requires that the capacity assessment period of each ACAR to be five years or if peak capacity under the access agreements is expected to occur outside of five years, a longer period of time to include that peak contracted capacity. The IE has determined from the data, that for ACAR25 the peak capacity occurs within the five-year capacity assessment period of FY26 to FY30. The capacity assessment period for the ACAR is for the five financial years FY26 to FY30 inclusive i.e. 1 July 2025 to 30 June 2030;
- Train paths include coal for export through terminals, domestic coal users and non-coal traffic;
- Unless stated otherwise in the relevant SOP section, the most recent historical data from January 2024 to December 2024 has been used and analysed along with previous years historical data to develop key data statistical distributions sued in SOP assumptions and the Model;
- Where statistical distributions are used to provide inputs to the Model, a range of statistical distributions are compared to identify the distribution that best approximates the historical data. The selection of the most appropriate distribution uses a combination of a quantitative comparison method - the Akaike Information Criterion (AIC) - and the qualitative judgement of the IE; and
- Transitional arrangements (i.e. capital investment or operating practice changes for the purposes of resolving an existing capacity deficit) that have been approved by the QCA and are either implemented by AN or have been approved by the IE as “Prudent and Efficient” are included in capacity modelling from their expected completion date. While there is partial use of the Collinsville passing loop within the Newlands system, this does not yet represent the implementation of a transitional arrangement or standard operating practice and, as such, has not been considered in ACAR25.

4. Rail Infrastructure

4.1. Coal Systems

Figure 2 shows the modelled rail infrastructure which covers the five coal systems of the CQCN (as outlined in UT5). Newlands System and the GAPE System are not modelled independently of each other as they share common infrastructure.

Figure 2 - Extent of Modelled Rail Infrastructure



The five CQCN coal systems and the associated branch lines and mainlines used in the Model to assess the DNC are outlined in **Table 2.**

Table 2 - Coal System, 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 **the GAPE System uses the Newlands System Mainline and branch lines.*	1.Collinsville to Pring*	2A: North Goonyella Junction to Newlands Junction
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 specific sections of each coal system that have been modelled in the Model are listed in **Table 3.** Some smaller spur lines between TLO's and a branch line or mainline are modelled in the Model however may not be noted in **Table 3.**

Table 3 - Extent of Modelled Rail Infrastructure

Goonyella System	• DBCT to Jilalan	
	• HPCT to Jilalan	
	• Jilalan to Coppabella	*(the Trunk, Goonyella mainline)*
	• Coppabella to Wotonga	*(the Trunk)*
	• South Walker Junction to Hail Creek mine	*(the Hail Creek branch)*
	• Coppabella to Oaky Creek Junction	*(the South Goonyella branch)*
	• Wotonga to North Goonyella	*(the North Goonyella branch)*
	• Wotonga to Blair Athol	*(the West Goonyella branch)*
Newlands System	• NQXT to Kaili	
	• Kaili to Durroburra	*(North Coast Line)*
	• Durroburra to Pring	
	• Pring to Collinsville	*(Newlands mainline)*
	• Collinsville to Newlands Junction	
GAPE System	• Newlands Junction to North Goonyella Junction	*(the Goonyella-Newlands connection)*

Blackwater System	• Oaky Creek to Burngrove	*(Gregory branch)*
	• Rolleston to Rangal	*(Bauhinia branch)*
	• Burngrove to Rangal to Bluff	
	• Bluff to Rocklands	*(Blackwater mainline)*
	• Rocklands to Aldoga	*(North Coast Line)*
	• Aldoga to WICET	
	• Aldoga to Callemondah	*(North Coast Line)*
	• Callemondah to RGTCT	
	• Callemondah to NRG (Gladstone Powerhouse)	
	• Mt Miller to RTA Yarwun and Fisherman's Landing	
	• East End Junction to East End Balloon Loop	
Moura System	• Callemondah to South Gladstone to QAL	*(Moura Short Line)*
	• Callemondah to Dumgree	*(Moura mainline)*
	• Dumgree to Earlsfield	
	• Earlsfield to Callide	
	• Earlsfield to Baralaba	

4.2. Private Infrastructure

DNC is determined on rail infrastructure as defined in UT5. Private infrastructure does not form part of the definition of rail infrastructure, however, it is included in the Model to simulate infrastructure interfaces within the rail infrastructure.

The Model considers all Private Infrastructure for coal and non-coal traffic as included in **Appendix D: Modelled Rail Infrastructure for Private Infrastructure.**

Boundary locations where modelled non-coal traffic may enter the CQCN include:

- Newlands-GAPE System: Kaili, Durroburra
- Goonyella System: Yukan, Mt McLaren
- Blackwater System: Rocklands, Nogoa, Parana
- Moura System: N/A

4.3. Electrification

Much of the CQCN is electrified and can operate electric trains. Those parts that are not electrified and therefore can only operate diesel trains are shown below:

- Newlands System - entirely unelectrified including:
  - the Goonyella-Newlands connection; and
  - the Carmichael branch line
- Goonyella System:
  - Wotonga angle allowing West Goonyella branch line trains to turn onto the North Goonyella branch line; and
  - Blair Athol mine at Clermont Spur TLO
- Blackwater System:
  - Mt Miller to RTA Yarwun and Fisherman's Landing; and

- QAL siding.
- Meteor Downs South balloon loop

- Moura System – entirely unelectrified.

4.4. Signalling

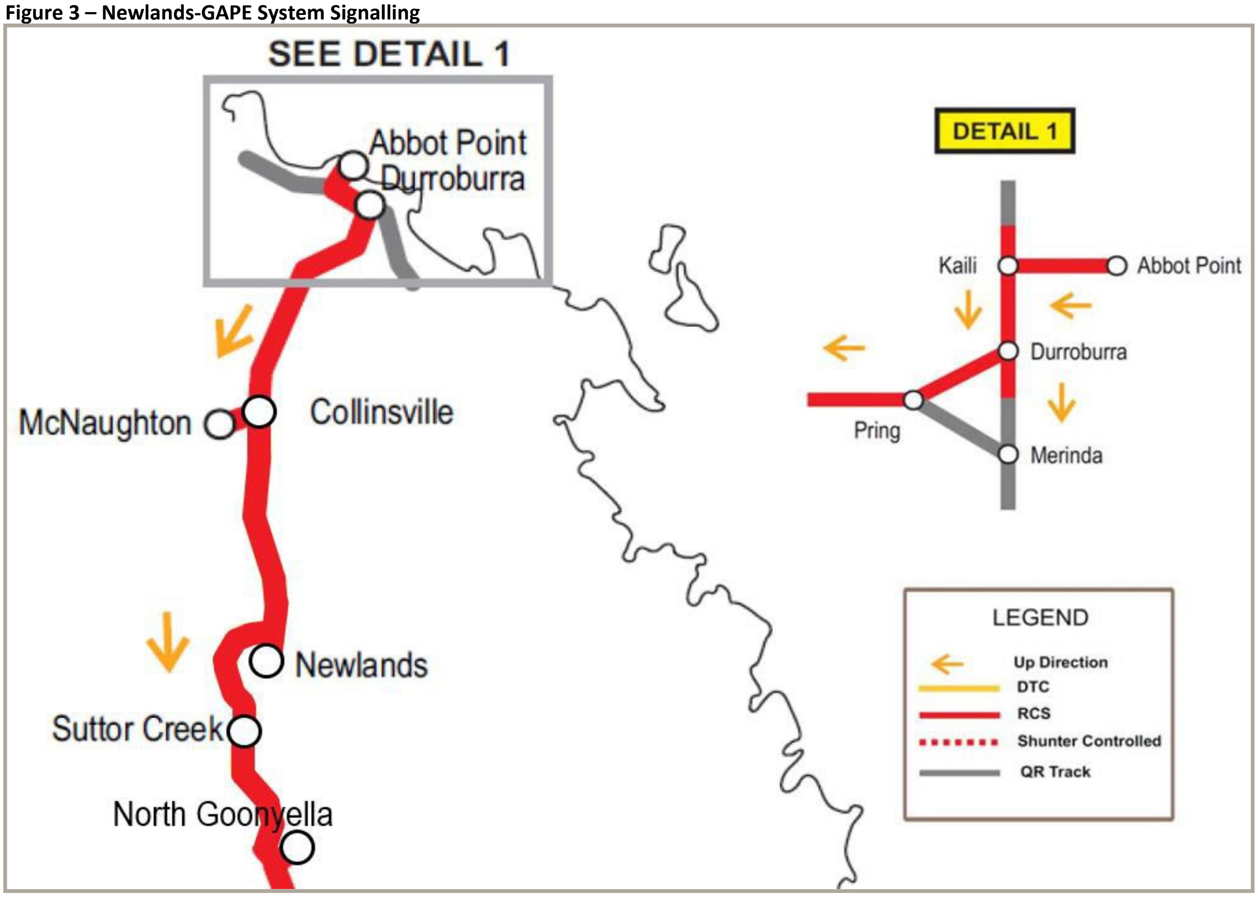
The CQCN uses Remote Control Signalling (RCS) and Direct Train Control (DTC). The Model considers signalling that is installed in the CQCN.

The signalling configuration for each coal system as shown below is sourced from AN's information pack which was last updated in March 2017. The SOP and Model include implementation of the transitional arrangement to convert from DTC to RCS signalling for the section of the Newlands System between McNaughton and Newlands Junction (NG1-RCS) from July 2024.

Newlands-GAPE System

The Newlands System currently operates entirely on RCS signalling.

Figure 3 – Newlands-GAPE System Signalling

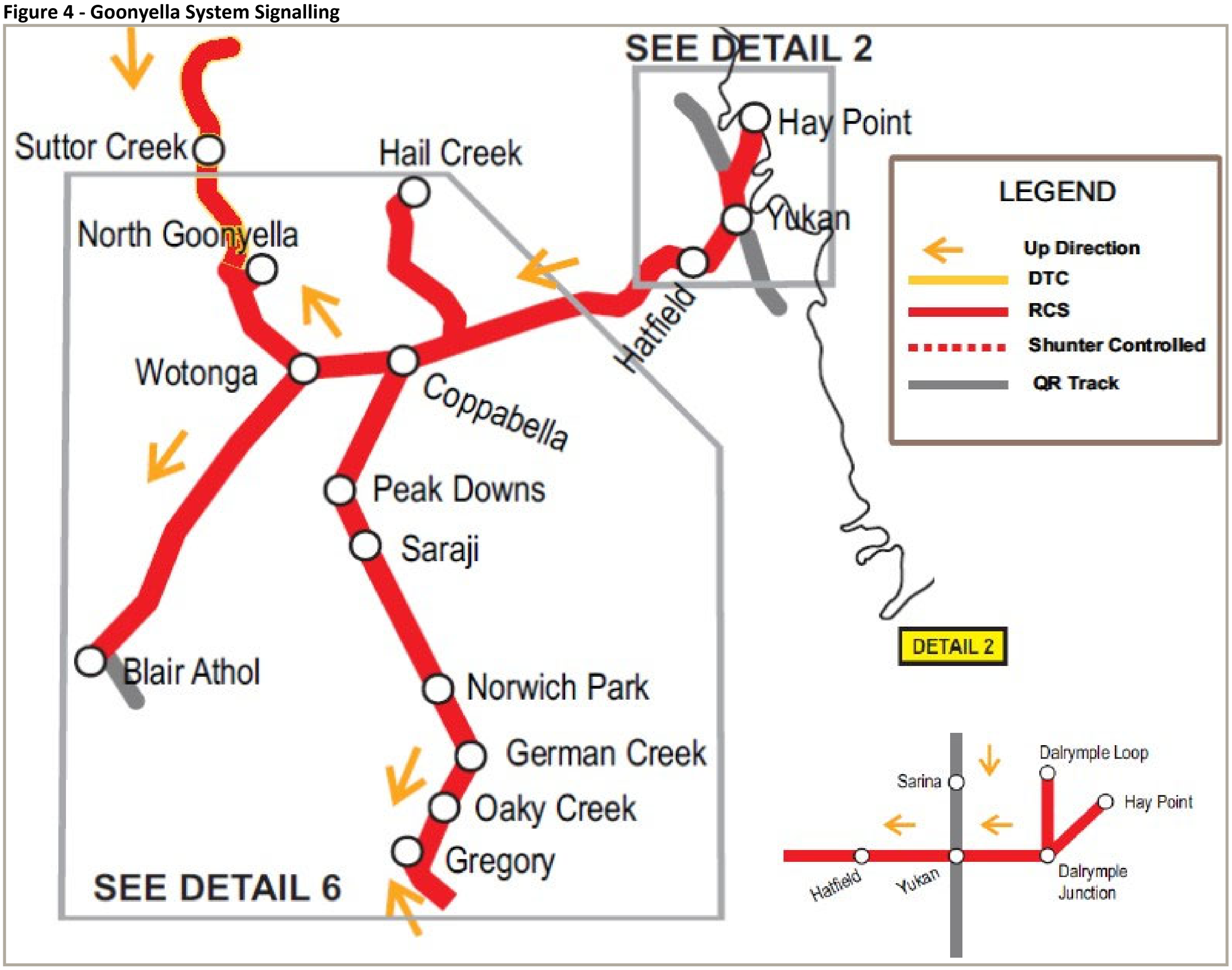


SOURCE: Aurizon Network Report: Newlands System Information Pack – Issue 7.0 March 2017

Goonyella System

The Goonyella System has RCS installed throughout.

Figure 4 - Goonyella System Signalling

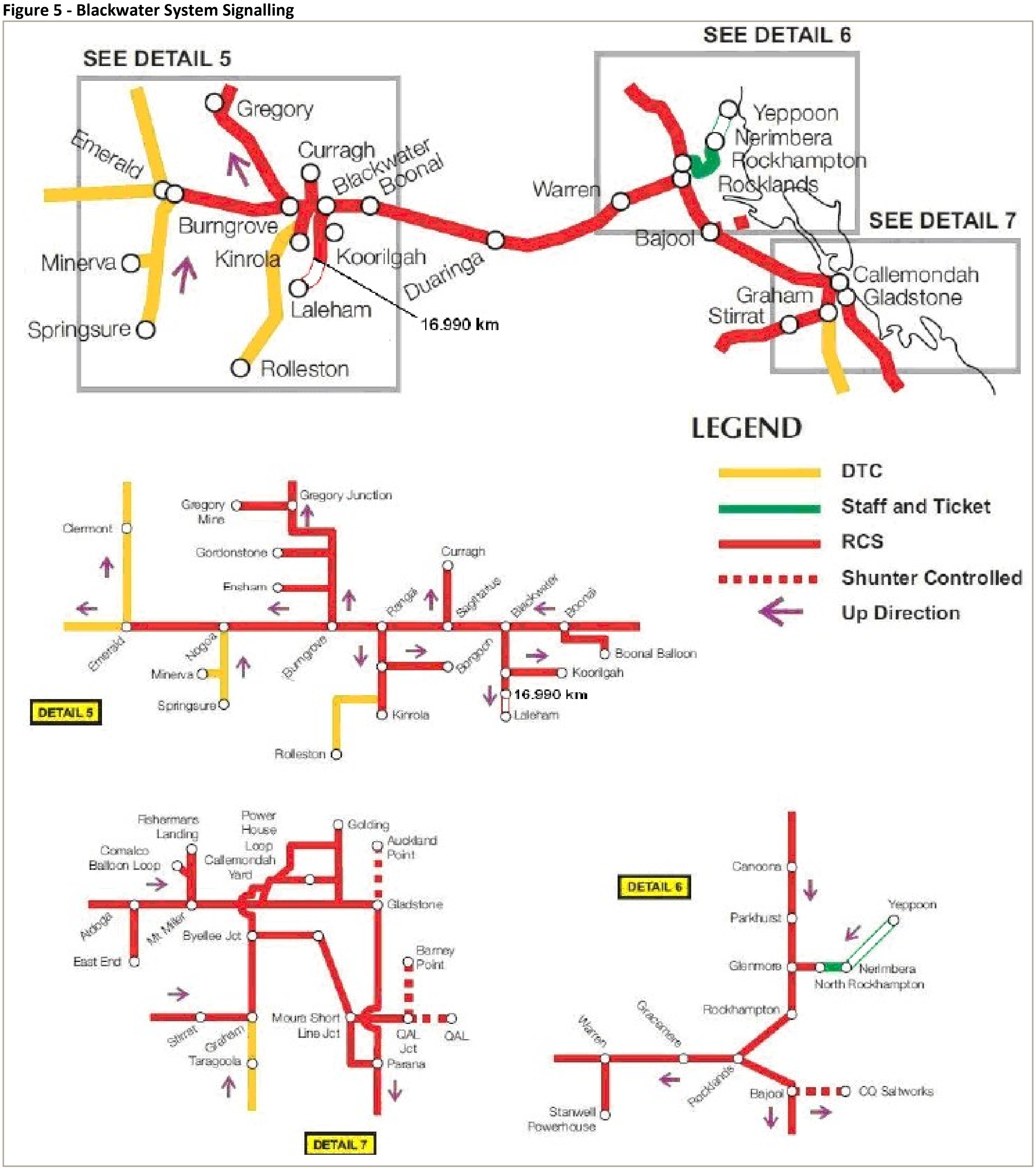


SOURCE: Aurizon Network Report: Goonyella System Information Pack – Issue 7.0 March 2017

Blackwater System

The Blackwater System has RCS installed throughout except for the section of the Bauhinia Branch from the Kenmare passing loop to the Rolleston mine where DTC Directional Running operates.

Figure 5 - Blackwater System Signalling

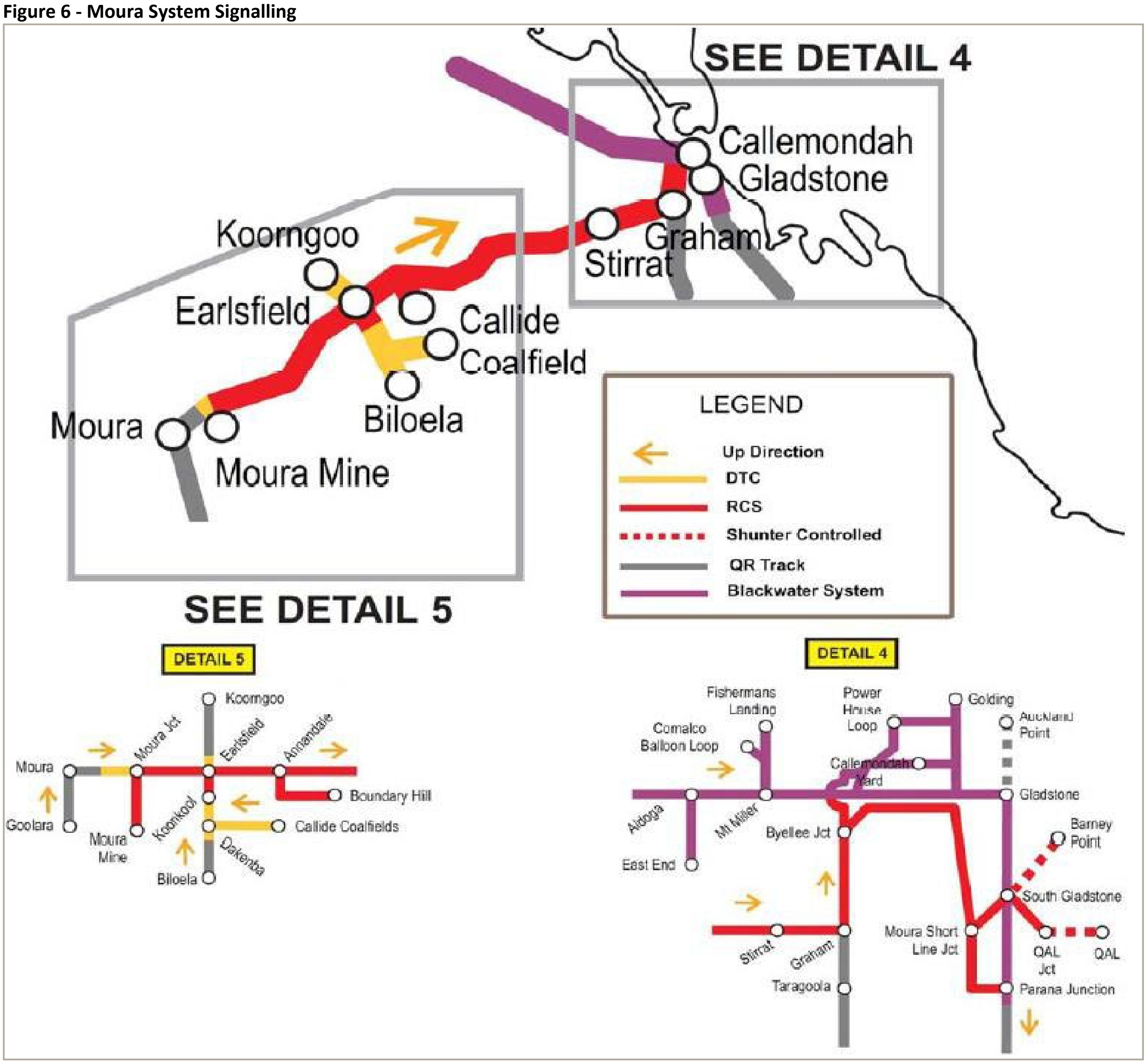


SOURCE: Aurizon Network Report: Blackwater System Information Pack – Issue 7.0 March 2017

Moura System

The Moura System is largely RCS except for DTC on the Dakenba branch (to Callide) and DTC-MLPI west of Moura mine junction to Baralaba.

Figure 6 - Moura System Signalling



SOURCE: Aurizon Network Report: Moura System Information Pack – Issue 7.0 March 2017

4.4.1. Remote Control Signalling (RCS)

Rail traffic movements are regulated by signals controlled from a remote location and/or automatically by the passage of rail traffic. Only one rail traffic movement can be on a signalled section at one time. This is the default mode of operation of the Model.

4.4.2. Direct Train Control (DTC) signalling

Rail traffic movement is governed by instructions contained in DTC authorities issued by the AN network control officer to rail traffic crew. DTC authorities give rail traffic possession of blocks of track. The crossing of trains at passing loops incurs delays that are in addition to the time the first train spends waiting for the second train to cross. The remaining instances of DTC signalling in the CQCN are described as “Directional Running”. Under this signalling arrangement, passing loop turnouts are arranged with trailable facing points such that trains can travel through the passing loop without requiring the train crews to operate turnouts.

When trains cross at these passing loops, delays apply in addition to Sectional Running Times (SRT) and stopping and starting durations:

- The first train to arrive at the passing loop stops and incurs a delay of 10 minutes;
- The second train must also stop at the passing loop, and incurs a delay of 10 minutes, then departs;
- Once the second train has departed the passing loop, the first train incurs a further delay of six minutes before being allowed to depart.

4.5. Rail Depots

The modelled rail depots are listed in **Table 4.**

Table 4 - Modelled Rail Depots

Coal systems	Modelled Depots
Newlands-GAPE	Pring, BRC (adjacent to Abbot Point)
Goonyella	Jilalan, Nebo
Blackwater, Moura	Callemondah

Depots are modelled at a macro, rather than micro, level. AN's line diagrams show the depots with red roads (owned and operated by AN), blue roads (owned by Aurizon Operations (AO)) and yellow roads (other above rail operators). The blue and yellow roads are where major wagon and locomotive maintenance is done.

From a modelling perspective, the Model assumes for rail depots:

- Queueing roads for loaded trains waiting for an inloader and for empty trains waiting for dispatch;
- Locations where trains may be provisioned, examined, or have crew changes; and
- Uses data assumptions provided by above rail operators on provisioning cycles, time for provisioning, crew change timing within depots and unit time maintenance for each consist type.

The regularly scheduled break-up, shunting and reconstitution of consists from network track to private maintenance facilities is modelled as block change outs. See **Section 9.2.1 - Planned Maintenance** for more detail.

The number of roads modelled at each rail depot are listed in **Table 5.**

Table 5 - Number of roads at each rail depot

Rail Depot	Number of Roads
Pring	6
BRC	3
Jilalan	15
Nebo	3
Callemondah	12

At Callemondah, the Model does not distinguish between arrival roads and departure roads. All roads are pooled and can be used for queueing either loaded or empty trains. The Powerhouse roads are considered separate to the depot. Restrictions on the number of trains that can be provisioned or maintained at the same time effectively mimic the limited number of arrival and departure roads.

In the Newlands System, the number of roads at the BRC depot was revised from 1 to 3 as per **Table 5.** This change comes together with the inclusion of the BRC provisioning activities, which take place at the holding roads of the BRC yard and were not included in ACAR24. These updates were applied to better represent the infrastructure and operations that take place.

4.6. Location Specific Features

The following location specific features are noted:

1. Pring based trains are currently too long to use the Collinsville passing loop so this loop has been temporarily removed from the Model's network infrastructure. Instead, trains will cross at the Birralee passing loop or the Briaba to Almoola section. This is despite the occasional use of the loop by trains short enough to fit in the current infrastructure;

[redacted]

6. The following passing loops are removed from the network definition as they are not used by coal trains:
    a. Mt Larcom not used for coal traffic; and
    b. Bajool not used as a passing loop (AN use this infrastructure to store equipment such as maintenance equipment but this is not explicitly modelled);
7. The track from South Gladstone to Barney Point is not included in the Model;
8. Not all the sections of the North Coast Line are included in the Model;

[redacted]

4.7. Sectional Running Times

SRTs describe how long it takes an empty or loaded train to traverse each track section. SRTs are sourced from AN's operational data. When AN changes scheduled SRTs, these changes are reviewed by the IE with comparison to observed SRT performance.

- Coal traffic SRTs are shown in **Appendix A: Sectional Running Times.**
- Non-coal traffic SRT's are shown in **Section 11: Non-Coal Traffic** and ***Appendix A: Sectional Running Times****.*

In some instances, sections have been divided into two to accommodate a proposed new mine and its balloon loop/TLO (see **Section 6 - Train Loadouts**). Where this has been done, the SRT has been distributed across the two sections in proportion to their length.

4.8. Stopping and Starting Delays

In addition to SRTs, the Model applies a start/stop delay which is specific to each section. For the purposes of brevity, we have summarised the average values for each system as outlined in the **Table 6** below.

Table 6 - Stopping and starting delays by coal system

System	ACAR24		ACAR25	
	Start delay (mins)	Stop delay (mins)	Start delay (mins)	Stop delay (mins)
Newlands-GAPE	4	2	4	2
Goonyella	5	4	5	4
Blackwater	2	3	2	3
Moura	2	3	2	3

5. Demand

5.1. Measurement of Demand

DNC is measured in train paths.

The Model considers demand as a critical primary driver for train services, i.e., requests for the delivery of coal, from mines to terminals and domestic users and for non-coal traffic.

The Model uses TSEs as the input for demand, with two TSEs required for each coal service (reflecting empty and loaded journeys).

UT5 requires the ACAR to be based on a DNC analysis linked to "the extent to which the Deliverable Network Capacity can deliver the committed capacity". Committed capacity is the portion of capacity that is required to meet TSE's, renewal obligations, and passenger priority obligations or preserved path obligations, to provide access rights where AN has contractually committed to expansion or customer specific branch line in relation to those access rights.

Consistent with UT5, demand and nis determined by the aggregate of users' access agreements. Committed capacity is used as the base demand profile against which DNC is assessed, and if necessary, demand for all committed capacity is scaled up linearly (i.e. equally for all users) until DNC of the network is reached. This assessment is undertaken at a coal system level.

Demand data for the DNC is based on AN contractual capacity as at 9 May 2025, which includes new access executed in the Goonyella System. This data represents contracted TSEs per 30-day month up to and beyond the end of the FY26 to FY30 capacity assessment period (1 July 2025 to June 2030). Where access agreements have rights for renewal occurring during the capacity assessment period, contracted TSEs per month are extended up to June 2030, based on the location and capacity level of the final month of the existing contract.

5.2. Model Implementation of Demand

To simulate demand for train services in the Model, a list of rail "jobs" is created for each system (including all destinations in that system). Each rail job corresponds to a set of one or more train orders for a given origin/destination pair, with a timestamp of when it becomes available to process. A destination can be a coal terminal, domestic user and/or a non-coal traffic exit of the network.

The input for demand is based on the contracted TSEs. Contracted TSEs, which are expressed as per 30-day month, are scaled and adjusted according to the number of days in each month. The adjustment of contracted TSEs to the demand input TSEs is calculated as follows:

$$\textbf{Monthly Demand TSEs} = \mathbf{2} \times \textbf{round} \left(\frac{\textbf{Contract TSEs per 30 day month} \times \textbf{days in month}}{\mathbf{2} \times \mathbf{30}}\right)$$

The Model determines the priority of rail jobs from the demand input using one of two methods: even railings or campaign railings. The method the Model applies is determined by the mode of operation of the relevant coal export terminal/destination.

5.2.1. Even Railings:

- Applies to rail jobs with the destination of NQXT, HPCT, RGTCT, WICET; domestic users and non-coal traffic destinations;
- The list of rail jobs for all terminals excluding DBCT consists of single train cycle orders;
- Each rail job's priority is the percentage satisfaction of its contract up to that point in the list;

- rail jobs are not restricted within the month, rather they are available to rail at any time. In this way the intended even railing pattern is targeted by the prioritisation while allowing the use of sprint capacity in some parts of a month to compensate for maintenance in other parts.

5.2.2. Campaign Railings (including variable cargo assembly):

- Can be applied to terminals requiring cargo assembly (currently only DBCT).
- Without modelling the terminal's internal operation, a dynamic Ship Arrival Table (SAT) is generated from the expected tonnes carried by each mine/terminal contract. The expected tonnes consider light loading and all other loading considerations as well as historical shipping cargo size information. Based on the SAT, rail jobs are created for each shipping cargo by dividing each parcel by expected payload to convert each shipping cargo into the number of train paths required (the last parcel for each month is adjusted such that rail jobs are the same as contracted TSE's).

In systems where both methods apply (currently only the Goonyella System), the two methods are each used to assign rail jobs across a series of six-day periods within each month for the respective terminal volumes. The six-day period allows five days from first train dispatch to last train dispatch and one day for the final train to return to the terminal. The two methods are then merged and sequenced by the rail jobs' priorities. This approach is used to ensure that one terminal or railing mode is not prioritised over another.

When the Model is used to test the ability of the network to meet committed capacity within a month, at the end of each month any pending rail jobs (i.e., the train is not dispatched prior to month end), are removed, and may no longer be railed for. Jobs are considered railed within a month so long as the train is dispatched within that month.

5.3. Cross-System Traffic

Cross-system traffic is included in the Model and demand profile. Cross-system traffic includes any origin that is in one coal system and delivers to a destination in a different coal system. GAPE System train services are not considered as cross-system traffic as outlined in UT5.

There are only a handful of contractual cross-system origin-destination routes which operate in the Blackwater and Goonyella systems.

6. Train Loadouts

6.1. Overview

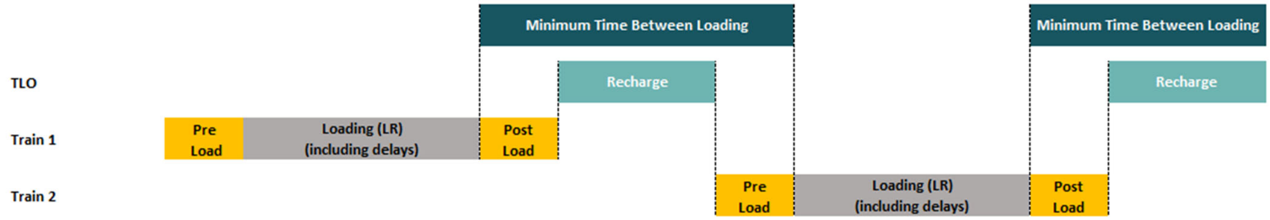
The upstream boundaries of the Model are the TLO facilities at each mine, with their associated balloon loop. Coal enters the Model at these facilities. Coal is considered always available subject to the constraints of the load point capability. In the Model, the duration that trains spend in the balloon loops is based on the following components and conditions of the use of TLOs, including:

- Access to the TLO facility, regulated by:
  - how many trains the balloon loop can hold (see ***Section 6.2 - Balloon Loop Capacities***) – this determines whether trains can queue for loading at the TLO in the balloon loop, or on the network in a passing loop; and
  - the availability of the TLO itself, allowing for planned maintenance (see ***Section 6.3 - TLO Availability***).
- The duration that each train spends at the TLO, determined from the parameters of train loading:
  - the duration of other activities such as pre and post-load activities;
  - the train payloads (see ***Section 6.4 - Payloads*****);**
  - the equipment Loading Rates (LR), which include the effect of unplanned delays to both the loading equipment and the operations immediately beyond the TLOs (see ***Section 6.5 - TLO Load Rates (including unplanned delays)***); and
  - the minimum separation time between loading of trains, including the time taken for loading equipment to be ready for their next job, i.e., recharge.
- Cycle-related activities such as crew changes, as applicable for the origin-destination pair.
- The duration that trains spend waiting for access back on to the network, which is dependent on the state of local network traffic.

The sequence of events that a train undergoes upon arrival at a TLO is summarised below, and shown graphically in **Figure 7:**

- The TLO becomes ready to load after the minimum time between loading duration has passed, following completion of loading of the previous train. **Appendix F: Train Loadout Parameters** has the TLO dispatch separation times which reflect the minimum time between loading;
- The train becomes ready to load after the pre-load duration of seven minutes. The pre-load duration is allowed to occur in parallel with the minimum time between loading;
- The train is loaded by the TLO, with the train loading duration being based on payload and load rate values. The Model samples a distribution representing train payload, and a second distribution representing load rate, and then calculates load duration by dividing the sampled payload bythe sampled load rate; and
- On completion of loading, the following two activities commence in parallel:
  - the train must wait a post-load duration of eight minutes before it can try to move out of the balloon loop to access the network; and
  - the TLO begins its minimum time between loading in preparation for loading the next train.

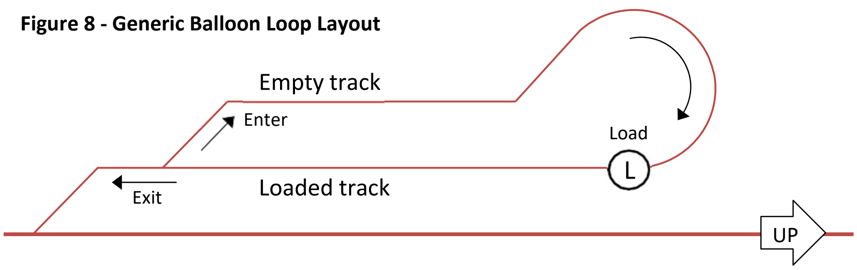
Figure 7 - Chart for choke feeding of TLO



6.2. Balloon Loop Capacities

The infrastructure properties of balloon loops differ between mines, with consequences for the queueing of trains for TLO access. **Figure 8** shows a typical balloon loop arrangement.

Figure 8 - Generic Balloon Loop Layout



The following configurations have been identified across the CQCN:

- For some mines, trains have to queue on the network if the TLO is in use and wait until the currently loading train has exited the balloon loop;
- Some mines can accept an empty train while the loaded train is still in the balloon loop, but only once the loaded train has had its loading completed;
- Some mines can accept the next train into the balloon loop while the previous train is still loading; and
- Some mines can queue more than one train in the balloon loop before the loaded train must exit.

In all these cases, the already loaded train must move off the loaded track and exit the balloon loop before the next train can commence its loading phase.

The maximum number of trains in a balloon loop used by the Model is shown in **Appendix F1 TLO Balloon Loop Capacities (Model Inputs)**. For TLO's which can hold one full train while another is being loaded these have been shown as two train capacity in the Model. Loop capacity is not merely based on the physical dimensions of the balloon loop, but also considers the location of signalling and AN's operating practices.

6.3. TLO Availability

The availability of the TLOs can be limited due to maintenance of the train loading system.

As in previous years, CNCC did not seek TLO maintenance information directly from producers due to the variability in the availability of long-term TLO maintenance plans across producers. Instead, CNCC has customarily relied on examination of historical records of TLO maintenance.

Regular periodic TLO maintenance outside of network closures has typically ranged from 4,000 to 4,250 hours cross the CQCN. The assessment of 2024 showed a similar maintenance level.

Several stakeholders had provided forecast FY26 TLO maintenance schedules to AN or directly to CNCC. From this information, CNCC identified a small number of longer shutdowns (greater than 48 hours) outside network closures. These longer shutdowns, although sporadic, were evident in historical data and often aligned with individual inloader shutdowns (as distinct from network shutdowns), thus reducing their impact on DNC.

For ACAR25, CNCC used a program of regular periodic maintenance at each TLO, similar to the approach used from ICAR to ACAR24, with amendments reflecting actual scheduled FY26 maintenance forecasts. Longer shutdowns were included only if they occurred on a regular, predicable basis. The inclusion of these shutdowns increased the total ACAR25 TLO maintenance hours to 4,845 hours.

The application of shorter regular periodic TLO planned maintenance events in the Model were applied independently of integrated closures, and at regular intervals, with equal duration for each occurrence. To avoid the unrealistic alignment of maintenance events across TLOs, a random time offset was added for the first event on each mine. TLO maintenance times were then reviewed to ensure that they did not coincide with integrated closure events.

For TLOs with no planned maintenance, it is assumed that maintenance occurs only during integrated closures, and no additional maintenance time outside of those events was included in the Model.

6.4. Payloads

As per previous years, payload parameters are determined based on analysis of data provided by above rail operators. Changes to the current payload assumptions are only considered where the comparative analysis highlighted variation of more than 5% compared to last year’s assessment.

Payload data was evaluated to determine full payload, light payload and the probability that a light load event could occur. In the Model a test is performed every time a train presents at a TLO to determine whether the payload will be a light load or a full load. The payload is then sampled from the corresponding distribution.

Payloads are considered light if values fall below a specified threshold for each system (with adjustments for routes to restricted loading or unloading locations). The payload analysis fits probability distributions for each TLO on a system by system-basis (i.e. a single TLO going to two different systems will have two sets of payload information). For TLOs without sufficient data to determine a statistically reliable sample size, prior year payload information is used.

For ACAR25 the payload analysis determined that:

- Full payload:
  - Minimal variances were observed in the expected full payload outcomes, staying within one to two percent of last year values. As a result, prior year distributions have been retained.
- Light payload:
  - the best fit probability distribution parameters were adjusted for 10 TLO destination combinations, with variances showing both increases and decreases in expected light payload values;
  - However, the probability of light loads varied by more than 5% for 26 TLO destination combinations, with most experiencing an increased likelihood of light loading events.

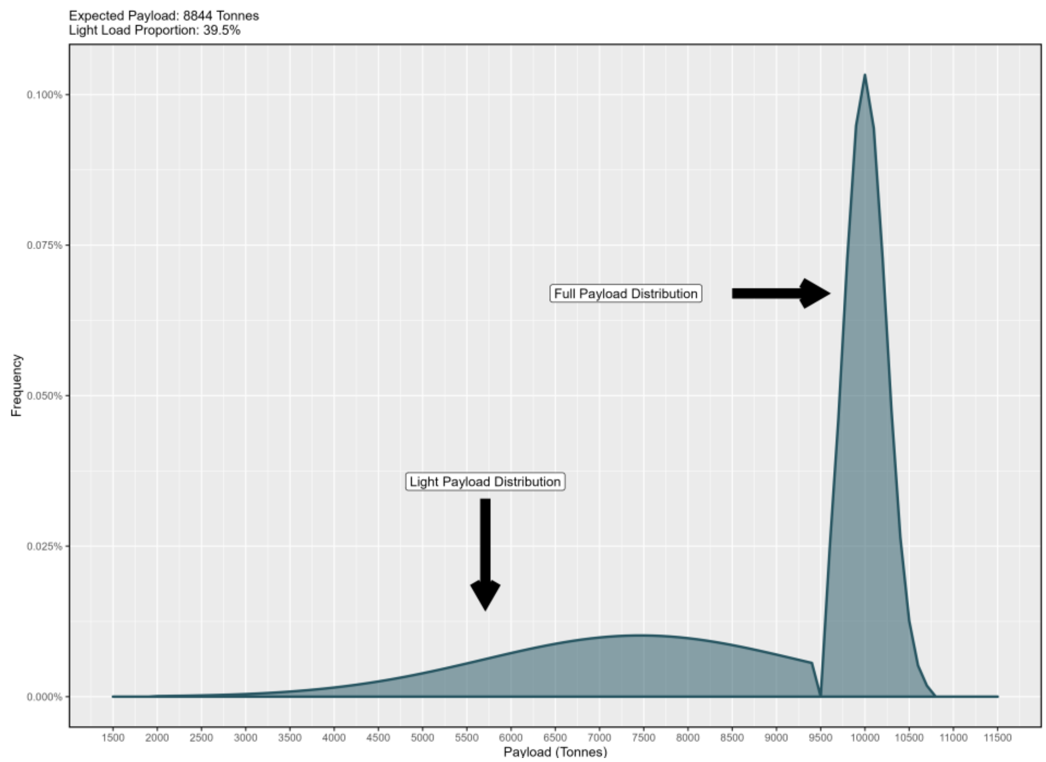
Table 7 summarises the relevant light loading threshold and average system light loading probability.

Table 7 - Light Loading by Coal System

System	Light Load Threshold (tonnes)	ACAR24 Chance of Light Load (%)	ACAR25 Chance of Light Load (%)
Newlands-GAPE	6,000	10.8%	11.8%
Goonyella	9,500	16.9%	21.4%
Blackwater	7,000	9.2%	7.9%
Moura	7,000	11.3%	25.0%
Moura short trains			
• 58 wagon trains	4,500		
• 70 wagon trains	5,100		

An example of a payload histogram and fitted distribution for an unidentified TLO is shown in **Figure 9**.

Figure 9 - Example of a distribution fitted to historical full payload and light payload for a Goonyella System TLO



6.5. TLO Load Rates (including Unplanned Delays)

Similar to the assessment of payload parameters, TLO load rates are determined using data provided by above rail operators. Changes to current model assumptions are only considered where the statistical data analysis highlighted differences of more than 5% in expected values compared to the prior year's performance.

The LR for each TLO was calculated by dividing actual payload by the difference between start and end loading times.

$$\boldsymbol{Load\ Time = Loading\ Complete - Loading\ Commence}$$

$$\boldsymbol{Load\ Rate\ (including\ unplanned\ delays) = \frac{Train\ Payload}{(Load\ Time)}}$$

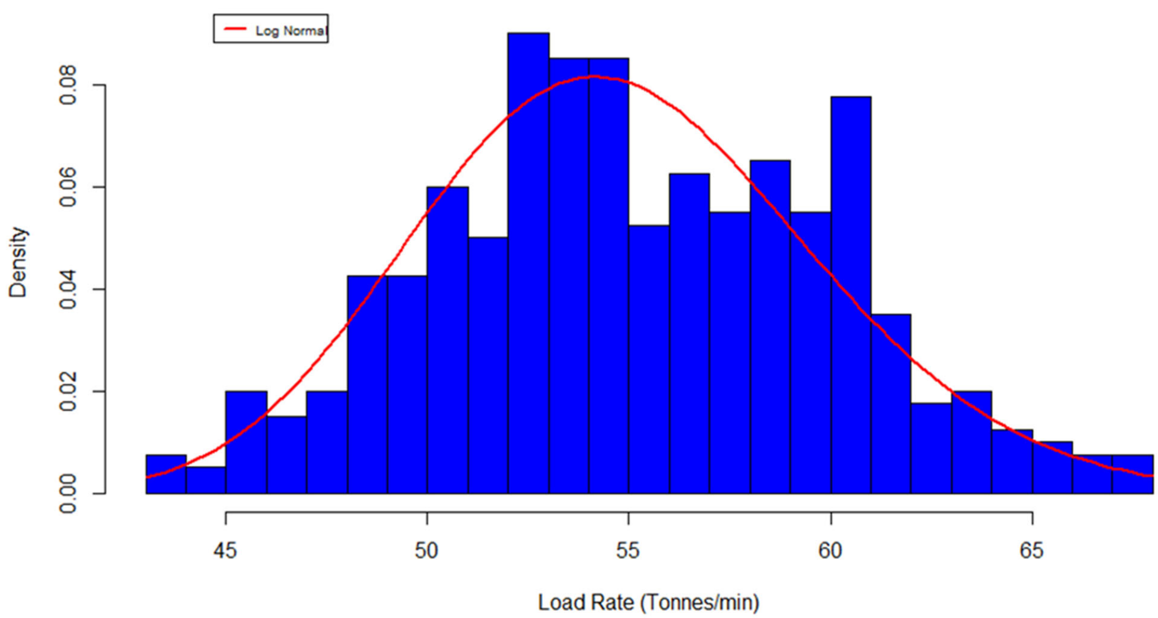
The data for each TLO was fitted to statistical probability distributions. For ACAR25, a change to the "best fit" distribution type was observed for nine TLOs where the probability parameters were updated. Observations on the expected load rate performance based on the 2024 data resulted in:

- 31 TLOs LR varied within 0-5%.
- 9 TLOs LR varied within the range of 5% to 10%.

The LR captures any delays that occur during loading, removing the need to explicitly model specific delay events on loading of trains. This does not capture any delays to the start of loading.

An example of a LR histogram and fitted distribution for an unidentified TLO is shown in **Figure 10.**

Figure 10 - Example LR histogram and fitted distribution for a single TLO



Appendix F: Train Loadout Parameters contains data used within the Model for each TLO modelled, including load time, load rate (including unplanned delays), planned maintenance outside ICs, light loading assumptions, and pre and post load times.

7. Inloaders

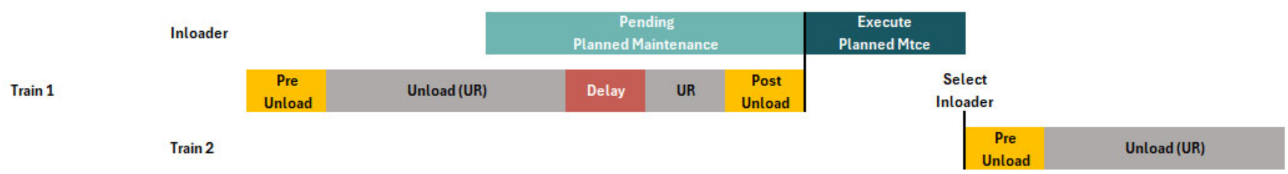
7.1. Overview

The downstream boundaries of the Model are the Rail Receival Stations (RRS), or inloaders, at each export terminal and domestic user facility. Coal exits the Model at these facilities. To model the duration that trains spend in the unloading balloon loops, the following components and conditions of the use of inloaders are captured:

- The availability of the inloaders for trains to enter, allowing for planned maintenance;
- The duration that trains spend at the inloaders, allowing for:
  - the duration of activities such as pre and post unload;
  - the train payloads;
  - the equipment Unloading Rates (UR) (excluding unplanned delays);
  - the effect of delays stemming from both the unloading equipment and the operations immediately beyond the inloaders.
- Availability of network infrastructure for trains to leave the inloaders and return to maintenance/dispatch locations.

The modelled sequence of activities in the unloading process is illustrated in **Figure 11.**

Figure 11 - Gantt Chart for Unloading of Trains



At terminals with multiple inloaders, loaded trains arriving at the terminal are placed in a queue awaiting an available Inloader. Loaded trains are only allocated to an available Inloader when the next one becomes available. Inloaders serve trains on a first-come first-served basis.

Once allocated an Inloader, the train moves to the Inloader, waits for the pre-unload delay duration, and begins unloading its payload at a sampled unload rate.

Appendix G: Inloader Parameters shows the pre and post load times for each terminal used in the Model.

Data has been sourced from each terminal which provides details of unscheduled delay events and allows for the direct calculation of unscheduled delays (both the length and frequency) without any assumption of delays beyond the inloader. These are reflected in the Model as additional failure events (based on operating time) that represent the unplanned delays in the unloading process (see **Section 7.3 - Inloader Availability**)**.** After unloading, the train waits for the post-unload delay duration and is then ready to depart for its next task. The train may potentially have to wait for the network to become available to leave the Inloader departure track.

At the completion of post-unload, the inloader becomes available for selection by the next train waiting to unload, or for completing pending planned maintenance. However, the next train can only commence unloading once the departure track has been vacated.

At RGTCT there have historically been operating practices and/or restrictions that applied, reducing the flexibility of the inloaders to serve all origin mines. These restrictions were previously included in the Model. In consultation with the terminal, the Model restrictions have been reviewed for ACAR25 and given that mines previously subject to restrictions have alternative stockpile locations (albeit limited), these restrictions have been removed from the Model.

7.2. Inloading Loop Capacities

Inloader balloon loops are assumed to possess one arrival track and one departure track each, which are both used during the unloading process. Each loop can only hold one train with the exception of [redacted]

7.3. Inloader Availability

The availability of the terminal inloaders is constrained by planned maintenance of the inloading system, and additionally by unplanned outages during operating time. For terminals with multiple inloaders, the Model treats each Inloader separately.

7.3.1. Planned Maintenance

In ACAR25 the approach adopted contemplates the potential for planned terminal maintenance to occur outside of AN track closures (FSS).

In consultation with the terminal operators and/or owners, a forward view of anticipated maintenance activities for each terminal from FY26 till FY30 period was reviewed. Planned maintenance activities were compared with the planned FSS to determine the expected level of maintenance outside of FSS events. Where possible, the start date of inloader maintenance events is adjusted to maximise alignment with FSS events, but inloader outages may be scheduled such that they:

- Are within the FSS;
- Overlap with the FSS (start earlier and/or end later than the comparable FSS); or
- Are outside of the FSS.

This data has been adjusted in consultation with the terminals to reflect the potential to refine maintenance plans as demand increases, to mitigate where possible any impacts on coal throughput.

When a specific Inloader undergoes planned maintenance, it is not available for selection by arriving trains. If a train is currently being unloaded at the scheduled start time of a planned maintenance event, the unloading process is allowed to finish first (see **Figure 11**).

7.3.2. Unplanned Maintenance

Unplanned outages are modelled as randomised delay events during the unloading process, during which a train still occupies the inloader, but no unloading takes place. These delays are applied using a Time-to-Failure (TTF) and a Time-to-Repair (TTR), which are sampled from distributions for each Inloader. These distributions have been derived from recent historical unloading duration data received from export terminals.

A review of historical unloading events was undertaken and any event that overlapped with another delay event was identified and removed. The remaining data was used to derive the required TTF and TTR parameters for each terminal inloader.

Unplanned maintenance performance for most terminals was comparable with ACAR24 unplanned maintenance.

7.3.3. Pre and Post Unload Delays

Some terminals supplied data that provided sufficient detail to determine the pre and post load times from actual data and these are applied in the Model. For other terminals, the pre and post load times have been assumed to remain at seven and eight minutes respectively.

7.4. Inloader Unload Rates

Train unloading job data was provided by coal terminals and above rail operators for the calendar year 2024 and combined with previous historical data. The data contained unload information and unplanned delay data.

The unload rate for each Inloader was calculated by dividing actual payload by the unload time using the start and end unloading times.

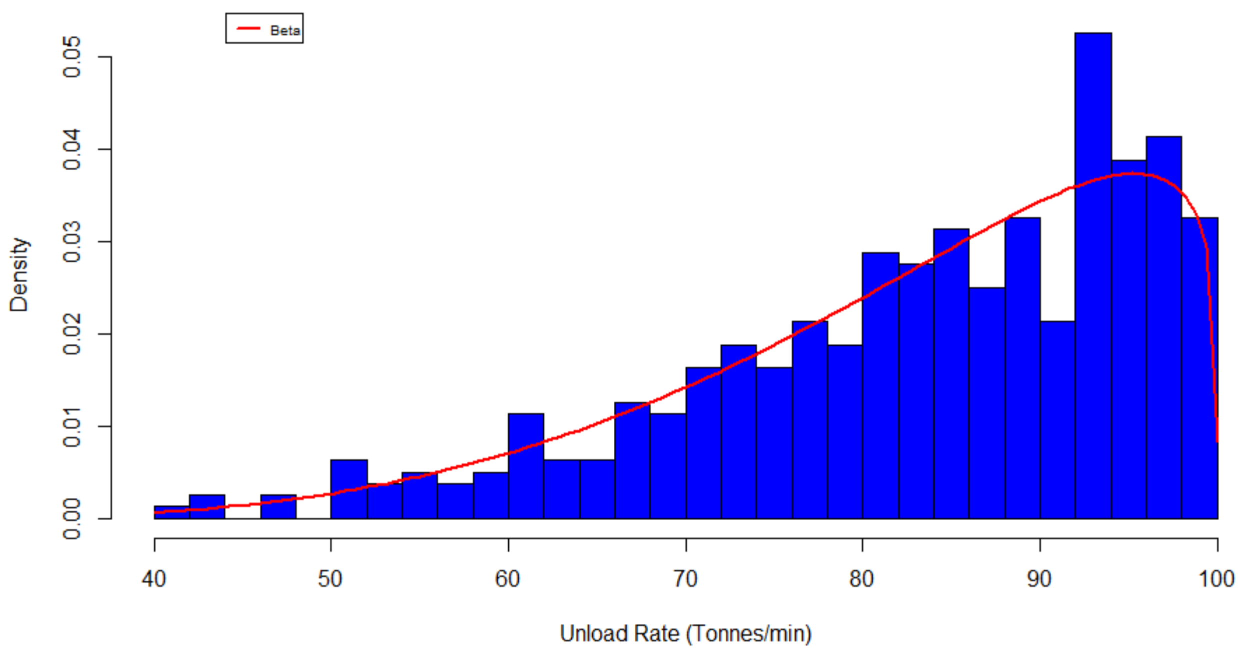
$$\textit{Unload Rate (excluding unplanned delays)} = \frac{\textit{Train Payload}}{\textit{Unload Time}}$$

The data for each Inloader was then fitted to probability distributions which are used by the Model.

The typical spread of UR is illustrated in the example in **Figure 12**. The majority of unload jobs complete at a rate close to equipment capability, with some variability due to downstream activities and individual attributes of a train load, e.g., sticky coal, free-flowing coal etc.

Data from one terminal operator showed an increase in long unload delays, which have been included in the ACAR25 inputs. This adjustment has a minor impact on the modelled DNC and leads to a slight degradation in mini cycle duration. This could be attributed to more frequent occurrences of long unload durations. Other terminals' data was comparable with ACAR24 unload rates.

Figure 12 - Example Terminal Unload Rate Distribution



7.5. Inloader Data

Appendix G: Inloader Parameters contains data used within the Model for each inloader modelled including unload time, UR, planned maintenance outside FSS, time at terminal and pre and post unload times.

8. Below Rail Operations

This section describes how the Model captures the way in which the coal systems operate in practice. The Model does not explicitly copy real world operations step by step. For instance, the Model does not generate a train plan, however, instead, the Model captures how the end result of the real-world operations planning process plays out.

8.1. Pathing

Previous ACAR exercises included the use of clockface departures in both the empty and loaded directions, consistent with AN's published pathing schedule.

For ACAR25 a study has been compiled on pathing and dispatch separation to determine whether clockface departures on the loaded leg are being adhered to. The data highlighted no alignment to loaded clockface departure is occurring in the CQCN in practice. As a result, this constraint has been removed for the ACAR25 assessment.

For reference, the clockface pathing separation has not changed from ACAR24 to ACAR25 however clockface pathing is no longer adhered to in ACAR25.

Table 8 - Path Frequencies

Coal system	Mainline Path	Clock Face Adherence	Separation (minutes)
Newlands-GAPE	ex Pring, empty	Yes	45
	ex Collinsville, loaded	No	Determined by model logic
Goonyella	ex Jilalan, empty	Yes	20
	ex Coppabella, loaded	No	Determined by model logic
Blackwater	ex Callemondah, empty	Yes	15
	ex Kabra, empty	Yes	
	ex Bluff, loaded	No	Determined by model logic
	ex Rocklands, loaded	No	
Moura	ex Callemondah, empty	Yes	90
	ex Dumgree, loaded	No	Determined by model logic

In contrast to mainline sections of track, travel on branch lines is not path-controlled, but instead governed by headway and track booking requirements. This means that trains do not need to wait for a clock-face path to travel from a mainline turn-off to the loadout balloon loop. Trains leave balloon loops after they have finished loading, and travel run-when-ready to the relevant terminal governed only by the Model's track booking logic.

8.2. Dispatch

In the real-world operation of the CQCN, railing is planned with weeks of look-ahead in a complex vertically separated planning regime designed to coordinate between numerous Access Holders and service providers. These plans are then implemented and adjusted in day of operations management.

The Model does not attempt to replicate this process and its various actors with their individual objectives and constraints. Instead, it aims to capture the outcome of a successful planning process through the modelled dispatching algorithm. The dispatching algorithm decides how rail jobs are assigned to available trains.

Rail jobs are generated from the demand described in **Section 5 - Demand.**

For each idle train arriving at a dispatch location, the list of available rail jobs is searched in order until one is found that satisfies the following criteria:

- There is outstanding demand to rail remaining in the rail job;
- The rail job's TLO is available at the expected time of the train's arrival, in particular:
  - The maximum number of trains per day dispatched to the TLO has not been reached;
  - The maximum number of simultaneous trains on the way to the TLO has not been reached;
  - The maximum number of simultaneous trains already dispatched to the relevant terminal has not been reached (applicable only to the Goonyella System due to the proximity of the two terminals);
  - The estimated loading period is not expected to clash with another train;
  - The TLO is not undergoing planned maintenance;
- The selected train is suitable for railing between the mine and terminal in question. This takes into account both above rail contracts and physical constraints; and
- The train's journey to the loadout is not expected to be interrupted by network closures or planned maintenance.

If a rail job has been found that passes all of the above checks, the train is assigned to be dispatched to the respective mine for delivery to the respective terminal. It then embarks on the first step of its train cycle task sequence (see ***Section 9.2 - Train Cycles***). Typically, this involves requesting a path for mainline travel.

If no rail job is found for a given train, the search for a matching train job for the next train commences.

8.3. Rail Microsimulation

The travel of trains between points on the network is handled by the Model's rail microsimulation engine. This engine monitors and directs the movement of trains over tracks, respecting the following principles:

- **Train routing**: The rail microsimulation engine chooses the route from each train's current location to the next task in the current train cycle. The travel of the train along the chosen route is controlled in increments that depend on the current network status;
- **Plan and execute train movements**: For each train movement along a route, a sequence of tracks is chosen and booked to the next "safe to stop" section. For dual track sections, the rail microsimulation engine has a designated "preferred" track for both empty and loaded travel. When the sequence of bookings is made, the train travels along the booked sequence of tracks, with the rail engine monitoring its progress and applying travel-related events (such as delays, see ***Section 10 - System Delays***) until the train reaches the last booked track. This process is repeated until the train reaches the destination of its route; and
- **Negotiation of train meets to avoid deadlocks**: the track booking algorithm is designed to manage the meeting of trains on a local scale, employing a first-come first-served approach. It considers track availability and usage by other trains at the time of booking in a way that ensures that trains only stop in locations where oncoming traffic is able to go around them.

8.4. Track Maintenance

The IE receives information from AN regarding historical and future CQCN track maintenance activities, which is used in the preparation of maintenance-related Model inputs. This information includes:

- integrated closures and major planned maintenance as agreed with the Rail Industry Group for FY26 via AN's Maintenance Renewal and Strategy Budget (MRSB) process;
- actual maintenance possessions during CY2024; and

- information regarding non-coal traffic movements, which includes movements of maintenance-related traffic

8.4.1. Possession-Based Maintenance

The majority of AN's track maintenance activities are represented in the data by track possessions which are temporary closures and/or occupation by AN on part of the rail infrastructure for the purposes of carrying out work on or in the proximity of the rail infrastructure.

In real-life operations, only part of the possessions for a financial year are known ahead of its start. Additional possessions are added as the need for works on specific assets arises. In the Model, the look-ahead for train dispatch and running is short enough that both long and short term planned possessions can be assumed to be known at the time needed, therefore they are all included in the maintenance calendar.

Where possessions occur on one track in a duplicated section, the Model allows the remaining track to be occupied for both up and down traffic. In the Model, planned track maintenance events will commence whether a train is on that section of track or not. If a train is occupying the track, the Model allows it to move off. After that, the Model does not allow another train to occupy the section of track until the planned maintenance activity is complete.

There are three types of possession-based track maintenance activities that are considered in the forward maintenance schedule within the Model:

1. Integrated closures (IC) - FSS and branch line shuts which are included in the MRSB scope;
2. Major Maintenance - maintenance and renewal tasks included in the MRSB program, excluding integrated closures; and
3. Minor Maintenance - smaller-scale maintenance activities (excluding emergency maintenance).

8.4.2. Integrated Closures

Integrated closures refer to those periods of track possession in which a whole system is closed for maintenance (FSS) or one or more branch lines are closed to rail traffic (branch line shutdowns).

Integrated closures are for pre-planned periods with the duration of such events ranging from 24 to 108 hours at a time. During integrated closures, trains are typically stowed at rail depots, balloon loops, and other parts of the network. The exact planning of locations and timing depends on the works of the individual closure.

Model assumptions regarding integrated closures for future years are based on the industry approved MRSB scope.

Integrated closures are modelled as planned maintenance events that stop the travel of trains and the dispatch of train services to the mines impacted by the integrated closure. CNCC has implemented the 24 hour "maintenance windows" planned for the Newlands and Moura systems as integrated closures.

For FSS, all inloaders of all terminals in the respective coal system are made unavailable for the duration of the closure. In Blackwater, if there is an FSS that does not impact common infrastructure utilised by Moura, then Moura will be able to continue to operate. Similarly, in Goonyella, if there is an FSS that affects DBCT and HPCT but does not affect certain branch lines, GAPE trains can continue to service accessible mines.

The implementation of stowage and the related staggered shutdown and restart of operations is described in **Section 9.4 - Stowage.**

8.4.2.1. *Major Maintenance*

Major maintenance are maintenance tasks included in the MRSB scope but which occur outside of integrated closures periods, and are accommodated within less extensive possessions, including single-line closures within duplicated track sections.

Model assumptions regarding major maintenance for future years are based on the industry approved MRSB scope.

8.4.2.2. *Minor Maintenance*

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

As minor maintenance activities are often not known well in advance, historical data on below rail maintenance activities is analysed to understand the expected future minor maintenance profile. 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.

In determining minor maintenance possessions, maintenance activities that occur in the shadow of integrated closures and major maintenance possessions are excluded. The average actual hours of the last four years (2021 to 2024) is used to determine the minor maintenance possessions for each work type and system. 2020 was excluded from this average as it was a low maintenance year.

Furthermore, a scaling factor has been added to those maintenance activities identified as tonnage dependent.

8.4.3. Moving Maintenance

In previous capacity assessments, the Model has not included "moving maintenance" activities – those maintenance activities that do not involve track possessions, but rather are implemented as rail traffic moving slower than coal trains.

In response to feedback received from stakeholders following the publication of ACAR24, CNCC has conducted further analysis on moving maintenance activities.

From discussion with AN subject matter experts, it was identified that the two most prominent examples of this are mainline rail grinding and mainline rail resurfacing.

These activities were not incorporated into previous ACAR models as advice from AN had been that such activities are scheduled around coal services but is now clear that rail grinding in particular is scheduled in the train plan prior to any other rail traffic or maintenance activities and as such its capacity impacts have not been adequately captured within the Model.

For ACAR25, CNCC has representing the impacts of rail grinding conducted on each system's trunk (i.e. the mainline and branch lines across which the majority of system traffic travels). An examination of resurfacing activities and their impacts has been deferred until a subsequent capacity assessment exercise.

Data for the activities of the rail grinding machine was obtained, including the time spent actively grinding track in each section of the CQCN. The intensity of rail grinding requirement is driven primarily by the tonnage of rail traffic across each track section and the degree of curvature of each section. The rail grinding requirement drives the frequency and duration of rail grinding events in each track section. By way of example, rail grinding of the "Up" track which carries loaded coal traffic down Connors Range in the Goonyella System currently occurs every 6-7 weeks.

Data on grinding in each system's mainline/trunk track sections between FY21-24 was assessed to obtain the frequency and duration of rail grinding requirements at recent historical volumes. The rail grinding requirement was then scaled to represent the frequency of rail grinding required at full contractual volume (for Newlands-GAPE this was adjusted to use an estimate of DNC).

Sectional rail grinding activities were then aggregated into grinding tasks each approximating the aggregate rail grinding achievable in one day (approximately 200 mins per day based on historical data). These grinding tasks were adjusted for non-grinding time (approximately 50% in addition) and aggregated into multi-day packages consistent with the required frequency.

For modelling purposes, the track occupancy represented by these grinding activities was converted into maintenance possessions and implemented in the model.

Table 9 - Rail Grinding by System

Coal System	Frequency (times per year)	Average Duration (minutes)	Annual Duration (hours)	Annual Section Occupancy (hours)
Newlands-GAPE	2 - 4	51	85	128
Goonyella	8 - 10	60	292	438
Blackwater	2 - 5	58	228	343
Moura	1 - 2	86	18	28

8.4.4. Infrastructure Inspection/Hi-Rail Movements

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. Approximately 80% of recorded hi-rail vehicle movements are for regularly scheduled inspections – known colloquially as "road patrols", with the remaining movements understood to be associated with ad-hoc maintenance activities.

In prior ACARs, all hi-rail movements from the prior year's sample period were replicated in the model as a series of short track possessions, except the sections when a delay attributed to track maintenance activities were recorded. A review of data for ACAR25 suggests that many regular inspection activities may have been erroneously excluded based on this criterion, so the approach to infrastructure inspection was revised.

Records of non-coal traffic was filtered for records with the "Train Type" field value of "HIRAIL30" (representing hi-rail vehicles travelling at 30 km/h). From this data, regularly scheduled inspections were evident in each system of the CQCN and identified the pattern of regular infrastructure inspection conducted via hi-rail vehicles (the aforementioned "road patrols"). These appear to occur at least every two weeks on every section of the CQCN. CNCC understands that these movements are scheduled prior to coal traffic and, as such, result in the removal of coal traffic paths (described generally as "maintenance" but recorded by AN as "TEST CARS").

An examination of AN's pathing records was made to compare this data with paths removed under the description "Maintenance – Rail Cars". These records aligned closely with the dates and durations of the non-coal traffic data described above.

For ACAR25, CNCC has included each of these scheduled infrastructure inspections, based on the observed patterns, as a series of short track possessions when the hi-rail is scheduled to be on each track section.

Table 10 - Infrastructure Inspection - Hi-Rail Movements

coal system	Route	Frequency (every x weeks)	Inspection Duration (hours)	Annual Duration (hours)
Newlands-GAPE	Abbot Point - Collinsville	2	3	65
	Collinsville - Abbot Point	2	4	91
	Briaba - Havilah	2	4	91
	Havilah - Briaba	2	4	91
	Cockool - North Goonyella Junction	2	4	104
	North Goonyella Junction - Cockool	2	5	117
Total				**559**
Goonyella	Yukan - Ports - Yukan	2	5	130
	Yukan - South Walker Junction	2	4	104
	South Walker Junction - Yukan	2	3	65
	South Walker Junction - North Goonyella Junction	2	4	104
	North Goonyella Junction - South Walker Junction	2	3	78
	Moranbah - Blair Athol - Wotonga	2	3	78
	Coppabella - Dysart	2	4	104
	Dysart - Coppabella	2	3	78
	Saraji - Oaky Creek	2	2	52
Total				**793**
Blackwater	Rangal - Fairhill	1	1	52
	Rocklands - Callemondah	1	3	156
	Ports - East End - Ports	1	2	104
	Midgee - Dingo	2	5	117
	Dingo - Midgee	2	1	26
	Rangal - Rolleston - Rangal	2	4	91
	Rangal - Duaringa	2	1	26
	Burngrove - Oaky Creek - Burngrove	2	4	104
	Dingo - Burngrove	2	3	65
	Mt Miller - Rocklands	2	3	65
Total				**806**
Moura	Dumgree - Callide - Dumgree	1	3	130
	Earlsfield - Callemondah	2	2	52
	Earlsfield - Callide	2	2	39
	Graham - Earlsfield	2	3	78
	Callemondah - Stowe	2	1	13
Total				**312**

The transport of materials and work trains is not considered in the Model as in practice, it is typical for moving equipment to be scheduled around coal and other services.

The anticipated maintenance for each year of the capacity period for each coal system, mainline and branch line and per type of maintenance is summarised in **Appendix B: Below Rail Maintenance.**

9. Above Rail Operations

9.1. Consists and Fleets

Assumptions are made for the number and type of trains available in each coal system to reflect the expected fleet sizes required to meet the demand. This may differ from the amount allocated by each above rail operator to meet their rail haulage contracts. A consist type is applied to each origin/destination as per historical data (CY2024).

Train consists are classified as either diesel or electric. Diesel consists can access the whole CQCN while electric consists can only access the electrified parts of the CQCN, see **Section 4.3 - Electrification.** Diesel and electric locomotives have different maintenance and provisioning requirements.

Consist lengths, and hence payloads, also vary from coal system to coal system, and also within a given coal system. Consist length is not considered directly in the Model however is accounted for through the varying origin/destination groupings and relevant above rail operators. The Model determines payloads for TLO related activities based on historical data, as described in **Section 6.4 - Payloads.**

Consists are grouped into fleets based on their above rail operator, their motive power, the coal system they are based in (as defined by the terminals they service), and the depot where they are maintained and provisioned.

The Model does not include the temporary transfer of consists of one coal system's fleet to another to accommodate demand fluctuations between coal systems. All consists stay based in the coal system they are defined in while allowing travel between coal systems. For example, Blackwater System-based consists can travel to Goonyella System TLOs for haulage to Gladstone Port, but they do not load at a Blackwater or Goonyella systems TLO for haulage to the Port of Hay Point. Further, it is assumed that Moura System fleet consists service only the Moura System TLOs.

When assessing the DNC, capacity should not be constrained by the current number of consists (as DNC is a measure of maximum number of train paths for the rail infrastructure), and so the consist number is artificially inflated, under the assumption that the above rail operators will provide the consists needed to realise the DNC. When inflating the consist numbers to increase the DNC, the trade-off between incremental throughput and transit time (defined as cycle time excluding loading and unloading time) is assessed to determine the optimal number of consists. Additional consists are introduced incrementally for each system until an inflection point in the balance between throughput and transit time is reached.

As CNCC does not hold information regarding rail haulage contracts, CNCC's train reporting data for was examined to see whether significant change could be observed compared with ACAR24.

Where more than 80% of a mine's production in a given system was hauled by a single rail operator, that rail operator is established as the only rail operator for that mine/system combination in the model. Where less than 80% was hauled by a single rail operator, multiple rail operators are established for that mine/system combination in the model. There was one exception due to mine ownership changes.

For ACAR25, 12 mine/system combinations were modified. One further modification was made to acknowledge [redacted]

9.2. Train Cycles

In general, train cycles typically proceed as follows:

- Dispatch from depot (Pring, BRC, Jilalan, Nebo, Callemondah);
- Travel empty to TLO;
- Load at TLO;

- Travel loaded to Inloader;
- Unload; and
- Travel empty to depot for possible provisioning and/or maintenance, then dispatch.

Exceptions to the typical train cycles are described in **Section 9.3 - Non-standard Cycles.**

Throughout train cycles, consists obey all necessary pathing and separation rules relevant to their network locations.

9.2.1. Planned Maintenance

Planned maintenance activities that are considered in the Model include examinations/inspections, Block Change Outs (BCO), unit train maintenance and provisioning and any shunting associated with these activities. This is based on information provided by the above rail operators. Maintenance activities are all assumed to take place at the rail depots at which the fleet is based, as per **Section 4.5 - Rail Depots.**

For ACAR25, CNCC has worked with rail operators to more clearly define which maintenance activities occur on AN track infrastructure (and therefore affect track capacity) and distinguish this from maintenance activities which happen on private track infrastructure. In the case of block change outs, the Model now only includes the time required to separate, shunt and re-constitute a consist which is substantially shorter than conducting a full maintenance activity on AN track infrastructure.

Although planned train maintenance activities are included in the model, given that DNC is largely unconstrained by above rail fleet (with additional fleet being assumed to be added), train maintenance has little impact on capacity, save for effects of these activities on yard capacity/yard congestion.

9.2.2. Crew Changes

At various stages in the train cycle, crew changes will take place. These occur most commonly at depots, TLOs and/or staging points such as Coppabella, Bluff and Kabra, but actual locations depend on the individual train cycle. All crew changes involve the application of stopping and starting time allowances and a time for the actual crew change. Crew change times are different when they occur within a depot.

ACAR25 includes some revisions to crew changes to refine the most common crew change locations for each origin-destination, where previous ACARs included all locations where crew changes could take place.

Crew change times at depots have been reduced from (generally) 30 minutes to 10 minutes, which is more aligned with the time the consist might stop to effect a crew change, rather than the longer time a crew might take to reach a train in a busy yard environment.

Appendix I: Above Rail Parameters has the detailed information on crew change times for each location.

9.3. Non-Standard Cycles

9.3.1. General

Exceptions to the standard train cycle identified in **Section 9.2 - Train Cycles** include:

[redacted]

- Trains that have unloaded at the following locations do not return to the Callemondah depot until the end of their following cycle; instead, these trains are dispatched from their unload point:
    - WICET;

- Rio Tinto Aluminium (Yarwun);
- Fisherman's Landing;
- Stanwell Powerhouse (in the Model, trains that unload at Stanwell Powerhouse then return to Bluff to be dispatched); and

[redacted]

- Most loaded trains passing through Callemondah are provisioned while loaded before unloading at RGTCT;
- There is no provisioning of trains at the WICET balloon loop or at the Stanwell Powerhouse;

[redacted]

9.4. Stowage

In actual operations, consists are stowed in suitable locations during ICs, typically rail depots, balloon loops, and on the network, as there are insufficient roads at the main rail depots to store all consists. Stowage locations are customised to the specific works of each FSS to allow a quick return to normal operation, so their planning varies between individual ICs.

Therefore, the Model does not explicitly implement stowage procedures. Instead, it simulates their effects as follows:

- Trains are not dispatched to a mine if their predicted travel to the mine will coincide with a scheduled IC. The Model assumes a minimum travel time and a multiplier of 1.5 to account for any delays;
- Already dispatched trains are allowed to travel up until the beginning of a shut, and are then stopped at strategic locations, forcing them to queue on the network. This captures the staggered restart outcome of well-organised stowage; and
- An additional look-ahead for shuts of 48 hours is applied for cross-system train services from the Newlands-GAPE System to Goonyella System mines. This is done to ensure that the trains have enough time to return from the mine, and do not become trapped due to a Newlands System shut, effectively imposing a Goonyella System IC.

10. System Delays

10.1. General Delays

At times, trains must fully stop due to breakdowns, failures and faults that occur within the supply chain.

These faults may be due to various reasons such as rollingstock defects, track defects, signal failures, telemetry failures, objects on the track, etc. These stops are recorded as delays. Several trains may be delayed by the same fault.

When considering delays in the Model, fault events need to be generated, with the Model then determining the consequential delay impact of these faults, i.e., how many trains are delayed, and for how long. That is, faults are a Model input and delays are a Model output. General delays are any delays above the assumed SRT.

AN delay data was filtered by delay code to use only those below-rail and above-rail delays that are not explicitly captured elsewhere in the Model.

For instance, Temporary Speed Restrictions (TSR) are explicitly modelled (see **Section 10.3 - Temporary Speed Restrictions**), and so delays due to TSRs were not included in the analysis.

Similarly, delays due to TLOs and inloaders were excluded, as were delays due to large force majeure events.

Faults are represented in the Model as "Track Failures" that only occur when a train is on the track and hence are a property of the track sections and the distance travelled by each train. The inputs include distributions that describe:

- the number kilometres of track section travel between faults (distance travelled between faults); and
- the duration of the faults.

ACAR25 has introduced a refined approach using AN's delay data. Previously, the analysis included a large number of delays with a very low duration, many of which were system-generated and under three minutes long, which were unlikely to significantly impact network capacity.

The updated methodology focuses on a smaller subset of major faults with longer delays that are more likely to affect capacity. This approach identifies the train responsible for the primary fault and measures its duration. The fault data then serves as input for the model, allowing it to simulate the resulting knock-on effects on network capacity. TTR has also been capped at a maximum of 1500 min per primary delay event.

Based on stakeholder feedback, Train guard implementation issues caused extended delay durations in H1 CY2024 in the Blackwater System resulting in a substantial reduction in capacity. H2 CY2024 delay data was thus used to calculate the Model parameter for the Blackwater System for ACAR25.

10.2. Crew Change Delays

Crew change delays are handled separately from other delays as they are attached to specific activities (crew changes) and their locations. Crew change delays are delays on top of the regular train crew change durations provided by the above rail operators. i.e. additional to the planned crew change times.

ACAR25 maintains the assumptions for crew change delay from ACAR24:

- a scheduled crew change has a chance of overrun of 16%; and
- a median duration of overrun of 5 minutes.

10.3. Temporary Speed Restrictions

Occasionally, circumstances will require the placement of TSRs on different track sections. When a TSR is in place, trains must travel at a slower speed across the relevant speed-restricted length, effectively adding extra time to the SRT for the relevant section. This extra time consists of:

- the time it takes the train to decelerate to the lower speed;
- the time spent travelling the restricted length at the lower speed; and
- the time it takes the train to accelerate back up to the usual speed for that section.

Data for TSRs for period from January 2022 to December 2024 has been reviewed to formulate the TSRs for inclusion in the Model. Only events with a duration of between 1 and 365 days was used. Geographic and seasonal factors impact TSR's.

To account for these factors, each track section is split into four groups based upon their total time under TSRs: no TSRs, and low, mid and high impact TSRs. Each of the three groups of sections with TSRs was given their own:

- time between TSR events on individual track sections (Time between Failures (TBF));
- duration of individual TSR events (Time to repair (TTR)); and
- time penalty applied to consists that traverse the impacted sections during the event.

Exponential distributions were then applied to the TBF and TTR data for each of the three groups of TSR's. The most appropriate distribution was then applied to the time penalty data.

TSR's were applied in the Model by month and per track section (where the historical data showed a TSR had been applied). A summary of these parameters is provided in **Table 11**.

When TSRs are applied to a double track section, there is an equal probability (1/3) of the TSR being applied to the up track, down track, or both tracks, regardless of whether the section falls into the low, mid, or high TSR group.

The review of the CY2024 data showed the following outcomes for TSRs:

- a 6% increase in track sections affected by TSRs, rising from 175 to 185 sections. High TSRs sections decreased by 4, sections with mid and low TSRs sections increased by 8 and 6, respectively.
- TSR frequency improved, with the time between events increasing by 8% (High), 20% (Mid) and 35% (Low).
- TSR durations increased across all three categories, by 9% (High), 149% (Mid) and 11% (Low).
- The overall TSR time penalty on consists travelling across each section remained consistent for low and mid TSRs compared to ACAR24, while high TSR impact per consists improved marginally (by 14%, 0.3 minutes).

Table 11 - Temporary Speed Restriction parameters

TSR Group	Description	Expected Value
Low TSR	Time Between events per section (TBF) (minutes)	158,000
	Event Duration (TTR) (minutes)	42,000
	Individual consist time penalty (minutes)	2.4
Mid TSR	Time Between events per section (TBF) (minutes)	67,000
	Event Duration (TTR) (minutes)	50,000
	Individual consist time penalty (minutes)	2.1
High TSR	Time Between events per section (TBF) (minutes)	41,000
	Event Duration (TTR) (minutes)	51,000
	Individual consist time penalty (minutes)	1.9

10.4. Cancellations

A train service can be cancelled in practice for a number of reasons and the cause of each cancellation is allocated to either above Rail, below Rail, mine or other (includes port and force majeure).

Large force majeure events such as infrequent extreme weather events that disrupt operations in part of the supply chain (e.g. cyclones) are not included in the Model and are removed from relevant data sets. These large force majeure events are not modelled. However, many smaller events that may be classified as force majeure for commercial purposes, are captured within general delay data and used in the model assumptions.

Cancellation data was reviewed for the calendar year 2024 along with previous years historical data. The data was reviewed and the status of each cancellation of each train service allocated to a cancelled status, terminated status or an arrived status. The methodology used to calculate the cancellation percentage probability is:

$$\boldsymbol{Cancellation}\ \%\ (\boldsymbol{probability}) = \frac{\boldsymbol{Cancelled} + \boldsymbol{Terminated}}{(\boldsymbol{Cancelled} + \boldsymbol{Terminated} + \boldsymbol{Arrived})}$$

A probability of cancellation of a train service at every dispatch is specified for each coal system. A cancellation is considered to occur after a train has been assigned a rail job and a dispatch path.

The consequence of a cancellation is that the train and the rail job are delayed from running again for a given duration. Cancellations are assumed to delay a particular rail job from being serviced for the separation time between paths from the dispatch location.

To derive modelled cancellation rates, cancellation data from 2022 to 2024 inclusive was reviewed and summarised by the responsible party (i.e. above rail, below rail, mine, port).

In general, Below Rail and above rail cancellations were similar in most systems, while other cancellations (which includes Force Majeure, Port and uncategorised) increased slightly for all systems.

2024 data showed a continuation of significant cancellations attributed to the code ‘Adjoining Operations Loading (Direct)’ and ‘Service Cancelled/Altered by Operator’. While some TLO functional issues and above rail operator alterations may be included here, the scale of these cancellations suggests that this code is reflective of situations where mines have no coal available for a scheduled train service. The majority of no coal cancellations are occurring at Blackwater and Moura System at 9% of all scheduled train services, followed by Goonyella System at 7%. Any ACAR estimate of network capacity is intended to occur in an environment of “full demand” for train services. In such an environment, cancellations for lack of coal should be quite rare. Thus, the IE continued to adjust cancellation rates to reflect a full demand environment and the absence of substantial “no coal” cancellations.

In ACAR25, cancellations due to exceptional weather events such as cyclones or other unusual events (e.g. major accidents, Cloudstrike global IT failure) have been excluded. This applies to all categories of cancellation (e.g. port, above rail, force majeure etc).

Table 12 - Cancellation Assumptions (model inputs)

Coal system	ACAR24 Total Cancellation (Reported)	ACAR24 Total Cancellation (Recalculated)	ACAR25 Cancellations				
			Total	Below Rail	Above rail	Mine	Other
Newlands-GAPE	13.1%	13.2%	1.4%	7.6%	2.6%	2.1%	13.7%
Newlands-GAPE Adjusted [1]	**11.8%**	**12.7%**	**1.4%**	**7.7%**	**2.3%**	**2.1%**	**13.4%**
Goonyella	19.5%	19.6%	3.3%	8.9%	5.4%	3.3%	20.9%
Goonyella Adjusted [1]	**16.0%**	**18.3%**	**3.3%**	**9.0%**	**4.2%**	**3.4%**	**19.9%**
Blackwater	19.6%	19.7%	1.8%	7.4%	9.6%	1.3%	20.0%
Blackwater Adjusted [1]	**14.0%**	**15.4%**	**1.9%**	**7.8%**	**4.7%**	**1.4%**	**15.7%**
Moura	19.8%	20.2%	2.2%	7.5%	7.8%	2.1%	19.6%
Moura Adjusted [1]	**15.2%**	**18.8%**	**2.3%**	**7.6%**	**5.5%**	**2.2%**	**17.6%**

Note: 1. Cancellation rates are adjusted to exclude the impact of cancellations due to lack of coal and excluding major disruption events
2. ACAR24 results recalculated due to arithmetic error in published results

Added Cancellations – Yard Congestion Pring

During 2024, CNCC worked with participants in the Newlands-GAPE System to examine train movement and congestion in the Pring-Abbot port mini cycle. This initiative provided the analytical basis to implement modelling of congestion in the Pring yard due to train cancellations, where trains occasionally experience long wait times because the next scheduled service is cancelled. For ACAR25, additional wait times in the yard, in the form of extended train "maintenance" activities, have been included to represent the impact of these delays for the Newlands System only.

To model the effects of long cancellation wait times in the yard, additional train "maintenance" activities have been added in the Model. In the Model after approximately 10 trips, Newlands-GAPE trains undergo a delay of 1.5 hours and after approximately 20 trips, a delay of 18 hours. The 1.5 hour delay is intended to account for the additional time spent in the yard when there are schedule changes due to cancellations. The less frequent 18-hour delays represent instances where the next scheduled train service is cancelled, and the train cannot be rescheduled to another service, resulting in the train either waiting in the depot or being staged on the network until the next available scheduled train cycle.

Implementation of this mechanism resulted in an improvement in the alignment of model results at historical volumes and observed historical yard occupancy.

11. Non-Coal Traffic

11.1. Overview

AN is obliged to provide access to non-coal traffic under access agreements, passenger priority obligation or preserved train path obligations, including the obligations under *sections 265 and 266 of the Transport Infrastructure Act, 1994 (Qld)*. AN must prioritise timetabled traffic services ahead of cyclic traffic (i.e., coal traffic, unless the unloading destination is a domestic power station).

The Model includes non-coal traffic that runs on a regular weekly schedule and is prioritised over all coal traffic. The Model does not include non-coal traffic that runs on an ad-hoc basis.

Contracted and preserved train path data used for non-coal services are current as at January 2025. The Model considers delays, maintenance, ICs, etc of below rail impacts on the coal system where non-coal operates however does not allow for any maintenance, provisioning, and trips to/from rail depots and above rail delays. The Model assumes these activities typically occur outside the AN rail infrastructure.

The Model allows for entry and exit paths into the coal system that may include private infrastructure.

Non-coal timetabled traffic includes:

- Passenger trains;
- Rockhampton Tilt Train (between Brisbane and Rockhampton);
- Spirit of Queensland (between Brisbane and Cairns);
- Spirit of the Outback (between Brisbane and Longreach, via Emerald);
- Agricultural products – grain and livestock;
- Freight; and
- Limestone.

In the Model, non-coal traffic types run to their own timetable, and Sectional Running Times, as documented in **Appendix A: Sectional Running Times.**

11.2. Non-Passenger Traffic

Timetables were provided by AN. Where appropriate, all timetables were adjusted to fit within an MTP-style plan, for compatibility with path dispatch within the Model.

Timetables are input to the Model as regular weekly schedules with a start junction, an end junction, and a departure time. A path aligned with each timetabled departure is reserved ahead of time to ensure the timetable is met. Once injected into the network, non-passenger traffic then interacts with coal traffic.

SRTs for non-passenger traffic were calculated from the scheduled section run times given in the data provided. Distinct SRT inputs were derived for each of the following traffic types:

- Limestone;
- Livestock and freight; and
- Grain.

11.3. Passenger Traffic

Passenger traffic travels on:

- the Blackwater System on the North Coast Line between Parana (at Gladstone) and Rocklands;
- the Blackwater System on the Central West Line between Rocklands and Nogoa; and
- the Newlands System on the North Coast Line between Durroburra and Kaili.

Timetables were sourced from the published QR latest timetables.

11.3.1. Blackwater System

The Model ensures priority for passenger traffic over all other types of traffic by preserving paths without actually dispatching a train. The key assumption here is that in any potential interaction with other traffic, the passenger train would be given priority. Most passenger traffic travels faster than other kinds of traffic, so it is necessary to remove the preceding path as well. Timetables are input to the Model as:

- a start junction (the path dispatch location);
- an end junction;
- a departure time (as at the location of the path dispatcher); and
- the number of paths to remove.

11.3.2. Newlands System

The Spirit of Queensland travels in the Newlands System at a location upstream of the path dispatcher at Pring, so this traffic is input as a regular timetable, similar to other non-passenger traffic in **Section 11.3 - Passenger Traffic** above.

This traffic runs to its own SRTs (see 'SRT Type PASSENGER' in **Appendix A2.2 Passenger**).

12. Abbreviations

The following abbreviations are used throughout this document:

ABBREVIATION	MEANING
ACAR	Annual Capacity Assessment Report
AIC	Akaike Information Criterion
AN	Aurizon Network
AO	Aurizon Operations
BCO	Block Change Outs
BRC	Bowen Rail Company
CQCN	Central Queensland Coal Network
DBCT	Dalrymple Bay Terminal
DNC	Deliverable Network Capacity
DTC	Direct Train Control
FL	Fisherman's Landing
FSS	Full System Shut
FY	Financial Year
GAPE	Goonyella to Abbott Point Expansion
HPCT	Hay Point Coal Terminal
ICAR	Initial Capacity Assessment Report
IC	Integrated Closure
IE	Independent Expert
LR	Load Rate (including unplanned delays)
MLPI	Main Line Points Indicators
Model	CQCN Dynamic Simulation Model
MRSB	Maintenance Renewal & Strategy Budget
MTP	Monthly Train Plan
NQXT	North Queensland Export Terminal
NRG	Gladstone Powerhouse

ABBREVIATION	MEANING
NTSF	Nebo Train Support Facility
OR	OneRail
PN	Pacific National
QR	Queensland Rail
QAL	Queensland Alumina Limited
QCA	Queensland Competition Authority
QCL	Cement Australia (Fisherman's Landing)
RCS	Remote Control Signalling
RGTCT	RG Tanna Coal Terminal
RRS	Rail Receival Station (Inloader)
RTA Yarwun	Rio Tinto's Yarwun Alumina Refinery
SAT	Ship Arrival table
SOP	System Operating Parameters
SRT	Sectional Running Time
Stanwell	Stanwell Powerhouse
TLO	Train Load Out
TBF	Time Between Failures
TSE	Train Service Entitlement
TSR	Temporary Speed Restriction
TTF	Time to Fail
TTR	Time to Repair
UR	Unload Rate (excluding unplanned delays)
UT5	Aurizon Network 2017 Access Undertaking
WICET	Wiggins Island Coal Export Terminal

Appendix A: Sectional Running Times

This Appendix contains input Sectional Running Times for:

- Coal rains in the CQCN; and
- Non-coal trains in the CQCN

A1 Coal trains

A1.1 Newlands-GAPE

The following tables of SRTs for Empty and Loaded running are for Pring-based diesel trains travelling in the Newlands and GAPE Systems. Only sections that Pring-based trains travel on are included.

Location from	Location to	Empty (minutes)	Loaded (minutes)
Newlands Trunk			
Abbot Point	BRC Junction	7	11
BRC Junction	Kaili	5	6
Kaili	Durroburra	8	10
Durroburra	Pring	8	3
Pring	Buckley	5	6
Buckley	Armuna	14	15
Armuna	Aberdeen	12	10
Aberdeen	Binbee	12	9
Binbee	Briaba	14	15
Briaba	Almoola	16	31
Almoola	Collinsville	6	6
Collinsville	McNaughton Junction	2	4
McNaughton Junction	Sonoma Junction	8	7
Sonoma Junction	Birralee	10	10
Birralee	Cockool	17	16
Cockool	Havilah	16	18
Havilah	CRN Junction	12	12
CRN Junction	Newlands Junction	2	2
Northern missing link (GAPE)			
Newlands Junction	Leichardt Range	4	7
Leichhardt Range	Byerwen Junction	11	12
Byerwen Junction	Suttor Creek	11	11
Suttor Creek	Eaglefield Creek	21	24
Eaglefield Creek	North Goonyella Junction	8	8
North Goonyella Branch			
North Goonyella	Junction Riverside	13	14
Riverside	Goonyella	5	6
Goonyella	Moranbah North Junction	5	4

Location from	Location to	Empty (minutes)	Loaded (minutes)
Moranbah North Junction	Wotonga	16	15
West Goonyella Branch			
Wotonga	Moranbah	19	15
Moranbah	Caval Ridge Junction	3	5
Caval Ridge Junction	Villafranca	13	17
Villafranca	Mount Mclaren	18	22
Mount Mclaren	Blackridge	21	23
Blackridge	Blair Athol Junction	15	21
Wotonga to Coppabella			
Wotonga	Isaac Plains Junction	3	2
Isaac Plains Junction	Mallawa	3	3
Mallawa	Carborough Downs Junction	8	12
Carborough Downs Junction	Broadlea	5	4
Broadlea	Coppabella	13	19
South Goonyella Branch			
Coppabella	Moorvale Junction	5	16
Moorvale Junction	Ingsdon	2	4
Ingsdon	Millennium Junction	5	8
Millennium Junction	Red Mountain	7	7
Red Mountain	Olive Downs Junction	5	4
Olive Downs Junction	Winchester	4	4
Winchester	Peak Downs	13	12
Peak Downs	Harrow	13	15
Harrow	Saraji	6	8
Saraji	Lake Vermont Junction	16	18
Lake Vermont Junction	Dysart	4	3
Dysart	Stephens	7	7
Stephens	Norwich Park	9	11
Norwich Park	Middlemount Junction	12	17
Mine Spurs			
Blair Athol Junction	Blair Athol (Clermont Mine)	3	2
Byerwen Junction	Byerwen	2	6
Caval Ridge Junction	Caval Ridge	15	12
Lake Vermont Junction	Lake Vermont	11	7
McNaughton Junction	McNaughton	8	6
Middlemount Junction	Middlemount	21	11
Newlands Junction	Newlands	8	9
Riverside	Riverside Balloon	4	1
Sonoma Junction	Sonoma	9	1
Millennium Junction	Millennium Balloon	2	4

A1.2 Goonyella

The following tables of SRTs for empty and loaded running are for Jilalan and Nebo-based electric and diesel trains travelling in the Goonyella System.

Location from	Location to	Empty (minutes)	Loaded (minutes)
Goonyella Trunk			
Dalrymple Bay	Dalrymple Bay Staging	3	3
Dalrymple Bay Staging	Dalrymple Crossover Points	4	5
Hay Point	Hay Point Entry	4	8
Hay Point Entry	Dalrymple Crossover Points	9	4
Dalrymple Crossover Points	Praguelands	7	6
Praguelands	Jilalan	6	1
Jilalan	Yukan	7	8
Yukan	Black Mountain	13	19
Black Mountain	Hatfield	12	12
Hatfield	Bolingbroke	11	12
Bolingbroke	Balook	13	14
Balook	Wandoo	9	12
Wandoo	Waitara	11	12
Waitara	Braeside	8	8
Braeside	Mindi	10	13
Mindi	South Walker Junction	7	7
South Walker Junction	Tootoolah	6	6
Tootoolah	Macarthur Junction	3	4
Macarthur Junction	Coppabella	9	5
Coppabella	Broadlea	11	19
Broadlea	Carborough Downs Junction	2	5
Carborough Downs Junction	Mallawa	9	9
Mallawa	Isaac Plains Junction	2	4
Isaac Plains Junction	Wotonga	2	3
South Goonyella Branch			
Coppabella	Moorvale Junction	6	13
Moorvale Junction	Ingsdon	2	2
Ingsdon	Millennium Junction	3	7
Millennium Junction	Red Mountain	7	6
Red Mountain	Olive Downs Junction	4	5
Olive Downs Junction	Winchester	5	4
Winchester	Peak Downs	13	12
Peak Downs	Harrow	13	14
Harrow	Saraji	6	10
Saraji	Lake Vermont Junction	15	22
Lake Vermont Junction	Dysart	4	3
Dysart	Stephens	7	7

Location from	Location to	Empty (minutes)	Loaded (minutes)
Stephens	Norwich Park	9	11
Norwich Park	Middlemount Junction	12	17
Middlemount Junction	Bundoora	2	3
Bundoora	German Creek	4	6
German Creek	Oaky Creek	15	20
Oaky Creek	Lilyvale	13	12
Lilyvale	Gregory Junction	1	2
North Goonyella Branch			
Wotonga	Moranbah North Junction	16	17
Moranbah North Junction	Goonyella	4	3
Goonyella	Riverside	4	4
Riverside	North Goonyella Junction	12	15
West Goonyella Branch			
Wotonga	Moranbah	17	16
Moranbah	Caval Ridge Junction	3	3
Caval Ridge Junction	Villafranca	16	16
Villafranca	Mount Mclaren	17	21
Mount Mclaren	Blackridge	21	22
Blackridge	Blair Athol Junction	16	19
Mine Spurs			
South Walker Junction	Bidgerley Junction	5	1
Bidgerley Junction	South Walker (Bidgerley Balloon)	6	2
Bidgerley Junction	Hail Creek	38	30
Blair Athol Junction	Blair Athol (Clermont Mine)	2	3
Carborough Downs Junction	Carborough Downs	9	3
Caval Ridge Junction	Caval Ridge	13	11
Goonyella	Goonyella Balloon	2	1
Isaac Plains Junction	Isaac Plains	5	2
Macarthur Junction	Macarthur (Coppabella Mine)	5	1
Mallawa	Burton	3	1
Middlemount Junction	Middlemount	19	9
Millennium Junction	Millennium	2	2
Moorvale Junction	Moorvale	6	1
Moranbah North Junction	Moranbah North	3	4
North Goonyella Junction	North Goonyella	3	3
Olive Downs Junction	Olive Downs Balloon	12	16
Peak Downs	Peak Downs Balloon	5	2
Riverside	Riverside Balloon	4	1
Saraji	Saraji Balloon	1	2

A1.3 Blackwater

The following tables of SRTs for empty and loaded running are for Callemondah-based electric and diesel trains travelling in the Blackwater System and Goonyella System.

Location from	Location to	Empty (minutes)	Loaded (minutes)
North Coast Line			
Callemondah	Mount Miller	12	14
Mount Miller	Wiggins Island Junction	5	4
Wiggins Island Junction	Yarwun	1	2
Yarwun	Aldoga	6	7
Aldoga	Mount Larcom	9	12
Mount Larcom	Ambrose	4	6
North Coast Line			
Ambrose	Epala	5	5
Epala	Raglan	7	10
Raglan	Marmor	11	11
Marmor	Bajool	8	9
Bajool	Archer	9	11
Archer	Midgee	7	8
Midgee	Rocklands	8	10
Blackwater Trunk			
Rocklands	Gracemere	5	8
Gracemere	Kabra	11	15
Kabra	Warren	6	6
Warren	Wycarbah	11	10
Wycarbah	Westwood	9	10
Westwood	Windah	10	19
Windah	Grantleigh	10	12
Grantleigh	Tunnel	8	9
Tunnel	Edungalba	12	19
Edungalba	Aroona	9	10
Aroona	Duaringa	7	10
Duaringa	Wallaroo	13	13
Wallaroo	Tryphinia	11	14
Tryphinia	Dingo	12	14
Dingo	Umolo	5	7
Umolo	Parnabal	6	4
Parnabal	Walton	5	4
Walton	Bluff	11	13
Bluff	Boonal Balloon Points	9	12
Boonal Balloon Points	Blackwater	12	13
Blackwater	Sagittarius	3	6
Sagittarius	Rangal	3	5

Location from	Location to	Empty (minutes)	Loaded (minutes)
Rangal	Burngrove	7	8
South Goonyella Branch			
Burngrove	Washpool Junction	7	8
Washpool Junction	Crew	1	1
Crew	Mackenzie	12	14
Mackenzie	Fairhill	11	12
Fairhill	Yan Yan	12	13
Yan Yan	Gregory Junction	9	10
Gregory Junction	Lilyvale	2	2
Lilyvale	Oaky Creek Junction	12	15
Oaky Creek Junction	German Creek Junction	16	17
German Creek Junction	Bundoora	2	4
Bundoora	Middlemount Junction	2	2
Middlemount Junction	Norwich Park	14	14
Norwich Park	Stephens	10	12
Stephens	Dysart	8	7
Dysart	Lake Vermont Junction	3	5
Rolleston (Bauhinia) Branch			
Rangal	Tikardi	7	6
Tikardi	Boorgoon Junction	5	6
Boorgoon Junction	Kinrola Junction	6	8
Kinrola Junction	Kenmare	23	22
Kenmare	Memooloo	27	34
Memooloo	Starlee	33	33
Starlee	Meteor Downs Junction	19	20
Meteor Downs Junction	Rolleston	8	13
Domestic and Export Terminals			
Golding	Gladstone Powerhouse Junction	8	5
Gladstone Powerhouse Junction	Callemondah	10	7
Gladstone Powerhouse	Callemondah	11	2
Wiggins Island	Wiggins Island Staging	8	6
Wiggins Island Staging	Wiggins Island Junction	6	7
Comalco Balloon Junction	Fisherman's Landing	9	6
Stanwell Powerhouse	Warren	5	3
Mine Spurs			
Boonal Balloon Points	Boonal Balloon	2	3
Kinrola Junction	Kinrola	6	4
Mackenzie	Ensham	12	10
Sagittarius	Curragh	13	11
Yan Yan	Gordonstone Balloon	13	12
Blackwater	Taurus	40	32
Taurus	Koorilgah	7	4

A1.4 Moura

The following tables of SRTs for empty and loaded running are for Callemondah-based diesel trains travelling in the Moura System.

Location from	Location to	Empty (minutes)	Loaded (minutes)
Moura Trunk			
Callemondah	Byellee	6	11
Byellee	Stowe	17	15
Stowe	Graham	4	9
Graham	Stirrat	10	9
Stirrat	Clarke	20	24
Clarke	Fry	11	11
Fry	Mount Rainbow	21	24
Mount Rainbow	Dumgree	19	29
Dumgree	Boundary Hill Junction	11	14
Boundary Hill Junction	Annandale	3	1
Annandale	Earlsfield	7	14
Earlsfield	Belldeen	26	23
Belldeen	Moura Mine Junction	23	39
Callide Branch			
Earlsfield	Koonkool	7	2
Koonkool	Dakenba	31	30
Dakenba	Callide Coalfields	17	21
Mine Spurs			
Boundary Hill Junction	Boundary Hill	7	4
Moura Mine Junction	Moura Mine	2	2
Moura Mine Junction	Baralaba Balloon Loop	31	31
Gladstone Surrounds			
Gladstone QAL SDG	South Gladstone	5	7
Parana	Callemondah	11	10
South Gladstone	Parana	7	10

A2 Non-coal Trains

A2.1 Limestone

The following table of SRTs for up and down running is for diesel trains carrying Limestone and travelling between East End and Fisherman's Landing in the Blackwater System. Only sections that these trains travel on are included.

Location from	Location to	Up (minutes)	Down (minutes)
East End Mine	East End Junction	10	10
East End Junction	Aldoga	15	15
Aldoga	Yarwun	9	9
Yarwun	Mt Miller	6	6
Mt Miller	Comalco Junction	3	3
Comalco Junction	Fisherman's Landing Unloader	10	10
Callemondah	Mt. Miller	5	5
Wiggins Island Junction	Yarwun	2	2
Mt Miller	Wiggins Island Junction	4	4
Stowe	Graham	14	14
Byellee	Stowe	6	6
NCL Moura	Byellee	2	2
Callemondah	NCL Moura	3	3
Callemondah	Byellee	5	5

A2.2 Passenger

The following table of SRTs for up and down running is for the diesel Spirit of Queensland passenger trains travelling in the Newlands System. Only sections that these trains travel on are included.

Location from	Location to	Up (minutes)	Down (minutes)
QNIP02	Durroburra	2	2
Durroburra	Kaili	6	6
Kaili	QNIP01	3	3

A2.3 Freight and Livestock

The following table of SRTs for up and down running is for diesel Freight and Livestock trains travelling in the Blackwater and Newlands Systems. Only sections that these trains travel on are included.

Location from	Location to	Up (minutes)	Down (minutes)
Parana	Callemondah	9	9
Callemondah	Mt Miller	8	6
Mt Miller	Yarwun	5	5
Yarwun	Aldoga	8	8
Aldoga	Mt Larcom	8	7
Mt Larcom	Ambrose	4	4
Ambrose	Epala	5	4
Epala	Raglan	6	6
Raglan	Marmor	8	7

Location from	Location to	Up (minutes)	Down (minutes)
Marmor	Bajool	6	7
Bajool	Archer	7	7
Archer	Midgee	6	5
Midgee	Rocklands	5	5
Rocklands	Gracemere	9	10
Gracemere	Kabra	4	4
Kabra	Warren	10	11
Warren	Wycarbah	9	10
Wycarbah	Westwood	7	9
Westwood	Windah	9	13
Windah	Grantleigh	10	10
Grantleigh	Tunnel	7	9
Tunnel	Edungalba	10	19
Edungalba	Aroona	10	11
Aroona	Duaringa	10	7
Duaringa	Wallaroo	10	11
Wallaroo	Tryphinia	11	11
Tryphinia	Dingo	11	11
Dingo	Umolo	7	8
Umolo	Parnabal	3	4
Parnabal	Walton	8	4
Walton	Bluff	13	11
Bluff	Boonal Balloon Points	12	9
Boonal Balloon Points	Boonal	1	1
Boonal	Blackwater	10	10
Blackwater	Sagittarius	6	3
Sagittarius	Rangal	4	4
Rangal	Burngrove	6	6
Burngrove	Tolmies	2	2
Tolmies	Comet	17	23
Comet	Yamala	18	19
Yamala	Nogoa	20	20
QNIP02	Durroburra	1	1
Durroburra	Kaili	6	6
Kaili	QNIP01	2	2

A2.4 Grain

The following table of SRTs for up and down running is for diesel Grain trains travelling in the Blackwater and Goonyella Systems. Only sections that these trains travel on are included.

Location from	Location to	Up (minutes)	Down (minutes)
Parana	Callemondah	9	9
Callemondah	Mt Miller	9	6
Mt Miller	Yarwun	6	4
Yarwun	Aldoga	8	8
Aldoga	Mt Larcom	8	7

Location from	Location to	Up (minutes)	Down (minutes)
Mt Larcom	Ambrose	5	4
Ambrose	Epala	5	4
Epala	Raglan	6	7
Raglan	Marmor	7	7
Marmor	Bajool	7	7
Bajool	Archer	7	7
Archer	Midgee	7	6
Midgee	Rocklands	5	7
Rocklands	Gracemere	9	10
Gracemere	Kabra	4	4
Kabra	Warren	10	11
Warren	Wycarbah	9	10
Wycarbah	Westwood	7	9
Westwood	Windah	9	13
Windah	Grantleigh	10	10
Grantleigh	Tunnel	7	9
Tunnel	Edungalba	11	13
Edungalba	Aroona	8	8
Aroona	Duaringa	8	8
Duaringa	Wallaroo	10	11
Wallaroo	Tryphinia	11	11
Tryphinia	Dingo	11	11
Dingo	Umolo	6	6
Umolo	Parnabal	6	6
Parnabal	Walton	4	4
Walton	Bluff	6	7
Bluff	Boonal Balloon Points	9	8
Boonal Balloon Points	Boonal	1	1
Boonal	Blackwater	9	10
Blackwater	Sagittarius	3	3
Sagittarius	Rangal	4	4
Rangal	Burngrove	6	6
Burngrove	Tolmies	2	2
Tolmies	Comet	17	23
Comet	Yamala	18	19
Yamala	Nogoa	20	20
Yukan	Black Mountain	12	16
Black Mountain	Hatfield	11	13
Hatfield	Bolingbroke	9	9
Bolingbroke	Balook	13	13
Balook	Wandoo	9	9
Wandoo	Waitara	12	14

Location from	Location to	Up (minutes)	Down (minutes)
Waitara	Braeside	6	6
Braeside	Mindi	11	11
Mindi	South Walker Junction	6	6
South Walker Junction	Tootoolah	5	5
Tootoolah	Macarthur Junction	4	4
Macarthur Junction	Coppabella	5	6
Coppabella	Broadlea	13	13
Broadlea	Carborough Downs Junction	3	4
Carborough Downs Junction	Mallawa	7	11
Mallawa	Isaac Plains Junction	3	5
Isaac Plains Junction	Wotonga	2	3
Wotonga	Moranbah	13	14
Moranbah	Caval Ridge Junction	3	3
Caval Ridge Junction	Villafranca	15	15
Villafranca	Mt McLaren	16	18

Appendix B: Below Rail Maintenance

B1 FY26 – FY30 Maintenance hours by mainline and branch line[1]

Includes integrated closures (full system and branch line shuts) and below rail maintenance (major and minor).

		FY26													FY27-FY30
Main / Branch Line	AN's Reporting Corridor	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual Total	Annual Total
1. M.L. - Collinsville to Pring 1A: B.L. - Pring to Abbot Point 1B: B.L. - Newlands Junction to Collinsville 2A: B.L. - North Goonyella Junction to Newlands	Newlands Mainline (incl Gape and Ports)	30	31	173	60	47	39	49	24	190	47	61	27	**778**	**778**
3. M.L. - Coppabella to Jilalan 3A: B.L. - Jilalan to Port of Hay Point 3D: B.L. - Coppabella to Wotonga	Goonyella Mainline (incl Ports)	223	130	253	199	108	146	230	217	214	116	266	101	**2,203**	**2,203**
3B: B.L. - Hail Creek Mine to South Walker Creek Junction	Hail Creek Branch	-	3	6	5	2	4	3	-	1	2	4	2	**32**	**32**
3C: B.L. - Oaky Creek Junction to Coppabella	Gregory Branch (Goonyella)	75	65	96	38	49	60	47	28	37	96	84	38	**712**	**712**
3E: B.L. - North Goonyella Mine to Wotonga	North Goonyella Branch	15	30	30	14	56	42	39	14	36	21	47	31	**374**	**374**
3F: B.L. - Blair Athol Mine to Wotonga	Blair Athol Branch	29	16	24	34	131	67	93	76	32	23	156	29	**710**	**710**
4. M.L. - Bluff to Callemondah 4A: B.L. - Callemondah to Port of Gladstone	Blackwater Mainline (incl Ports)	316	352	355	415	365	124	528	249	442	491	404	341	**4,381**	**4,381**
4B: B.L. - Burngrove to Bluff	Koorilgah Branch	7	1	2	7	-	3	-	8	-	7	0	14	**49**	**49**
4C: B.L. - Rolleston Mine to Rangal	Rolleston Branch	130	7	20	73	12	18	22	62	10	46	26	32	**460**	**460**
4D: B.L. - Oaky Creek Junction to Burngrove	Gregory Branch (Blackwater)	24	2	16	8	8	10	7	4	14	53	37	12	**194**	**194**
5. M.L. - Dumgree to Callemondah	Moura Mainline (incl Ports)	83	182	58	46	114	37	166	56	53	173	64	96	**1,130**	**1,130**

[1] *1. In line with AN's reporting method, hours for maintenance possessions impacting multiple mainlines and branch lines are reported in both. This means the total hours will not match those in Appendix B2 Maintenance Hours by Maintenance Type and Coal System.*

Main / Branch Line	AN's Reporting Corridor	FY26 Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual Total	FY27-FY30 Annual Total
5A: B.L. - Dumgree to Earlsfield															
5C: B.L. - Earlsfield to Moura															
5B: B.L. - Earlsfield to Callide	Callide Branch	7	7	1	7	8	4	15	7	2	16	13	15	**101**	**101**

B2 FY26 – FY30 Maintenance hours by Maintenance Type and Coal System

Includes integrated closures (full system and branch line shuts) and below rail maintenance (major and minor).

System	Maintenance Type	FY26 Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual Total	FY27 - FY30 Annual Total
CQCN	integrated closures	130	152	266	116	108	-	156	36	156	168	162	-	**1,450**	**1,450**
	Major Maintenance	376	139	174	213	243	38	323	222	307	206	168	68	**2,475**	**2,475**
	Minor Maintenance	376	488	546	535	523	467	640	463	511	655	783	557	**6,543**	**6,543**
	Total	**881**	**778**	**986**	**864**	**874**	**505**	**1,119**	**720**	**974**	**1,029**	**1,113**	**625**	**10,468**	**10,468**
Newlands-GAPE	integrated closures			108		24				60	24			**216**	**216**
	Major Maintenance			6	12		7			96				**121**	**121**
	Minor Maintenance	30	31	58	48	**23**	31	48	24	28	23	61	27	**432**	**432**
	Total	**30**	**31**	**172**	**60**	**47**	**38**	**48**	**24**	**184**	**47**	**61**	**27**	**769**	**769**
Goonyella	integrated closures	60		84	56	60		36	36	60		60		**452**	**452**
	Major Maintenance	141	62	79	27	116	8	110	146	52	37	80	14	**871**	**871**
	Minor Maintenance	124	170	225	193	161	276	238	149	183	195	376	157	**2,448**	**2,448**
	Total	**325**	**232**	**388**	**276**	**337**	**284**	**383**	**331**	**295**	**232**	**516**	**171**	**3,771**	**3,771**
Blackwater	integrated closures	60	68	74	60			36		36	60	102		**496**	**496**
	Major Maintenance	234	53	89	174	127	23	214	76	159	169	88	54	**1,458**	**1,458**
	Minor Maintenance	175	236	228	262	258	130	305	240	271	358	277	321	**3,060**	**3,060**
	Total	**469**	**356**	**391**	**496**	**385**	**153**	**555**	**315**	**466**	**587**	**467**	**375**	**5,014**	**5,014**

		FY26													FY27 - FY30
System	**Maintenance Type**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Annual Total**	**Annual Total**
Moura	integrated closures	10	84			24		84			84			**286**	**286**
	Major Maintenance		24											**24**	**24**
	Minor Maintenance	47	50	36	31	81	31	48	50	29	79	69	52	**604**	**604**
	Total	**57**	**158**	**36**	**31**	**105**	**31**	**132**	**50**	**29**	**163**	**69**	**52**	**914**	**914**

B3 Moving Maintenance – Rail Grinding per Section

Section From	Section To	Frequency (times per year)	Average Duration (minutes)	Annual Duration (minutes)	Annual Section Occupancy (minutes)
Newlands-GAPE Systems					
Briaba	Almoola	4	109	**436**	**654**
Almoola	Briaba	4	75	**300**	**450**
Almoola	Collinsville	4	14	**56**	**84**
Collinsville	Almoola	4	24	**96**	**144**
Collinsville	McNaughton	4	7	**28**	**42**
McNaughton Junction	Sonoma Junction	4	29	**116**	**174**
Sonoma Junction	Birralee	4	42	**168**	**252**
Binbee	Briaba	3	79	**237**	**356**
Briaba	Binbee	3	65	**195**	**293**
Pring	Buckley	2	19	**38**	**57**
Buckley	Pring	2	20	**40**	**60**
Buckley	Armuna	2	93	**186**	**279**
Armuna	Buckley	2	53	**106**	**159**
Armuna	Aberdeen	2	75	**150**	**225**
Aberdeen	Armuna	2	62	**124**	**186**
Aberdeen	Binbee	2	61	**122**	**183**
McNaughton Junction	Collinsville	2	10	**20**	**30**
Binbee	Aberdeen	2	52	**104**	**156**
Sonoma Junction	McNaughton	2	24	**48**	**72**
Birralee	Sonoma Junction	2	30	**60**	**90**
Birralee	Cockool	2	79	**158**	**237**
Cockool	Birralee	2	66	**132**	**198**
Havilah	Cockool	2	112	**224**	**336**
Cockool	Havilah	2	79	**158**	**237**
Carmichael Junction	Havilah	2	69	**138**	**207**
Havilah	Carmichael Junction	2	57	**114**	**171**
Carmichael Junction	Newlands Main Line	2	8	**16**	**24**
Newlands Main Line	Carmichael Junction	2	11	**22**	**33**
Byerwen Junction	Leichhardt Range	2	61	**122**	**183**
Leichhardt Range	Byerwen Junction	2	53	**106**	**159**
Byerwen Junction	Suttor Creek	2	46	**92**	**138**
Suttor Creek	Byerwen Junction	2	71	**142**	**213**
Suttor Creek	Eaglefield Creek	2	89	**178**	**267**
Eaglefield Creek	Suttor Creek	2	171	**342**	**513**
North Goonyella Junction	Eaglefield Creek	2	34	**68**	**102**
Suttor Creek	Eaglefield Creek	2	89	**178**	**267**
Durroburra	Kaili	2	36	**72**	**108**
Kaili	Durroburra	2	28	**56**	**84**
Kaili	BRC Junction	2	13	**26**	**39**
Abbot Point Staging	BRC Junction	2	25	**50**	**75**
BRC Junction	Kaili	2	14	**28**	**42**

Section From	Section To	Frequency (times per year)	Average Duration (minutes)	Annual Duration (minutes)	Annual Section Occupancy (minutes)
BRC Junction	Abbot Point Staging	2	27	**54**	**81**
Total				**5,106**	**7,659**

Goonyella System					
Yukan	Black Mountain	8	109	**872**	**1,308**
Black Mountain	Hatfield	8	71	**568**	**852**
Wandoo	Waitara	8	72	**576**	**864**
Waitara	Braeside	8	51	**408**	**612**
Braeside	Mindi	8	76	**608**	**912**
Mindi	South Walker	8	51	**408**	**612**
South Walker Junction	Tootoolah	8	37	**296**	**444**
Tootoolah	Macarthur Junction	8	28	**224**	**336**
Macarthur Junction	Coppabella	8	31	**248**	**372**
Coppabella	Macarthur Junction	10	39	**390**	**585**
Macarthur Junction	Tootoolah	10	32	**320**	**480**
Tootoolah	South Walker	10	36	**360**	**540**
South Walker Junction	Mindi	10	51	**510**	**765**
Mindi	Braeside	10	76	**760**	**1,140**
Braeside	Waitara	10	55	**550**	**825**
Waitara	Wandoo	10	101	**1,010**	**1,515**
Wandoo	Balook	10	72	**720**	**1,080**
Balook	Bolingbroke	10	127	**1,270**	**1,905**
Bolingbroke	Hatfield	10	75	**750**	**1,125**
Hatfield	Black Mountain	10	90	**900**	**1,350**
Black Mountain	Yukan	10	110	**1,100**	**1,650**
Yukan	Oonooie	10	23	**230**	**345**
Hatfield	Bolingbroke	10	69	**690**	**1,035**
Bolingbroke	Balook	10	108	**1,080**	**1,620**
Balook	Wandoo	10	51	**510**	**765**
Oonooie	Jilalan	10	36	**360**	**540**
Jilalan	Oonooie	10	36	**360**	**540**
Oonooie	Yukan	10	21	**210**	**315**
Jilalan	Praguelands	8	36	**288**	**432**
Praguelands	Dalrymple Crossover	8	45	**360**	**540**
Dalrymple Crossover Points	Praguelands	8	33	**264**	**396**
Praguelands	Jilalan	8	38	**304**	**456**
Total				**17,504**	**26,256**

Blackwater System					
Walton	Bluff	2	57	**114**	**171**
Umolo	Parnabal	2	45	**90**	**135**
Parnabal	Walton	2	46	**92**	**138**
Callemondah	Gladstone	2	44	**88**	**132**

Section From	Section To	Frequency (times per year)	Average Duration (minutes)	Annual Duration (minutes)	Annual Section Occupancy (minutes)
Gladstone Powerhouse Junction	Callemondah	2	9	**18**	**27**
Gladstone Powerhouse Junction	Golding	2	19	**38**	**57**
Golding	Gladstone	2	19	**38**	**57**
Warren	Wycarbah	3	119	**357**	**536**
Westwood	Windah	3	87	**261**	**392**
Tryphinia	Dingo	3	95	**285**	**428**
Bajool	Archer	3	75	**225**	**338**
Tunnel	Edungalba	3	69	**207**	**311**
Windah	Grantleigh	3	76	**228**	**342**
Gracemere	Kabra	3	89	**267**	**401**
Duaringa	Wallaroo	3	65	**195**	**293**
Wallaroo	Tryphinia	3	88	**264**	**396**
Archer	Midgee	3	67	**201**	**302**
Aldoga	Mt. Larcom	3	50	**150**	**225**
Edungalba	Aroona	3	66	**198**	**297**
Ambrose	Epala	3	55	**165**	**248**
Midgee	Archer	3	58	**174**	**261**
Yarwun	Aldoga	3	58	**174**	**261**
Grantleigh	Tunnel	3	43	**129**	**194**
Wycarbah	Westwood	3	61	**183**	**275**
Aroona	Duaringa	3	52	**156**	**234**
Callemondah	Mt. Miller	3	45	**135**	**203**
Rocklands	Midgee	3	36	**108**	**162**
Dingo	Umolo	3	36	**108**	**162**
Mt. Miller	Yarwun	3	40	**120**	**180**
Dingo	Tryphinia	4	89	**356**	**534**
Windah	Westwood	4	64	**256**	**384**
Wycarbah	Warren	4	85	**340**	**510**
Epala	Raglan	4	82	**328**	**492**
Grantleigh	Windah	4	68	**272**	**408**
Raglan	Marmor	4	61	**244**	**366**
Tunnel	Grantleigh	4	70	**280**	**420**
Marmor	Raglan	4	55	**220**	**330**
Kabra	Warren	4	80	**320**	**480**
Kabra	Gracemere	4	79	**316**	**474**
Marmor	Bajool	4	51	**204**	**306**
Bajool	Marmor	4	49	**196**	**294**
Raglan	Epala	4	53	**212**	**318**
Archer	Bajool	4	44	**176**	**264**
Rocklands	Gracemere	4	54	**216**	**324**
Midgee	Rocklands	4	47	**188**	**282**
Warren	Kabra	4	44	**176**	**264**
Westwood	Wycarbah	4	40	**160**	**240**

Section From	Section To	Frequency (times per year)	Average Duration (minutes)	Annual Duration (minutes)	Annual Section Occupancy (minutes)
Gracemere	Rocklands	4	38	**152**	**228**
Edungalba	Tunnel	5	83	**415**	**623**
Aroona	Edungalba	5	64	**320**	**480**
Mt. Larcom	Aldoga	5	63	**315**	**473**
Tryphinia	Wallaroo	5	98	**490**	**735**
Wallaroo	Duaringa	5	61	**305**	**458**
Aldoga	Yarwun	5	50	**250**	**375**
Walton	Parnabal	5	42	**210**	**315**
Duaringa	Aroona	5	62	**310**	**465**
Umolo	Dingo	5	49	**245**	**368**
Bluff	Walton	5	45	**225**	**338**
Ambrose	Mt. Larcom	5	43	**215**	**323**
Parnabal	Umolo	5	44	**220**	**330**
Yarwun	Mt. Miller	5	34	**170**	**255**
Epala	Ambrose	5	46	**230**	**345**
Mt. Miller	Callemondah	5	32	**160**	**240**
Mt. Larcom	Ambrose	5	49	**245**	**368**
Total				**13,705**	**20,558**
Moura System					
Fry	Mt. Rainbow	2	214	**428**	**641**
Mt. Rainbow	Dumgree	1	116	**116**	**174**
Stirrat	Clarke	1	**111**	**111**	**167**
Byellee	Stowe	1	**71**	**71**	**106**
Graham	Stirrat	1	**72**	**72**	**109**
Clarke	Fry	1	**76**	**76**	**113**
Stowe	Graham	2	**28**	**55**	**83**
Annandale	Earlsfield	1	**50**	**50**	**74**
Callemondah	Byellee	1	**23**	**23**	**35**
Stirrat	Graham	2	**57**	**114**	**171**
Total				**1,115**	**1,673**

B4 Infrastructure Maintenance – Hi-rail (Road Patrol) Schedule per System

System	Route	Week Schedule: Week A (Start - Stop Times per Week Day)					Week Schedule: Week B (Start - Stop Times per Week Day)				
		Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri
Newlands-GAPE	Abbot Point - Collinsville					8:30 - 11:00					
	Collinsville - Abbot Point										8:30 - 12:00
	Briaba - Havilah								8:30 - 12:00		
	Havilah - Briaba			8:30 - 12:00							
	Cockool - North Goonyella Junction		8:30 - 12:30								
	North Goonyella Junction - Cockool							10:00 - 14:30			
	Total - Hours per week day	**-**	**4.0**	**3.5**	**-**	**2.5**	**-**	**4.5**	**3.5**	**-**	**3.5**
Goonyella	Yukan - Ports - Yukan	8:30 - 13:30									
	Yukan - South Walker Junction							8:30 - 12:30			
	South Walker Junction - Yukan								10:00 - 12:30		
	South Walker Junction - North Goonyella Junction	9:30 - 13:30									
	North Goonyella Junction - South Walker Junction						10:30 - 13:30				
	Moranbah - Blair Athol - Wotonga		9:30 - 12:30								
	Coppabella - Dysart			9:30 - 13:30							
	Dysart - Coppabella								9:00 - 12:00		
	Saraji - Oaky Creek				10:00 - 12:00						
	Total - Hours per week day	**9.0**	**3.0**	**4.0**	**2.0**	**-**	**3.0**	**4.0**	**5.5**	**-**	**-**
Blackwater	Rangal - Fairhill	10:30 - 11:30					10:30 - 11:30				
	Rocklands - Callemondah	10:00 - 13:00					10:00 - 13:00				
	Ports - East End - Ports		9:30 - 11:30					9:30 - 11:30			
	Midgee - Dingo			8:00 - 12:30							
	Dingo - Midgee								9:30 - 10:30		
	Rangal - Rolleston - Rangal			7:00 - 10:30							
	Rangal - Duaringa							10:30 - 11:30			
	Burngrove - Oaky Creek - Burngrove				8:00 - 12:00						
	Dingo - Burngrove							8:30 - 11:00			

System	Route	Week Schedule: Week A (Start - Stop Times per Week Day)					Week Schedule: Week B (Start - Stop Times per Week Day)				
		Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri
	Mt Miller - Rocklands									8:30 - 11:00	
	Total - Hours per week day	**4.0**	**2.0**	**8.0**	**4.0**	**-**	**4.0**	**5.5**	**1.0**	**2.5**	**-**
Moura	Dumgree - Callide - Dumgree		9:00 - 11:30					9:00 - 11:30			
	Earlsfield - Callemondah			9:30 - 11:30							
	Earlsfield - Callide					8:00 - 9:30					
	Graham - Earlsfield								9:00 - 12:00		
	Callemondah - Stowe										9:00 - 9:30
	Total - Hours per week day	**-**	**2.5**	**2.0**	**-**	**1.5**	**-**	**2.5**	**3.0**	**-**	**0.5**

Appendix C: Non-coal Traffic Timetables

C1 Summary of Non-coal Traffic Timetables

Traffic type		From	To	Number of modelled services per week	Number of coal train paths used
Passenger	Rockhampton Tilt	Gladstone	Rocklands	8	2
		Rocklands	Gladstone	8	2
	Spirit of QLD	Gladstone	Rocklands	6	2
		Rocklands	Gladstone	6	2
		Durroburra	Kaili	6	1
		Kaili	Durroburra	6	1
	Spirit of Outback	Gladstone	Nogoa	3	2
		Nogoa	Gladstone	3	2
Limestone		East End mine	Fisherman’s Landing	44	1
		Fisherman’s Landing	East End mine	44	1
Livestock		Parana	Rocklands	5	1
		Rocklands	Parana	5	1
		Rocklands	Nogoa	4	1
		Nogoa	Rocklands	4	1
		Durroburra	Kaili	4	1
		Kaili	Durroburra	4	1
Freight		Parana	Rocklands	63	1
		Rocklands	Parana	64	1
		Rocklands	Nogoa	2	1
		Nogoa	Rocklands	2	1
		Durroburra	Kaili	33	1
		Kaili	Durroburra	33	1
Grain		Parana	Rocklands	1	1
		Rocklands	Parana	1	1
		Rocklands	Nogoa	-	1
		Nogoa	Rocklands	-	1
		Yukan	Mt McLaren	4	1
		Mt McLaren	Yukan	4	1

Appendix D: Modelled Rail Infrastructure for Private Infrastructure

Private Infrastructure
Private Infrastructure that has been modelled within the Model includes:

In the Newlands and GAPE Systems:

- Boundaries to QR managed track: Kaili and Durroburra;
- Byerwen Junction to Byerwen balloon loop;
- Carmichael Junction to Carmichael Mine balloon loop. This infrastructure has been updated to include actual private rail network including passing loops along with scheduled sectional run times; and
- BRC Rail Yard (adjacent to Abbot Point terminal).

In the Goonyella System:

- Nebo Depot;
- Caval Ridge Junction to Caval Ridge balloon loop;
- Olive Downs Junction to Olive Downs balloon loop; and
- Middlemount Junction to Middlemount balloon loop.

In the Blackwater System:

- East End Junction to East End balloon loop; and
- Meteor Downs South Spur line and balloon loop.

In the Moura System:

- QAL junction to QAL siding; and
- Baralaba Junction to Baralaba balloon loop.

Appendix E: committed capacity Demand (TSEs) (scaled)

E1 FY26 committed capacity - Scaled (TSEs)

[redacted]

[redacted]

[redacted]

E2 FY27 committed capacity - Scaled (TSEs)

[redacted]

[redacted]

[redacted]

E3 FY28 committed capacity - Scaled (TSEs)

[redacted]

[redacted]

[redacted]

E4 FY29 committed capacity - Scaled (TSEs)

[redacted]

[redacted]

[redacted]

E5 FY30 committed capacity - Scaled (TSEs)

[redacted]

[redacted]

[redacted]

[redacted]

Appendix F: Train Loadout Parameters

The following data relates to Train Loadout key parameters used in the Model.

Pre and post load times are applied equally across all TLO's and is summarised in the main body of the SOP.

F1 TLO Balloon Loop Capacities (Model Inputs)

[redacted]

F2 TLO Planned Maintenance (outside IC events)

[redacted]

[redacted]

For TLOs that show no planned maintenance, the maintenance is assumed to occur during ICs only and therefore is not explicitly modelled.

F3 TLO Load Rate (including unplanned delays) (Model Inputs)

[redacted]

[redacted]

F4 payload

[redacted]

[redacted]

[redacted]

F5 Lightload payload (Model Inputs)

This is the light payload that is used for each TLO when the light load probability is applied.

[redacted]

[redacted]

F6 Load Time at TLO (Model Input)

Loading times represent the 50th percentile and 70th percentile values that a train is expected to spend loading (coal dropping) at a Train Loadout (TLO). The model also applies a pre load delay of 7 minutes and a post load delay of 8 minutes.

[redacted]

[redacted]

[redacted]

F7 TLO Dispatch Separation Time (Model Input)

[redacted]

[redacted]

Appendix G: Inloader Parameters

The following data relates to Inloader key parameters used in the Model.

G1 Inloader Planned Maintenance (Model Inputs)

[redacted]

[redacted]

[redacted]

[redacted]

G2 Inloader Unload Rate (excluding unplanned delays) (Model Inputs)

[redacted]

G3 Inloader Unplanned Maintenance – Cycle (Model Inputs)

[redacted]

G4 Inloader Unplanned Maintenance – Duration (Model Inputs)

[redacted]

G5 Unload Time at Terminal (Model Outputs)

Unloading times represent the median 50th percentile (P50) and 70th percentile (P70) values that a train may spend unloading at a terminal across the five-year assessment period.

[redacted]

G6 Inloader Pre and Post Unload Delay Times (Model Inputs)

Pre and post unload times used in the Model for each terminal.

[redacted]

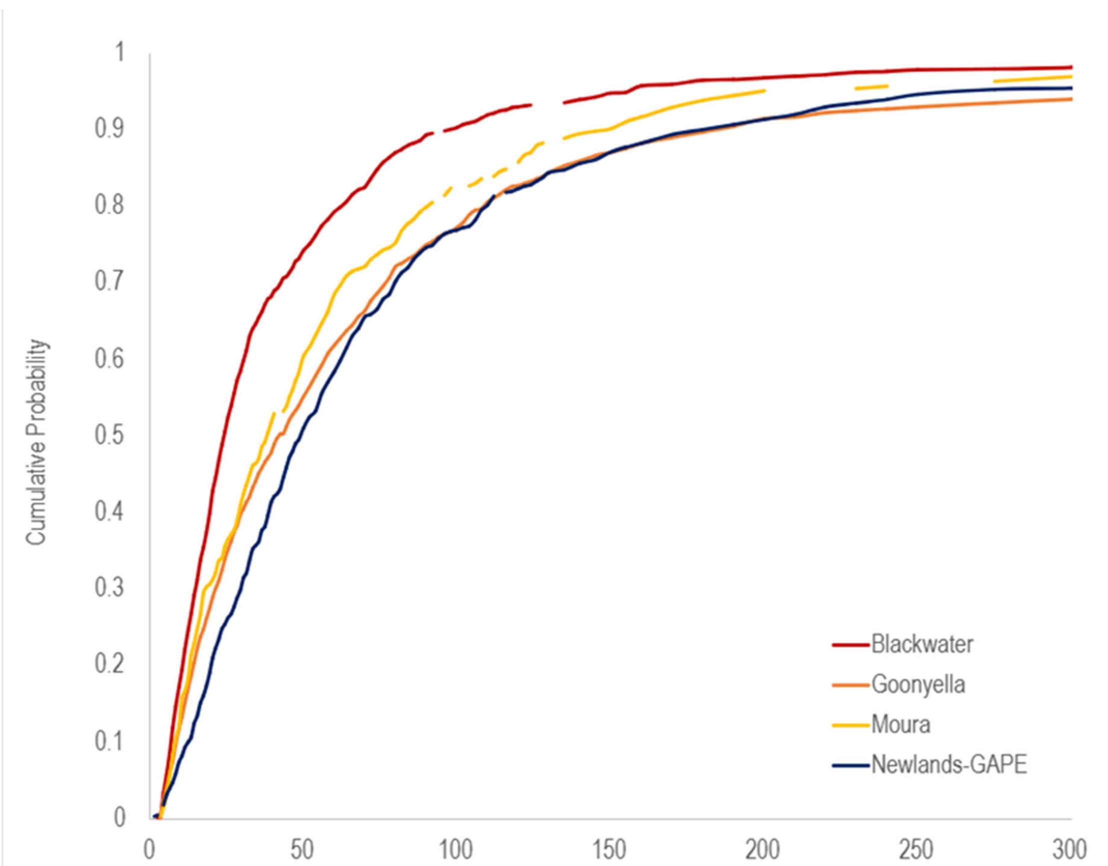
Appendix H: Delay Parameters

H1 General Delays Frequency (TTF) per Coal System (Model Inputs)

coal system	Expected track usage between general delays (kilometres)	Track usage between primary track delays distribution	
		Distribution	Rate
Newlands-GAPE	3,479	EXPONENTIAL	2.87E-04
Goonyella	2,298	EXPONENTIAL	4.35E-04
Blackwater	2,502	EXPONENTIAL	4.00E-04
Moura	1,977	EXPONENTIAL	5.06E-04

H2 General Delays Duration (TTR) per Coal System (Model Inputs)

coal system	Expected general delays (P50) (minutes)	Expected general delays (P70) (minutes)	Lower Limit (minutes)	Upper Limit (minutes)
Newlands-GAPE	50	80	1.5	1,500
Goonyella	43	78	3.5	1,500
Blackwater	25	44	1.5	1,500
Moura	39	64	3.5	1,500



H3 Coal System Delay Minutes Allocation (Model Output)

The allocation of delays for each coal system. Values represent the median for the five-year assessment period.

System	Type	Delays per Responsibility (minutes)
Newlands-GAPE	Below	604,300
	Above	1,343,099
	Other	1,376,221
	Sub Total	**3,323,620**
Goonyella	Below	805,006
	Above	3,711,660
	Other	1,282,147
	Sub Total	**5,798,813**
Blackwater	Below	768,140
	Above	3,537,273
	Other	1,574,294
	Sub Total	**5,879,707**
Moura	Below	90,967
	Above	560,492
	Other	173,572
	Sub Total	**825,031**
Total		**15,827,171**

H4 TSR Frequency (Model Inputs)

Group	Expected Time between TSR Events (hours)	Month	Distribution	Rate
LowTSR	2,605	January	EXPONENTIAL	6.40E-06
	2,374	February	EXPONENTIAL	7.02E-06
	2,181	March	EXPONENTIAL	7.64E-06
	2,197	April	EXPONENTIAL	7.59E-06
	1,711	May	EXPONENTIAL	9.74E-06
	2,290	June	EXPONENTIAL	7.28E-06
	2,834	July	EXPONENTIAL	5.88E-06
	3,202	August	EXPONENTIAL	5.21E-06
	2,776	September	EXPONENTIAL	6.00E-06
	3,341	October	EXPONENTIAL	4.99E-06
	2,962	November	EXPONENTIAL	5.63E-06
	3,043	December	EXPONENTIAL	5.48E-06
MidTSR	1128	January	EXPONENTIAL	1.48E-05
	958	February	EXPONENTIAL	1.74E-05
	804	March	EXPONENTIAL	2.07E-05
	858	April	EXPONENTIAL	1.94E-05
	1114	May	EXPONENTIAL	1.50E-05
	1088	June	EXPONENTIAL	1.53E-05
	1,102	July	EXPONENTIAL	1.51E-05
	1,288	August	EXPONENTIAL	1.29E-05
	1,415	September	EXPONENTIAL	1.18E-05
	1,355	October	EXPONENTIAL	1.23E-05
	1,355	November	EXPONENTIAL	1.23E-05
	930	December	EXPONENTIAL	1.79E-05
HighTSR	427	January	EXPONENTIAL	3.90E-05
	644	February	EXPONENTIAL	2.59E-05
	508	March	EXPONENTIAL	3.28E-05
	455	April	EXPONENTIAL	3.66E-05
	583	May	EXPONENTIAL	2.86E-05
	554	June	EXPONENTIAL	3.01E-05
	1223	July	EXPONENTIAL	1.36E-05
	853	August	EXPONENTIAL	1.95E-05
	731	September	EXPONENTIAL	2.28E-05
	691	October	EXPONENTIAL	2.41E-05
	590	November	EXPONENTIAL	2.82E-05
	901	December	EXPONENTIAL	1.85E-05

H5 TSR Duration (Model Inputs)

Group	Expected TSR Duration (hours)	Distribution	Rate	Upper Bound (hours)
LowTSR	699	EXPONENTIAL	2.38E-05	8,760
MidTSR	838	EXPONENTIAL	1.99E-05	8,760
HighTSR	857	EXPONENTIAL	1.95E-05	8,760

H6 TSR Penalty (Model Inputs)

Group	Expected TSR Impact (minutes)	Distribution	Parameter	Value (minutes)
LowTSR	2.39	WEIBULL	alpha	1.411
			beta	2.628
MidTSR	2.11	WEIBULL	alpha	1.512
			beta	2.342
HighTSR	1.92	WEIBULL	alpha	1.689
			beta	2.156

H7 TSR Delay – Section Level

TSR values represent the median 50th percentile (P50) across the five-year assessment period.

System	Line	Model Section Name	Model Outputs		Model Inputs
			TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
Newlands-GAPE	1. M.L. - Collinsville to Pring	sPring2ToBuckley1	2.6	31%	LowTSR
		sBuckley2ToArmuna1	1.6	42%	MidTSR
		sArmuna2ToAberdeen1	1.8	20%	LowTSR
		sAberdeen2ToBinbee1	2.3	31%	LowTSR
		sBinbee2ToBriaba	1.1	16%	LowTSR
		sBriabaToPelicanCreek	2.0	16%	LowTSR
		sPelicanCreekToAlmoola	2.5	21%	LowTSR
		sAlmoolaToCollinsville1	2.1	23%	LowTSR
	1A: B.L. - Pring to Abbot Point	sAbbotPointJunctionToKaili	1.9	24%	LowTSR
		sKailiToDurroburra	1.2	8%	LowTSR
		sDurroburraToPring1			NoTSR
	1B: B.L. - Newlands Junction to Collinsville	sCollinsville2ToMcNaughtonJunction	1.7	13%	LowTSR
		sMcNaughtonJunctionToSonomaJunction	1.9	21%	LowTSR
		sSonomaJunctionToBirralee1	2.0	19%	LowTSR
		sCockool2ToHavilah1	2.0	34%	MidTSR
		sHavilah2ToAdaniCarmichaelJunction	1.8	33%	MidTSR
		sAdaniCarmichaelJunctionToNewlandsJunction	0.9	22%	LowTSR
	2A: B.L. - North Goonyella Junction to Newlands Junction	sNewlandsJunctionToLeichhardtRange1			NoTSR
		sLeichhardtRange2ToByerwenJunction	2.2	11%	LowTSR
		sByerwenJunctionToSuttorCreek1	2.3	17%	LowTSR

System	Line	Model Section Name	Model Outputs: TSR delay (minutes)	Model Outputs: TSR Duration (Proportion of time in a year during which TSR delay is applied)	Model Inputs: TSR Group
		sSuttorCreek2ToEaglefieldCreek1	2.3	16%	LowTSR
Goonyella	3. M.L. - Coppabella to Jilalan	sJilalan2ToYukan1	2.3	18%	LowTSR
		sYukan2ToBlackMountain	1.7	45%	HighTSR
		sBlackMountainToHatfieldChoke	1.8	39%	MidTSR
		sHatfieldChokeToHatfield1	1.4	41%	MidTSR
		sHatfield2ToBolingbroke	2.2	57%	HighTSR
		sBolingbrokeToBalook	1.6	57%	HighTSR
		sBalookToWandoo	1.6	34%	MidTSR
		sWandooToWaitara1	1.1	22%	LowTSR
		sWaitara2ToBraeside	1.5	48%	MidTSR
		sBraesideToMindi	1.5	32%	MidTSR
		sMindiToSouthWalkerJunction	1.6	27%	MidTSR
		sSouthWalkerJunctionToTootoolah	2.2	19%	LowTSR
		sTootoolahToMacarthurJunction	1.9	31%	MidTSR
		sMacarthurJunctionToCoppabella1	2.1	20%	MidTSR
	3A: B.L. - Jilalan to Port of Hay Point	sDalrympleCrossoverPointsToDalrympleBayEntry			NoTSR
		sDalrympleCrossoverPointsToPraguelands	1.3	45%	MidTSR
		sPraguelandsToJilalan1	3.1	18%	LowTSR
	3B: B.L. - Hail Creek Mine to South Walker Creek Junction	sSouthWalkerJunctionToBidgerleyJunction	1.7	11%	LowTSR
		sBidgerleyJunctionToBeeCreekJunction			NoTSR
		sBeeCreekJunctionToHailCreekBalloon			NoTSR
	3C: B.L. - Oaky Creek Junction to Coppabella	sMoorvaleJunctionToIngsdon1	2.3	30%	LowTSR
		sIngsdon2ToMillenniumJunction	1.7	38%	MidTSR

System	Line	Model Section Name	Model Outputs: TSR delay (minutes)	Model Outputs: TSR Duration (Proportion of time in a year during which TSR delay is applied)	Model Inputs: TSR Group
		sMillenniumJunctionToRedMountain1	2.0	41%	MidTSR
		sRedMountain2ToOliveDownsSouthJunction	1.7	21%	LowTSR
		sOliveDownsSouthJunctionToWinchester1			NoTSR
		sWinchester2ToPeakDowns1	1.4	45%	MidTSR
		sPeakDowns2ToHarrow1	2.4	30%	MidTSR
		sHarrow2ToSaraji1	2.3	13%	LowTSR
		sSaraji2ToDunsmure1	1.7	30%	MidTSR
		sLakeVermontJunctionToDysart1	2.5	26%	LowTSR
		sDysart2ToStephens1	1.3	34%	MidTSR
		sStephens2ToNorwichPark1	1.4	30%	LowTSR
		sNorwichPark2ToSiennaJunction	1.9	47%	MidTSR
		sBundoora2ToGermanCreekJunction	1.5	19%	LowTSR
		sDunsmure2ToLakeVermontJunction	2.1	38%	MidTSR
		sMiddlemountJunctionToBundoora1	2.7	18%	LowTSR
		sOakyCreekPassingLoop2ToGregoryJunction	1.7	21%	LowTSR
	3D: B.L. - Coppabella to Wotonga	sCoppabellaAngleWestToBroadlea1	1.5	49%	HighTSR
		sBroadlea2ToCarboroughDownsJunction	2.9	22%	LowTSR
		sCarboroughDownsJunctionToMallawa	1.6	40%	MidTSR
		sMallawaToIsaacPlainsJunction	2.1	12%	LowTSR
		sIsaacPlainsJunctionToWotonga	1.5	22%	LowTSR
	3E: B.L. - North Goonyella Mine to Wotonga	sWotongaAngleNorthToMoranbahNorthPassingLoop1	1.8	43%	HighTSR
		sMoranbahNorthJunctionToGrosvenorWestJunction	2.9	12%	LowTSR
		sGrosvenorWestJunctionToFisherCreekJunction	1.9	18%	LowTSR

			Model Outputs		Model Inputs
System	Line	Model Section Name	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
		sFisherCreekJunctionToGoonyellaJunction	2.8	24%	LowTSR
		sGoonyellaJunctionToRiverside1	2.1	18%	LowTSR
		sRiversideJunctionToMabbinCreekJunction	3.1	12%	LowTSR
		sMabbinCreekJunctionToNorthGoonyellaJunction	3.2	24%	LowTSR
	3F: B.L. - Blair Athol Mine to Wotonga	sWotongaAngleSouthToMoranbah1	1.7	22%	LowTSR
		sMoranbah2ToCavalRidgeJunction	2.8	19%	LowTSR
		sCavalRidgeJunctionToCarmichaelBranchJunction	1.2	11%	LowTSR
		sCarmichaelBranchJunctionToVillafranca1	1.7	27%	LowTSR
		sVillafranca2ToMountMcLaren1	1.7	16%	LowTSR
		sMountMcLaren2ToBlackridge1	2.5	43%	MidTSR
		sBlackridge2ToBlairAtholGrainlineJunction	3.9	14%	LowTSR
		sBlairAtholGrainlineJunctionToBlairAtholJunction	2.1	25%	LowTSR
Blackwater	4. M.L. - Bluff to Callemondah	sWigginsIslandJunctionToYarwun	1.9	44%	HighTSR
		sYarwunToAldoga1	2.8	19%	LowTSR
		sAldoga2ToEastEndJunction	1.8	51%	MidTSR
		sEastEndJunctionToMtLarcom1	1.4	40%	MidTSR
		sMtLarcom2ToAmbrose	2.4	13%	LowTSR
		sAmbroseToEpala1	2.7	47%	MidTSR
		sEpala2ToRaglan1	1.8	35%	MidTSR
		sRaglan2ToTwelveMileCreek	1.8	28%	MidTSR
		sTwelveMileCreekToMarmor	1.9	40%	MidTSR
		sMarmorToBajool1	2.3	49%	MidTSR
		sBajool2ToArcher	1.5	26%	MidTSR

System	Line	Model Section Name	Model Outputs: TSR delay (minutes)	Model Outputs: TSR Duration (Proportion of time in a year during which TSR delay is applied)	Model Inputs: TSR Group
		sArcherToMidgee	2.3	38%	MidTSR
		sMidgeeToRocklands1	1.4	64%	HighTSR
		sRocklands2ToSheepwash	2.0	35%	LowTSR
		sSheepwashToGracemere	1.3	17%	LowTSR
		sGracemereToScrubbyCreek	1.9	20%	LowTSR
		sScrubbyCreekToKabra1	1.9	11%	LowTSR
		sKabra2ToWarren	1.3	17%	LowTSR
		sWarrenToKennedyCreek	1.9	39%	HighTSR
		sKennedyCreekToWycarbah	1.8	60%	HighTSR
		sWycarbahToWestwood1	1.8	47%	MidTSR
		sWestwood2ToWindah1	2.3	46%	MidTSR
		sWindah2ToGrantleigh1	1.5	47%	HighTSR
		sGrantleigh2ToCutting	1.7	22%	MidTSR
		sCuttingToTunnel	1.6	34%	MidTSR
		sTunnelToEdungalba	1.4	41%	MidTSR
		sEdungalbaToAroona1	2.4	47%	MidTSR
		sAroona2ToDuaringa1	1.8	59%	HighTSR
		sDuaringa2ToWallaroo	1.9	43%	MidTSR
		sWallarooToTryphinia1	1.3	35%	MidTSR
		sTryphinia2ToDingo	2.3	35%	LowTSR
		sDingoToUmolo	3.0	14%	LowTSR
		sUmoloToParnabal	1.9	44%	MidTSR
		sParnabalToWalton	2.5	19%	LowTSR

System	Line	Model Section Name	Model Outputs: TSR delay (minutes)	Model Outputs: TSR Duration (Proportion of time in a year during which TSR delay is applied)	Model Inputs: TSR Group
		sWaltonToBluff1	1.2	41%	MidTSR
	4A: B.L. - Callemondah to Port of Gladstone	sCallemondahEntryToMtMillerCrossover	1.5	12%	LowTSR
		sMtMillerToComalcoJunction	1.5	22%	LowTSR
		sComalcoJunctionToFishermansLandingBalloon			NoTSR
		sMtMillerToWigginsIslandJunction			NoTSR
		sParanaToSouthGladstone	2.3	27%	LowTSR
	4B: B.L. - Burngrove to Bluff	sBluff2ToBoonalPoints	1.9	50%	MidTSR
		sBoonalPointsToBoonal	3.2	20%	LowTSR
		sBoonalToBlackwater1	2.0	28%	MidTSR
		sBlackwaterAngleToTaurusJunction	1.8	31%	LowTSR
		sTaurusJunctionToKoorilgahBalloon	1.7	15%	LowTSR
		sBlackwater2ToSagittarius	1.6	27%	LowTSR
		sSagittariusToCurraghBalloon	2.3	33%	MidTSR
		sSagittariusToRangal	2.6	43%	MidTSR
		sRangalToBurngroveJunction	1.7	43%	MidTSR
	4C: B.L. - Rolleston Mine to Rangal	sRangalToTikardi1	1.9	15%	LowTSR
		sTikardi2ToBoorgoonJunction	2.0	22%	LowTSR
		sBoorgoonJunctionToKinrolaJunction	1.4	42%	MidTSR
		sKinrolaJunctionToKenmare1	1.7	10%	LowTSR
		sKenmare2ToMemooloo1	2.4	39%	MidTSR
		sMemooloo2ToStarlee1	1.9	62%	HighTSR
		sStarlee2ToMeteorDownsSouthJunction	2.2	16%	LowTSR
		sMeteorDownsSouthJunctionToRollestonBalloon	1.1	10%	LowTSR

			Model Outputs		Model Inputs
System	Line	Model Section Name	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
	4D: B.L. - Oaky Creek Junction to Burngrove	sGregoryJunctionToYanYan2	1.1	16%	LowTSR
		sYanYan2ToKestrelBalloon	2.7	18%	LowTSR
		sYanYan1ToFairhill1	1.2	30%	MidTSR
		sFairhill2ToEnshamJunction	2.9	36%	LowTSR
		sEnshamJunctionToCrew1	1.9	43%	MidTSR
		sCrew2ToWashpoolJunction	1.7	26%	LowTSR
		sWashpoolJunctionToBurngroveJunction	3.6	17%	LowTSR
Moura	5. M.L. - Dumgree to Callemondah	sByelleeToStowe1	1.5	36%	MidTSR
		sStowe2ToGraham	2.2	6%	LowTSR
		sGrahamToStirrat1	2.3	7%	LowTSR
		sStirrat2ToClarke1	2.0	40%	MidTSR
		sClarke2ToFry1	1.4	31%	MidTSR
		sFry2ToMtRainbow1	1.9	16%	LowTSR
		sMtRainbow2ToDumgree1	2.0	36%	LowTSR
	5A: B.L. - Dumgree to Earlsfield	sDumgree2ToBoundaryHillJunction	2.1	11%	LowTSR
		sBoundaryHillJunctionToAnnandale1	2.5	33%	LowTSR
		sAnnandale2ToEarlsfield	2.1	29%	MidTSR
	5B: B.L. - Earlsfield to Callide	sEarlsfieldToKoonkool1			NoTSR
		sKoonkool2ToDakenba1	1.5	17%	LowTSR
		sDakenba2ToCallideBalloon	1.4	48%	MidTSR
	5C: B.L. - Earlsfield to Moura	sEarlsfieldToBelldeen1	1.3	39%	MidTSR
		sBelldeen2ToMouraJunction	2.3	14%	LowTSR
		sMouraJunctionToBaralabaJunction	2.6	31%	LowTSR

H8 Cancellations and Yard Delays - Duration (Model Inputs)

coal system	Yard	Cancellation Wait Type	Expected cancellation wait delays (minutes)	Cancellation wait times duration distribution			
				Distribution	Rate	Lower bound (minutes)	Upper bound (minutes)
Newlands-GAPE	BRC / Pring	Long delay	1080	EXPONENTIAL	9.26E-04	720	1,440
		Short delay	90	EXPONENTIAL	1.11E-02	30	150

H9 Cancellation and Yard Delays - Frequency (Model Inputs)

coal system	Yard	Cancellation Wait Type	Expected cancellation wait frequency (number trips)	Cancellation wait frequency distribution		
				Distribution	Lower bound (number trips)	Upper bound (number trips)
Newlands-GAPE	BRC / Pring	Long delay	20	UNIFORM	15	25
		Short delay	10	UNIFORM	5	15

Appendix I: Above Rail Parameters

The following data relates to above rail operators that is used in the Model.

I1 Consists

The following are the actual consist types and numbers in the CQCN and the unconstrained numbers used in the DNC modelling:

[redacted]

I2 Crew Change Locations (Model Inputs)

The following details where crew changes are allowed for in the Model. At various stages in this cycle, crew changes will take place. These occur most commonly at depots, TLOs and/or staging points such as Coppabella, Bluff and Kabra, but actual locations depend on the individual cycle.

[redacted]

I3 Above Rail Maintenance per Depot Assumptions (Model Inputs)

The following parameters are used by the Model for above rail maintenance activities per operator. Where these activities occur off AN's rail infrastructure they are not explicitly included in the model.

[redacted]

[redacted]

I4 Mine to Fleet Relationships (Model Inputs)

Assumptions used in the model regarding which rail operators service a particular mine/system combination. A single operator is considered when one rail operator handles 80% of train services in a year. If no single operator provides 80% of the services, it is classified as a multiple operator with all current operators servicing that mine included.

[redacted]

[redacted]