APPENDIX L

Rail transport assessment

Cobbora Holding Company Pty Limited

EMM
EMGA Mitchell McLennan

Rail transport assessment

Cobbora Coal Project

Prepared for Cobbora Holding Company Pty Limited | 14 September 2012

Ground Floor, Suite 01, 20 Chandos Street
St Leonards, NSW, 2065

T +61 2 9493 9500
F +61 2 9493 9599
E info@emgamm.com

emgamm.com

Rail transport assessment

Final Draft

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Prepared by	**Tim Brooker**	Approved by	**Phil Towler**
Position	Associate – Transport Planning	Position	Associate Director
Signature		Signature	
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EMM
EMGA Mitchell McLennan

T +61 (0)2 9493 9500 | F +61 (0)2 9493 9599

Ground Floor | Suite 01 | 20 Chandos Street | St Leonards | New South Wales | 2065 | Australia

emgamm.com

Executive Summary

ES1 The scope of this report

The Cobbora Coal Project (the Project) is an open cut coal mine proposed by Cobbora Holding Company Pty Limited (CHC). The mine will supply up to 9.5 Mtpa of thermal coal, primarily to power stations in NSW. In addition, approximately 2.5 Mtpa will be produced for export or for the spot domestic market.

The Project will include an open cut coal mine, a coal handling and preparation plant (CHPP), mine infrastructure area, stockpiles and train loading facility. Construction is planned to commence in mid 2013. Mine operations will start in the first half of 2015. A mine life of 21 years is proposed, with peak production proposed to be reached by 2020.

The proposed rail transport route for the product coal passes through a variety of undeveloped rural, settled agricultural, suburban and densely populated urban environments. The environmental assessment of the proposed rail transport operation has considered:

- rail timetable capacity in the years 2012, 2017 and 2021, including a comparison of the projected future coal transport demand for the Project (and other known mining operations) in comparison to the likely availability of train paths for coal transport on the Australian Rail Track Corporation (ARTC) and RailCorp rail networks;
- road and rail traffic safety and waiting times at level crossings; and
- the management of related environmental impacts (control of noise and dust emissions). This is primarily addressed in the two specialist reports for these topics, the relevant findings of which are noted in this report.

This report responds to the rail transport-related Director General's environmental assessment requirements (DGRs) for the Project. Consultation has been undertaken via meetings and correspondence with the three principal government agencies which are responsible for the planning and operation of passenger and freight train movements on the ARTC Hunter Valley and RailCorp Sydney to Newcastle lines.

The two rail network operators, ARTC and RailCorp, were consulted regarding the Project DGRs relating to train operating issues such as future train lengths, axle load limits, train path capacity, level crossing safety and waiting times and how noise and dust control are currently managed by the rail network and the train operators. Transport for NSW was also consulted in relation to future rail network upgrading strategies.

ES2 Existing rail network and utilisation

The existing rail network is shown on the map in Figure E.1. The coal transport route is as follows:

- new rail spur line from the Gulgong-Dunedoo rail line at Tallawang, 28 km in length, including balloon loop;
- ARTC Tallawang to Ulan line, 45 km;
- ARTC Ulan to Sandgate/Port Waratah and Woodville Junction (Newcastle) lines, 275 km to 280 km; and

- RailCorp Sydney to Newcastle line from Woodville Junction to Eraring and Vales Point, 45 km.

The capacity of the ARTC rail network for coal transport increases progressively east of Ulan. The construction of three additional passing loops at Bengalla, Yarrawa and Wilpinjong on the single track Muswellbrook to Ulan line has recently been completed. The Muswellbrook to Ulan line now has a total of twelve passing loops, relatively uniformly spaced at approximately 10 km to 15 km intervals. On the double track sections east of Muswellbrook, additional tracks are now also being provided on the steeper gradients and on the busier sections near Maitland to improve the timetable headway and thus the route capacity.

Currently, the limiting capacity of sections of the route for coal transport in 2012, are as follows:

- Bylong to Mangoola: current capacity is 14 coal train paths per day, current average utilisation is 11 coal trains per day in each direction (79%);

- Bengalla to Muswellbrook: current capacity is 21 coal train paths per day, current average utilisation is 16 coal trains per day in each direction (76%);

- Muswellbrook to Antiene: current capacity is 47 coal train paths per day, current average utilisation is 24 coal trains per day in each direction (51%); and

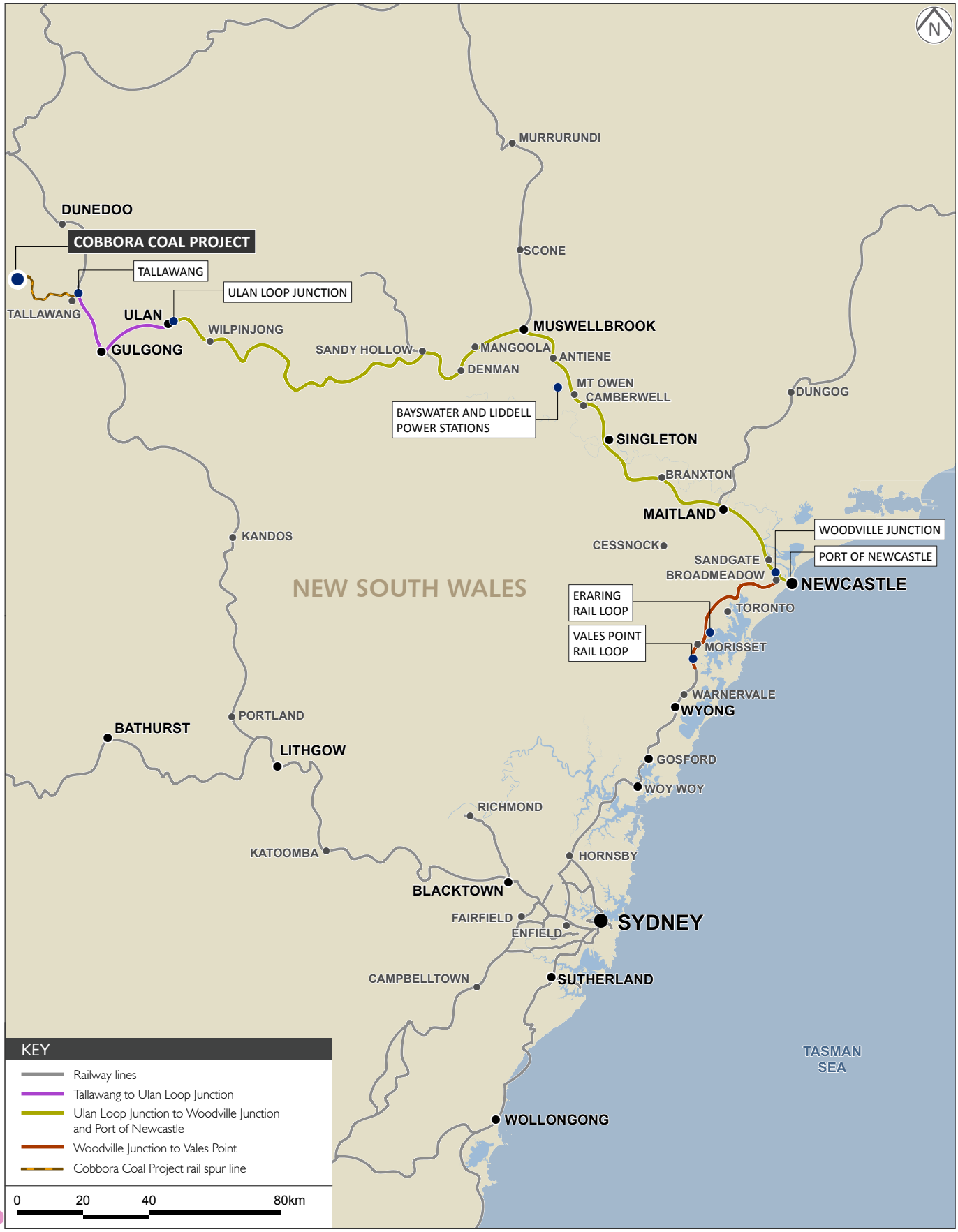
- Newcastle Ports: current capacity is 103 coal train paths per day, current average utilisation is 67 coal trains per day in each direction (65%).

On the RailCorp lines south of Woodville Junction, the existing rail network carries a wide range of freight between Sydney and Newcastle including interstate freight, steel, cotton, grain, mineral ore, cement clinker and other general freight. There was also, prior to 2007, domestic coal transport over the RailCorp lines to Eraring and Vales Point power stations from both the Hunter Valley and Western coalfields.

The future capacity of the RailCorp lines for coal transport has been assessed based on the normal weekday situation. There are fewer passenger trains operating on weekends. It has therefore been assumed that where there is capacity to accommodate the projected increase in coal trains on weekdays, there will also be capacity on weekends.

There are 25 to 26 general freight train paths per day in each direction currently defined in the 2012 RailCorp freight working timetable on weekdays. These general freight train paths all operate over the full length of the route from Enfield/Chullora in Sydney to Woodville Junction in Newcastle although a maximum of 15 to 16 (63%) in each direction are normally occupied on any particular weekday.

For the local Newcastle and Central Coast area coal transport task, there are additional export coal train paths defined in the 2012 RailCorp timetable (11 to 12 per day in each direction) which only apply within the Newcastle area, between the port and Teralba, Newstan and Eraring loops. The current average annual utilisation of these 11 to 12 coal train paths per day is three coal trains per day in each direction (25% utilisation) although up to 10 loaded coal trains per day can operate at peak times.



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Rail Network Map Showing Proposed Coal Transport Routes

Cobbora Coal Project - Rail Transport Assessment

Figure E.1

ES3 Rail network improvements

In recognition of the growing demand for coal and other freight transport, there are a range of rail network and timetable improvements currently identified. The principal ones are the Ulan, Gulgong and Tallawang line improvements and additional passing loops and third tracks along the ARTC route between Ulan and Newcastle.

The current capacity improvement works in the Northern Sydney Freight Corridor Strategy for RailCorp's Sydney to Newcastle route are all located south of Gosford as this is the most capacity constrained section of the route. The main RailCorp tracks from Newcastle to Vales Point Junction, south of Morisset, are currently rated for 30 tonne axle load capacity for coal haulage, but the existing passing loops and sidings along this route at Broadmeadow, Sulphide Junction and Awaba are generally not similarly rated.

In the local Gulgong- Tallawang area, the existing freight train demand is minimal (a maximum of one mineral ore or seasonal grain train per day in each direction). The existing rail track will require upgrading to 30 tonne axle load capacity for coal haulage, an additional passing loop near Gulgong and centralised train control (CTC) is proposed to be installed by ARTC. A preliminary design and costing study for these works has been undertaken by an ARTC design alliance (ARTC Ulan+Alliance, 2009).

Eleven locations for additional passing loops or extensions of existing passing loops are now identified on the ARTC Muswellbrook to Ulan line, mainly on the central "Wilpinjong to Mangoola" section. These works and additional tracks on the Nundah Bank (Mt Owen to Camberwell) and Maitland to Minimbah sections will be completed by 2017, (ARTC, 2012) and will result in capacity increases on most sections of the Hunter Valley network as follows:

- Bylong to Mangoola: capacity will increase from 14 to 26 coal train paths per day;
- Bengalla to Muswellbrook: capacity will increase from 21 to 66 coal train paths per day;
- Muswellbrook to Antiene: capacity will increase from 47 to 118 coal train paths per day; and
- Newcastle Ports: capacity will increase from 103 to 160 coal train paths per day.

On the RailCorp Sydney to Newcastle line, the current program of freight train capacity improvement works (the Northern Sydney Freight Corridor works) which are to be completed by 2015 are primarily proposed to occur either within the Sydney Metropolitan area (at North Strathfield to Flemington and Epping to Pennant Hills) or at Gosford.

By the same year, additional improvements works such as new passing loops may also need to be implemented by RailCorp on the line between Gosford and Newcastle. Additional passing loops are expected to be required by 2015, to accommodate the predicted future growth in demand for passenger, coal and other types of freight transport on this section of the Sydney to Newcastle rail corridor.

ES4 Future demand for coal transport and implications for rail network capacity

The analysis of proposed additional timetable capacity for coal train paths by the year 2015 on both the ARTC and RailCorp networks shows that the existing line capacity, with the identified improvements, will be sufficient to meet the cumulative additional demand from the Project and other identified coal projects, on all sections of the rail route from Cobbora to Vales Point.

On the ARTC network, the access agreement which was negotiated between the ARTC and the Australian Competition and Consumer Commission (ACCC) will guarantee future access to the Hunter Valley Rail Freight Network for all future coal producers and consumers in the Region (HVAU, 2011).

ES5 Assessment of level crossing safety

Wherever a proposed development will generate either additional traffic using an existing level crossing or change in the composition of traffic (eg more heavy truck traffic) using an existing level crossing, the predicted changes to the risk profile of the crossing must be taken into consideration by the consent authority when it is assessing the development application.

The impact of the additional Project coal trains on the collision risk rate at all the existing active and passively protected level crossings in the Newcastle, Mangoola to Ulan and Ulan-Gulgong-Tallawang areas has been assessed, based on the predicted changes to the daily road and rail traffic volumes. The assessment includes consideration of the accident risk reduction factors where improved level crossing safety protection is installed and the increased safety risk factors at level crossing locations where there are road or rail geometry, visibility or surface condition defects.

The two existing actively controlled level crossings in the Newcastle urban area at Clyde Street, Islington and St James Road, Adamstown have recently been upgraded to the highest level of safety protection which is possible for a level crossing. At these two level crossings, the potential increase in the daily train traffic due to the Cobbora Coal Project (six additional train movements daily) will have no measurable effect on the existing accident collision risk levels which will remain low at approximately 0.01 collisions per year at each crossing.

Future level crossing safety has been assessed at six crossings on major traffic routes on the Mangoola to Ulan section of the proposed coal transport route. The level crossing where the estimated accident collision risk is potentially the greatest is the location with the highest road traffic volume currently, which is the Golden Highway near Denman where there are approximately 2,000 to 3,000 vehicle movements daily. At this location, additional half boom barrier control is recommended which would reduce the estimated collision risk rate from approximately 0.08 per year to approximately 0.05 per year.

In the Ulan, Gulgong and Tallawang areas, the level crossing with the highest road traffic volume currently is the Station Street crossing. At this level crossing, the daily road traffic volume is in the range 1,000 to 3,000 vehicles per day. At this road traffic volume range, the increase in the daily train traffic from two to 12 movements daily will not change the collision risk rate for this type of crossing control (active control with flashing lights but no half boom barriers), which will remain at 0.02 per year approximately.

At the two Ulan area level crossings, which have active control with flashing lights and bells but no half boom barriers, the daily traffic volumes are currently in the range 300 to 1,000 vehicles per day. With the increase in the daily train traffic from two to 12 movements daily the overall risk level per crossing will remain relatively low (eg 0.02 per year approximately) and additional active control measures such as half boom barriers would not be required at these two crossings.

However, at other level crossings on public roads within the Ulan-Gulgong-Tallawang areas, which currently have passive (stop sign) control, the increase in daily train traffic due to the Project will increase the estimated collision risk level at each level crossing from the range 0.02 to 0.04 per year to 0.04 to 0.08 per year typically, depending on the extent of existing road or rail geometry or surface condition defects at each crossing location.

At six identified crossing locations where there will be a higher estimated collision risk level (0.08 per year), the current passive (stop sign) control will require further safety assessment. A detailed formal risk assessment study of these six crossings is recommended to be undertaken by ARTC to confirm the most appropriate further safety treatment at each location, which may be either the implementation of additional active control measures such as flashing lights and bells or alternatively, other road surface condition, visibility or geometry improvements.

At additional minor level crossings which provide access to a number of farms and residential properties in the Ulan, Gulgong and Tallawang areas, the current daily road traffic usage of these crossings is very low and the existing safety collision risk of these crossings is not able to be formally assessed. Some of these "minor" level crossings may be able to be closed in the future, subject to satisfactory alternative vehicular access being able to be provided for the affected properties.

At the other level crossings on railway lines to the west of Tallawang, at Birriwa on the Castlereagh Highway, Dunedoo and Beni (east of Dubbo) on the Golden Highway, there will be no additional coal train traffic as a result of the Project. However, there will be more road traffic, including numerous extra truck traffic movements per day during the peak stages of Project construction.

The existing levels of traffic safety at these highway level crossings are considered to be generally good with no recent reported accidents. The existing level of control at each level crossing (flashing lights) is appropriate for level crossings which have good traffic visibility on both the major road approaches. As the level of rail traffic activity at these level crossing is very low (a maximum of one to two train movements daily), and will not increase as a result of the Cobbora Project coal trains, the future combined road/rail traffic safety collision risk at these level crossings will not change significantly due to the predicted road traffic increases. Further detailed investigation of the safety of these highway level crossings is not required as a result of the Project coal trains.

ES6 Assessment of level crossing waiting times

The road traffic delays and waiting times at railway level crossings have been assessed at railway level crossings in the Newcastle, Mangoola to Ulan and Ulan, Gulgong and Tallawang areas.

A five day survey of all existing train movements at the Adamstown railway level crossing indicated a total daily level crossing closure time of 432 minutes (30% of each day) and a corresponding total daily closure time of 463 minutes (32% of each day) for the higher daily number of trains at the Clyde Street railway level crossing.

The additional trains delivering coal from the Project will typically generate six additional loaded or empty coal train movements each day across both of these level crossings. The additional waiting time for road traffic will be approximately 40 minutes per day which will increase the total length of road closure time to 472 minutes per day (33% of each day) and 503 minutes per day (35% of each day) at the Adamstown and Clyde Street railway level crossings respectively. The future probability of any given vehicle being delayed by a train when crossing the railway line at either of these two level crossings will remain at a one in three chance typically.

Currently, on the Mangoola to Ulan line, with eleven coal trains and one freight train movement per day in each direction (24 train movements in total), there is approximately 154 minutes (10% of each day) of waiting time for road traffic at each level crossing. For a typical resident of the area who may travel across a level crossing twice per day, the current likelihood of being delayed on their journey while a train passes is approximately once every four to five days, ie one and a half times per week typically.

The transport of coal from the Project will typically generate five additional return coal train movements per day across each of the Ulan line level crossings. This will increase the total length of time affected to 219 minutes per day (15% of each day typically) at each of the affected Ulan line level crossings. For a typical resident of the Goulburn River Valley and Bylong Valley areas, the likelihood of being delayed on their journey while a train passes, will increase to approximately one and a half times per week currently to twice per week typically, once the Project has reached full capacity.

In the Gulgong area, the current crossing waiting times are affected by the train control at the northern end of Gulgong Station, where trains can be stopped in a position where they will block the Station Street crossing. However, when the CTC is in place for this line these additional level crossing delays for road traffic will be eliminated. Currently, with one freight train movement per day in each direction (two movements in total) the waiting time is approximately nine minutes per day at each crossing. For a typical resident of the Gulgong area who may travel across a level crossing twice per day, the current likelihood of being delayed on their journey while a train passes at a crossing is approximately once every 80 days, ie four times per year typically.

The transport of coal from the Project will typically generate five additional return coal train movements per day across each of the Gulgong area level crossings. This will increase the total length of time affected to 74 minutes per day (5% of each day) at each crossing. For a typical resident, the likelihood of being delayed on their journey while a train passes will increase to approximately once every 10 days once the Project has reached full capacity.

ES7 Environmental Effects of Rail Transport

Environmental compliance conditions are detailed in the environment protection licences (EPLs) of both ARTC and RailCorp (RailCorp EPA Licence no. 12209). These licences describe the environmental management measures and operating controls, in addition to a number of ongoing research studies and related investigations which are currently being implemented, to manage and reduce the existing impacts of train noise and air quality/dust related impacts from coal transport operations.

CHC will conduct regular compliance noise monitoring which will provide input to adaptive noise management strategies for the Project. CHC will work with ARTC and affected residents to assess and mitigate any significant noise impacts along the Tallawang and Ulan section of the railway line.

Offsite train movements on the main line for planned train movements are predicted to satisfy the relevant daytime noise criteria at all receptors. The night L_{eq} (noise equivalent continuous level) criteria would be satisfied at all but six receptors that are situated within 30 m of the railway during the planned train movement scenario. The L_{max} (maximum sound level) criteria would be satisfied at all but two receptors that are situated within 25 m of the railway. Noise mitigation options have been provided in this report such as barriers, acoustic treatment of dwellings and provision of ventilation to dwellings.

The rail line between Tallawang and Ulan is not currently used for coal transport. Dispersion of airborne particulates along a 5 km section of this line, including through the town of Gulgong, was modelled using the United States Environment Protection Agency (USEPA) transportation dispersion model, 'CAL3QHCR'. The peak 24-hour average total suspended particulates (TSP) concentration of coal particulates emitted from uncovered rail wagons is predicted to be approximately 2 $\mu g/m^3$ within 10 m of the rail line, falling to less than 1 $\mu g/m^3$ 50 m from the line. If it is assumed that PM_{10} (particulate matter with a diameter of 10 micrometers or less) concentration is typically 50% of the TSP concentration (based on the USEPA predictive emission factor for wind entrained particulates from stockpiles), the incremental PM_{10} concentration will be approximately 1 $\mu g/m^3$ within 10 m of the rail line. The results indicate that coal dust levels at the edge of the rail corridor will be below levels that are known to affect amenity.

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Acronyms

ACCC	Australian Competition and Consumer Commission
ALCAM	Australian Level Crossing Assessment Model
ARTC	Australian Rail Track Corporation Limited
CHC	Cobbora Holding Company Pty Limited
CTC	centralised train control – rail signalling system controlled from Broadmeadow in Newcastle
CHPP	Coal handling and preparation plant
CRIA	Country Rail Infrastructure Authority (owner of non - ARTC rural rail infrastructure in NSW)
DECC	Department of Environment and Climate Change (now OEH)
DGRs	Director General's environmental assessment requirements (NSW Department of Planning)
DIPNR	Department of Infrastructure Planning and Natural Resources (now Department of Planning)
EPA	Environment Protection Authority (NSW)
EPL	environment protection licence
HVAU	Hunter Valley Access Undertaking
ITSR	Independent Transport Safety Regulator (post 2009)
ITSRR	Independent Transport Safety and Reliability Regulator (pre 2009)
LCSC	Level Crossing Safety Council (NSW)
LGSA	Local Government and Shires Association NSW
NSWTI	NSW Transport and Infrastructure (former name for Transport for NSW)
OEH	Office of Environment and Heritage (formerly DECC)
RIC	Rail Infrastructure Corporation (former owner of rural rail infrastructure in NSW, now CRIA)
RTA	Roads and Traffic Authority of NSW (now incorporated into RMS)
RMS	Roads and Maritime Services NSW (new name for combined roads and maritime authority)
SEPP	State Environmental Planning Policy
TAL	tonnes axle load limit for a section of rail track
TIA	traffic impact assessment

TSP	total suspended particulates
PM_{10}	particulate matter with a diameter of 10 micrometers or less
L_{eq}	noise equivalent continuous level
L_{max}	maximum sound level

1 Introduction

1.1 Cobbora Coal Project

1.1.1 General

The Cobbora Coal Project (the Project) is a new open cut coal mine proposed by Cobbora Holding Company Pty Limited (CHC). The mine will supply thermal coal, primarily to power stations in NSW. Some coal from the Project will be produced for export or for the spot domestic market.

The Project will include an open cut coal mine, a coal handling and preparation plant (CHPP), mine infrastructure area, stockpiles and train loading facility. Associated infrastructure will include a rail spur line, water supply pipeline, pumping station, access roads, power lines and an electricity substation. Construction is planned to commence in mid-2013. Mine operations will start in the first half of 2015. A mine life of 21 years is proposed.

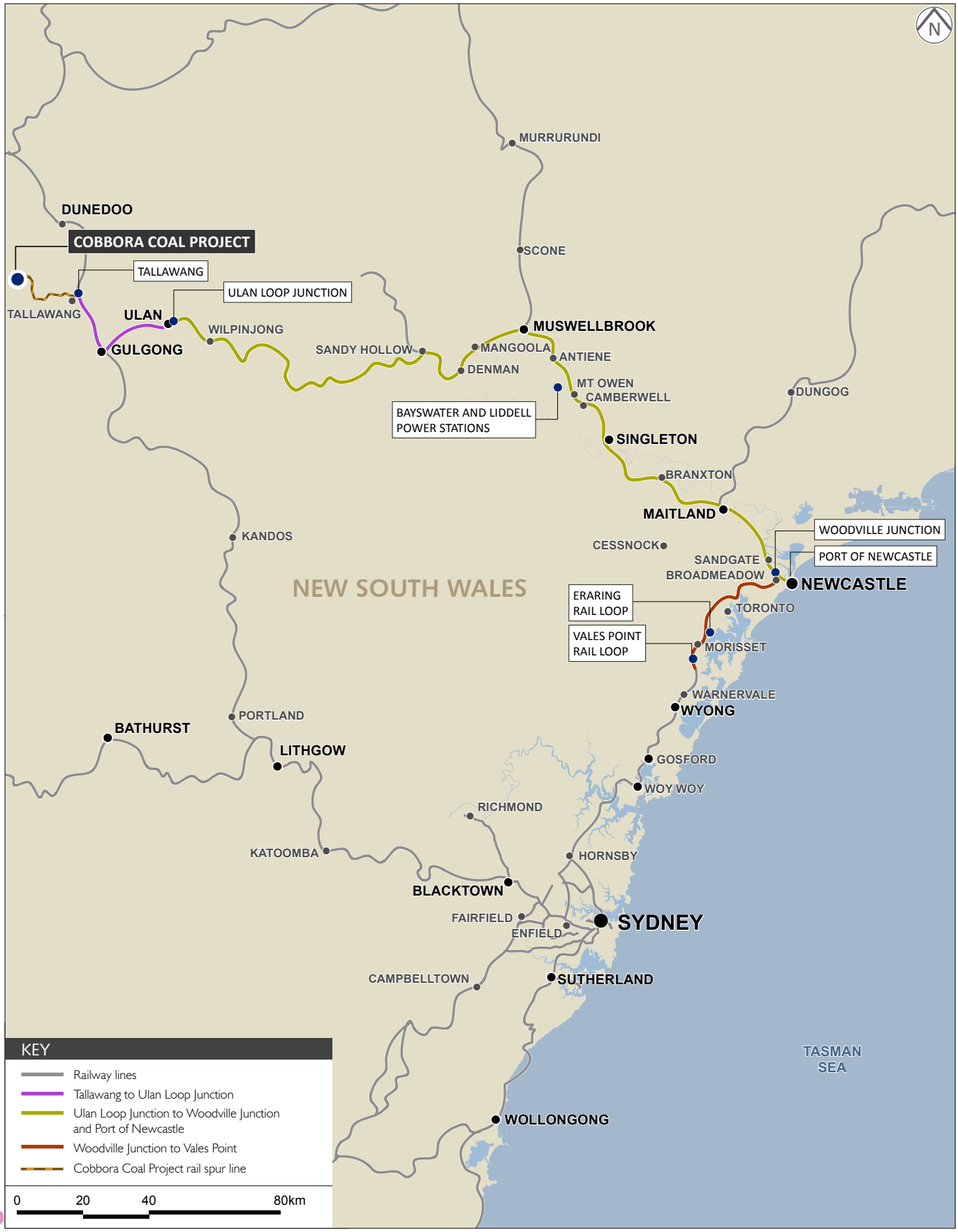
A Major Project application under Part 3A of the *Environmental Planning and Assessment* Act 1979 (NSW) (EP&A Act) was submitted to the NSW Department of Planning on 5 January 2010 (application number MP 10_0001). The Director General's environmental assessment requirements (DGRs) for the Project were issued on 4 March 2010. Revised DGRs were issued for the Project on 23 December 2011 in response to changes in the proposed project and government assessment requirements.

1.1.2 Customers and rail transport routes

The project is being developed to supply 9.5 million tonnes per annum (Mtpa) of coal to five power stations (Table 1.1) to meet contacts signed as part of the GenTrader transactions. The network of proposed rail transport routes is shown on the map in Figure 1.1. Up to 2.5 Mtpa of coal may also be produced for other domestic customers or exported. The distribution between domestic and export sales is unknown as it will depend on spot market domestic sales. This rail transport assessment therefore assumes that 2.5 Mtpa of coal is exported, requiring transport of the coal along the full length of the Hunter Valley Rail Corridor. However, with a strong domestic demand for thermal coal, it is expected that only a small portion of this coal will be exported. The train configurations that will be used are yet to be determined. However, the table below summarises the indicative daily rail movements.

Table 1.1 Cobbora Coal Project customers

Customer	Destinations	Location	Distance by rail from Tallawang (km)	Typical number of loaded coal trains each day at full production
Macquarie Generation	Bayswater and Liddell	Upper Hunter Valley	205	0.95
Origin Energy	Eraring Power Station	Central Coast	346	2.22
Delta Electricity	Vales Point and Munmorah	Central Coast	360	0.77
Other	For export or other domestic sales	Either Port Waratah or Kooragang Island	313 (to Port Waratah junction)	1.00
Total	All			4.94



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Rail Network Map Showing Proposed Coal Transport Routes

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Figure 1.1

The customers (Table 1.1) will select rail hauliers to transport coal from the Project to their power stations. If coal is to be exported, CHC will select rail hauliers to transport coal to the port. The rail hauliers will provide rolling stock and will operate the coal trains. This will include negotiating rail access agreements with Australian Rail Track Corporation Limited (ARTC) and RailCorp. The boundary between the ARTC and RailCorp networks is at Woodville Junction in Newcastle. Discussions with ARTC and RailCorp regarding rail access have started.

At full production, which will occur after 2020, the Project's power station customers will typically require four return train trips each day (eight movements) with minimal variation in demand, 300 days per year. There will also typically be one additional export or spot domestic market coal train to the Upper Hunter Valley or Newcastle area each day.

The majority of the Project's trains are expected to haul between 7,800 to 8,800 tonnes loaded coal and will be between 1,370 m to 1,550 m long. Of the five return train trips per day, approximately 20% will deliver coal to the two Hunter Valley power stations (Bayswater and Liddell) while the remainder will travel on to Newcastle or the power stations on the Central Coast.

1.2 Assessment objectives

This report responds to the transport related DGRs for the Project, Table 1.2, last updated on 23 December 2011:

Table 1.2 Project transport related DGRs

Item	Requirement	Where assessed
1	Detailed assessment of the potential impacts of the Project on the capacity, safety and efficiency of the: • Local and regional rail network having regard to the strategic objectives and cumulative impacts for the passenger and freight rail network • Local and regional road network with particular regard to a cumulative traffic impact assessment, condition assessment of the existing road network, proposed new road infrastructure and impacts of coal trains on level crossing operations	A future railway level crossing safety and risk assessment of all affected railway level crossings in the Gulgong, Tallawang and Ulan areas will be undertaken by ARTC as part of the Gulgong-Tallawang Rail Line Upgrading works (ARTC ULAN + Alliance, 2009) A railway level crossing delay impact assessment for road traffic at nominated crossings in the Newcastle urban area and between Mangoola and Ulan is included in Chapter 5 of this report The road traffic impacts of the Project are assessed for the Project construction and operations stages in a road traffic impact (TIA) assessment report for the Project (EMM, 2012a)

Table 1.2 Project transport related DGRs *(Cont'd)*

Item	Requirement	Where assessed
2	Details of mine to port or other domestic customer transport movements, train path availability, and any required rail infrastructure works	Details of the proposed destinations of the product coal from Cobbora are summarised in Chapter 1 of this report The future availability of coal train paths to transport this coal on both the ARTC and RailCorp networks is discussed and assessed in detail in Chapter 3 and Chapter 4 of this report The future need for infrastructure upgrades on the Hunter Valley and RailCorp lines is generally reviewed annually by ARTC and on as 'as needs' basis by RailCorp The ARTC produces a publicly available 10 year Hunter Valley rail network upgrading strategy which was most recently updated in June 2012. The strategy identifies a specific program of Hunter Valley rail network upgrading works to match the projected growth in demand for coal transport to the year 2021 and a provisional program of future works to 2017 There is no equivalent publicly available rail network upgrading strategy for the RailCorp Sydney to Newcastle line north of Gosford. However, RailCorp has advised that two new passing loops are likely to be required in the Awaba North area by 2015 to improve freight train capacity Additionally, Transport for NSW has advised that within the timeframe of this assessment, before the Project coal trains commence operations in 2015, additional passenger train services will affect the availability of paths for coal train services south of Newcastle
3	A detailed description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road and rail networks in the surrounding area over the life of the Project	Proposed rail transport mitigation measures for the Project are given in Chapters 5, 6 and 7 of this report All crossings of public roads on the new railway spur line for the Project will be grade separated and there will be no new public railway level crossings created as a result of the Project. A grade separated overbridge will be provided for the Castlereagh Highway to pass over the Project rail spur line, near Tallawang Additionally, the existing level crossing safety control measures in the Gulgong-Tallawang and Ulan areas will be reviewed and where necessary, upgraded by ARTC, as part of the Gulgong-Tallawang Rail Line Upgrading works (ARTC ULAN + Alliance, 2009) Proposed road transport mitigation measures for the Project are defined separately in Chapters 5 and 6 of the TIA report (EMM, 2012a)

1.3 Agency consultation

Formal consultation has been undertaken via meetings and correspondence with the three principal government agencies which are responsible for the planning and operations of passenger and freight train movements on the Hunter Valley and Sydney to Newcastle Coast lines, namely:

- Transport for NSW (responsible for all railways in NSW);

- ARTC (responsible for the Hunter Valley Lines including the Muswellbrook to Ulan and Gulgong to Tallawang Lines); and

- RailCorp (responsible for the metropolitan rail network, including the Sydney to Newcastle Line).

Transport for NSW requested an assessment of the impacts of the Project generated coal trains on safety and waiting times for road traffic at railway level crossings in the Newcastle urban area and an assessment of the potential impact of additional coal trains on passenger train capacity and operations in the Sydney to Newcastle rail line corridor.

The two rail network operators (ARTC and RailCorp) were consulted about the applicable DGRs. In addition, information was sought on timetable planning, train lengths, axle load limits, train path capacity, level crossing safety and delays, and how noise and dust control are managed jointly by the rail network owner and the train operators.

ARTC and RailCorp and the four train operators which are currently contracted for coal haulage in NSW (Pacific National, Queensland Rail, Freightliner Australia and Southern Short Haul Rail) have a range of environmental management systems and procedures currently in place. These are subject to approval by the NSW Environment Protection Authority (EPA) and include management of noise and dust generated by rail traffic within the respective rail corridors.

2 Existing rail network

2.1 Overview of the network

The rail network which will be used for the transport of Project coal from the Cobbora train loading facility to the customers and the port has been considered as four sections, as illustrated by the route map (Figure 1.1):

- the rail spur line to the Project;
- Tallawang to Ulan;
- Ulan to Sandgate/Kooragang/Port Waratah and Woodville Junction at Newcastle; and
- Woodville Junction, Newcastle to the Eraring and Vales Point loops.

More detailed route maps of each section of the rail corridor are provided in Appendix A of this report. The length and general operating characteristics of each of the four sections are summarised in Table 2.1.

Table 2.1 Rail network sections to be used for the Project coal transport

Section name	Track owner	Length	Description
Cobbora Coal Project rail spur line from the train loading facility at the mine to the Gulgong-Dunedoo Rail line at Tallawang	CHC	Approximately 28 km including the balloon loop	Primarily to be used by CHC Shows allowance for a train provisioning facility if required
Tallawang to Ulan Balloon Loop Junction	ARTC	Approximately 45 km	The line is currently used to transport magnetite from the Tallawang mine to coal mines in NSW in four train (650 m long) movements per week Ore concentrate is also regularly transported from Cobar and the line is occasionally used for grain transport
Ulan Balloon Loop Junction to Woodville Junction and to the port	ARTC	Approximately 275 km to Sandgate junction and a further 4 km to Woodville Junction The port coal unloaders at Kooragang and Port Waratah are accessed from the main line via junctions at Sandgate and Waratah	The line is used extensively for the transport of coal from mines in the Hunter Valley to the port and other coal users Passenger train services operate on a separate line between Maitland and the port. North of Maitland the line carries coal, passenger and other freight trains Bayswater and Liddell power stations are on this section
Woodville Junction to Vales Point Rail Loop Junction	RailCorp	Approximately 45 km	The line is currently used for passenger services but is shared with freight movements including some coal trains Eraring, Vales Point and Munmorah power stations are on this section

2.2 The Cobbora rail spur line

A rail spur line from Tallawang will be constructed as part of the Project. The rail spur line will pass through a rural area containing a number of rural residences. It will be built in a cutting under the Castlereagh Highway and will cross Laheys Creek Road on a bridge. No new level crossings will be required on either public or private roads.

2.3 ARTC network

2.3.1 Tallawang to Ulan Balloon Loop Junction

The ARTC rail line between Tallawang and the Ulan Balloon Loop Junction passes through relatively sparsely populated rural areas, but passes close to some houses near Gulgong and Ulan.

The current freight train usage of the ARTC line between Tallawang and Ulan is typically no more than one freight train per day in each direction, which is usually a mineral ore train or a grain train in peak season.

This section is crossed by three active rail crossings with lights and bells (Station Street in Gulgong, the Ulan-Gulgong Road and the Ulan Mine Entrance Road), eight passive rail crossings (with stop signs) on public roads, and 11 passive rail crossings on private roads or for farm access.

The requirement for, and the locations of, future rail infrastructure upgrades on this section will be determined by ARTC. The construction and operation of these upgrades will be the subject of existing or future environmental approvals held by the ARTC. There will be no role for the Project in these works other than for indicating the future coal haulage requirement.

2.3.2 Ulan Balloon Loop Junction to Islington Junction and the ports

The ARTC Hunter Valley rail line between the Ulan Balloon Loop Junction and either the Kooragang (Sandgate), Waratah or Woodville Junctions in Newcastle is currently used to transport export coal to the Port of Newcastle and domestic coal between Wilpinjong mine and the Bayswater and Liddell power stations via the Antiene/Drayton coal unloading loop.

The existing coal train movements on the ARTC network in 2012 are illustrated by the cumulative export and domestic coal train demand growth projections for each section of the route in Appendix B. On the section from Bylong to Mangoola, immediately east of the Ulan group of mines, there are currently 11 coal train movements per day on average in each direction which are transporting approximately 27 Mtpa of coal. There are up to 67 coal train movements per day in each direction on all the rail routes leading to Newcastle, which are currently transporting approximately 156 Mtpa of export and domestic coal.

The Hunter Valley rail line passes through a range of rural and suburban areas and also carries significant passenger train traffic as it approaches the Newcastle urban area. The line is crossed by approximately 18 active rail crossings; approximately eleven passive rail crossings on public roads; and an unspecified number of passive rail crossings on private road or farm tracks. The Clyde Street active rail crossing at Islington is the only level crossing along the ARTC section of the coal transport route which is located within the Newcastle urban area.

The Clyde Street crossing is currently used mainly by passenger and general freight trains as the Hunter Valley export coal trains all currently divert from the main line at either Sandgate Junction or Waratah Junction before reaching the Clyde Street level crossing. It is only the export coal trains from mines south of Newcastle (eg Newstan and Teralba) which currently pass through the Clyde Street level crossing.

There is also some domestic coking coal transport between mines at Mt Thorley and Stratford, to and from Port Kembla.

ARTC will continue to manage the train operations on the Hunter Valley line, including and track and infrastructure upgrades and environmental compliance in conjunction with rail hauliers.

2.3.3 ARTC network strategy

As part of the Hunter Valley Access Undertaking (HVAU, 2011) the ARTC will provide access to the ARTC Hunter Valley Lines for all approved coal mining operations for the transport of product coal.

As part of the access agreement, all forecast future coal tonnages to be transported on a particular rail line are aggregated by ARTC and used to determine the typical daily number of train paths required to accommodate the forecast annual tonnage. This analysis also determines:

- a schedule for completing the additional rail infrastructure (eg additional tracks and passing loops) required to provide sufficient daily train paths to accommodate the forecast tonnage; and
- the train sizes which must be used by individual rail hauliers to optimise the operational efficiency of the coal transport network for the mutual benefit of all stakeholders.

i ARTC Statement of Corporate Intent 2011-2012

In response to the strategic economic importance of the Hunter Valley coal train operations to the economy of NSW and Australia, the ARTC is currently implementing a number of major rail corridor infrastructure improvements for the Hunter Valley network including the Muswellbrook to Ulan Line, as discussed below.

In the Hunter Valley, ARTC's objective is to increase rail coal chain capacity and performance to meet port allocations and domestic coal requirements. ARTC is not only committed to ensuring that producers receive value for money from the investments in the network, but also works in collaboration with the industry to identify and facilitate productivity improvements where these require infrastructure investment.

ARTC has been successful to date in providing the required capacity through a number of projects including the Sandgate flyover, duplication between Antiene and Muswellbrook, bi-directional signalling Maitland – Branxton, Ulan line centralised train control, 13 new or extended loops, and the Minimbah Bank third track.

Projects commenced include:

- a third track between Minimbah and Maitland to further reduce the impact of track maintenance on total coal chain throughput, and provide additional surge capacity;
- a third track on Nundah Bank to eliminate the capacity constraint which will emerge on this section as volumes grow;
- up to four holding roads at the entry to the port to effectively manage train queuing and sequencing into the dump stations;
- upgrading of Drayton Junction to increase train speed and reduce maintenance costs;

- a scheme to address the ventilation issues at Bylong Tunnel on the Ulan line which impose a constraint on train frequency;
- four new loops between Muswellbrook and Werris Creek at Koolbury, Burilda, Pages River and Chilcotts Creek; and
- two new loops at Bengalla and Wilpinjong on the Ulan Line.

All of these projects have been subject to coal industry agreement in accordance with the HVAU (2011).

ii ARTC 2012-2021 Hunter Valley Corridor Capacity Strategy

The ARTC has a detailed strategy (ARTC, 2012) which documents the proposed capacity upgrades to the Hunter Valley rail corridor. This strategy is used to plan infrastructure upgrades to meet the forecast future coal transport tonnages (primarily export coal to the port of Newcastle) for a minimum five year future period at all times.

The most recent strategy was prepared in June 2012 and includes a detailed analysis of the existing and future coal transport demand and carrying capacity of the ARTC lines to the year 2021. It provides a detailed program of infrastructure upgrade works for the Hunter Valley lines, to be completed by 2017, to meet projected growth in the corridor coal traffic to the year 2021, while maintaining capacity for passenger and other general freight traffic.

The strategy identifies a separate future works program each year to address the existing and developing capacity constraints on each of three defined ARTC coal transport routes:

- Muswellbrook to Hexham;
- Ulan to Muswellbrook; and
- Narrabri to Muswellbrook.

Coal from the Project is unlikely to be transported on the Narrabri to Muswellbrook line. The coal transport capacity of the Muswellbrook to Hexham route will be significantly improved to meet the predicted future coal transport demand in the years 2017 and 2021 by the identified improvements, primarily the Nundah Bank, Minimbah to Maitland and Drayton Junction improvements.

On the Muswellbrook to Ulan line, the existing coal mines are clustered either near the start of the line around Muswellbrook (Bengalla, Mangoola and Mt Pleasant mines) or near Ulan (Ulan, Wilpinjong and Moolarben mines). There is a 115 km long central section of the Ulan line from Wilpinjong to Mangoola which has relatively homogenous demand currently. Construction of three additional passing loops on the Ulan line at Bengalla, Yarrawa and Wilpinjong has recently been completed. As a result, the line now has a total of twelve passing loops which are relatively uniformly spaced at approximately 10 to 15 km intervals at the following route distances (kilometers from Sydney via Newcastle):

- Bengalla, 292.9 km;
- Mangoola, 305.3 km;
- Yarrawa, 316.9 km;
- Sandy Hollow, 330.5 km;

- Baerami, 343.3 km;
- Kerrabee, 362.1 km;
- Murrumbo, 370.1 km;
- Bylong, 383.0 km;
- Coggan Creek, 396.1 km;
- Wollar, 410.7 km;
- Wilpinjong, 421.3 km; and
- Ulan, 434.3 km.

Eleven more passing loops or extensions of existing passing loops are now identified by ARTC to be constructed on the Ulan line, mainly on the central Wilpinjong to Mangoola section. These works are included in the list of required projects in the current ARTC strategy. This works program (ARTC, 2012), which is summarised in Table 2.2, will significantly increase capacity on all the capacity constrained sections of the Muswellbrook to Ulan and Ulan, Gulgong and Tallawang lines by 2017.

Table 2.2 Summary of Ulan line rail corridor upgrade works

Ulan Line rail corridor works location	Proposed works for contracted tonnage growth, maximum demand 48.5 Mtpa (all works by 2017)	Proposed works for contracted and prospective tonnage growth, maximum demand 59.5 Mtpa (all works by 2017)
296.15 km	Bengalla Loop extension west (to 296.15 km)	
299.1 km		Bengalla Loop extension west (to 299.1 km)
310.5 km		Mangoola West extension (to 310.5 km)
324 km	Additional passing loop (324 km)	
337 km		Additional passing loop (337 km) Baerami East
345 km		Baerami West extension (345 km)
353 km	Additional passing loop (353 km) Widden Creek	
374.1 km	Murrumbo West Loop extension (to 374.1 km)	
377 km		Bylong East extension (to 377 km)
386.7 km	Bylong West Loop extension (to 386.7 km)	
400.7 km		Coggan Creek West extension (to 400.7 km)
Gulgong	Gulgong Loop	
Gulgong-Tallawang	Gulgong-Tallawang CTC	
Gulgong-Tallawang	Gulgong –Tallawang Track Upgrade	

Source: (ARTC, 2012).

iii Freight Corridor Upgrade Study, Tallawang – Wallerawang and Ulan

The *Tallawang to Wallerawang and Ulan Freight Corridor Upgrade Study* (ARTC Ulan+Alliance, 2009) investigated and documented the additional future rail corridor upgrading works which would be likely to be required on the ARTC network west of Ulan, from Tallawang towards Gulgong and Ulan, and from Gulgong towards Wallerawang, to accommodate the potential additional coal transport demand which would be generated by the Project.

The rail corridor south from Gulgong towards Wallerawang is currently out of service and is not currently proposed to be utilised for rail transport from Cobbora or by any other rail transport operator. The necessary works which have been determined by the report for the Tallawang to Gulgong and Ulan section for the Cobbora project coal transport, were generally as follows:

- upgrading the track and ballast to 30 tonnes axle load (TAL);
- extending CTC microlok system from Ulan, through Gulgong to Tallawang, combined with rationalisation of Gulgong Junction trackwork and signalling;
- construction of an additional passing loop located near Gulgong; and
- upgrades to the existing active and passive railway level crossings where required.

2.4 RailCorp network

2.4.1 Existing network

The RailCorp Sydney to Newcastle line between Woodville Junction at Newcastle and the junctions at the two most southerly power stations unloading loops at Eraring and Vales Point passes through a range of urban, suburban and rural areas. There is one level crossing on this section, the St James Road active rail crossing, at Adamstown.

RailCorp will continue to manage the train operations and infrastructure upgrades on this section. The Project's coal haulage requirements to the central coast power stations will impose a new operational and network management paradigm on the line through the requirement to manage up to 1,550 m long trains in combination with 30 TAL axle loadings.

2.4.2 RailCorp network strategy

In recent years, a number of freight strategy investigations have been undertaken for the rail corridor by RailCorp, other government agencies and the Parliament of NSW.

i North South Rail Corridor Study

The *North-South Rail Corridor Study – Detailed Study Report* (DoTARS, 2006) investigated a large number of potential rail corridor improvements, new alignments and deviations for four potential Melbourne to Brisbane rail routes which could potentially be developed to serve as the primary east coast, north-south rail transport route. The four potential routes were defined as the:

- Far Western Sub-Corridor;
- Central Inland Sub-Corridor;
- Coastal Sub-Corridor; and
- Hybrid Sub-Corridor.

Of the four routes, only the Coastal Sub-Corridor included the existing Sydney to Newcastle rail line is part of the primary north-south route. The Hybrid Sub-Corridor route included the Maitland to Muswellbrook line and potentially the Muswellbrook to Werris Creek line as part of an inland deviation from Maitland to Junee which would avoid the need for Melbourne to Brisbane freight trains to travel through Sydney. All the four route corridor options were assessed using a future freight transport demand model, a rail operating cost model, a rail access revenue model and an environmental externality cost model to determine whether major route investment, at a capital cost of over $1.5 billion, could be either economically or financially justifiable. However, none of the four corridors were considered to be able to potential generate the necessary route travel time savings to attract sufficient future time-sensitive freight transport demand to the route to justify the proposed level of infrastructure investment at commercially competitive discount rates.

The study nevertheless identified the major rail freight transport capacity constraints which affect the route currently, which included the Cowan Bank, north of Sydney and the Sydney Metropolitan area freight train curfew, which has existed since 1985, which prevents freight train access to the RailCorp passenger tracks between 6.00 am and 8.30 am and 2.30 pm and 6.00 pm on weekdays.

The current Northern Sydney Freight Corridor Strategy (Minister for Infrastructure and Transport, 2011) works are proposed to address the freight train curfew and to a lesser extent the Cowan Bank constraint, with additional dedicated rail freight lines and passing loops.

The study also identified potential longer term trends for up to 27% of grain freight transport and 50% of cotton freight transport from Northern NSW to divert to the Port of Brisbane with potential changes to rail freight access charges and/or rail corridor infrastructure improvements on the inland rail corridor routes to Brisbane.

ii Lower Hunter Transport Needs Study – Freight Transport Technical Report

The *Lower Hunter Transport Needs Study, Technical Paper 2, Freight Transport* (NSW Premiers Department, 2008) assessed the current and projected future freight transport requirements in the Lower Hunter Region of NSW including the coal, grain, cement, minerals, interstate freight and other general freight capacity requirements.

The future potential development of an international container port at Newcastle was also investigated. This would provide future additional container import/export capacity for NSW, once the three million per year container handling capacity limit at Port Botany is exceeded. The potential additional port related container traffic at Newcastle was investigated in conjunction with a proposed freight hub facility near Hexham. This traffic was identified as generating a potential demand in the longer term for seven additional container shuttle trains to operate each way per day between Sydney and Newcastle.

Although the rail network south of Newcastle was considered to be performing only a small role in the general freight transport task in the region currently, significant additional rail freight traffic on the passenger rail network was considered at that time (NSW Premiers Department, 2008) to potentially impact on the network's future ability to respond to increasing passenger traffic demand.

iii NSW Parliament Briefing Paper - Rail Freight Transport in NSW

The *Rail Freight Transport in NSW briefing paper* (NSW Parliament Library, 2009) presents an overview and summary of the key demand growth factors, financial constraints and environmental constraints which currently affect rail freight transport in NSW. The issues covered include:

- the increasing volume of freight movements in the Sydney Region and the Sydney to Brisbane Corridor by 2025;
- the recent historical inequity in the funding of road and rail transport infrastructure;
- the greater flexibility offered for the transport of most commodities by road transport;
- traffic congestion and safety issues associated with road freight transport;
- noise and air pollution issues associated with road and rail freight transport;
- improving the efficiency of rail freight transport, including corridor upgrading strategies;
- the reopening of some disused rural rail freight lines, eg for grain transport; and
- alternative uses (eg rail trail cycleways) for other disused rail lines.

The proposed Southern Sydney and Northern Sydney Freight Corridor works were reported as being necessary to meet the strategic objective of reducing current delays to freight trains by separating freight lines from suburban passenger services within the Sydney metropolitan area.

The operational efficiency of interstate and other general rail freight services is significantly compromised by the current morning and afternoon three hour peak period curfews which apply to freight train services within the Sydney metropolitan area where freight trains need to share tracks with suburban passenger train services.

iv RailCorp Corporate Plan 2011-2016

RailCorp provides train services under the requirements of the NSW *Transport Administration Act 1988*. In addition to its requirement to provide passenger train services and maintain rail infrastructure, RailCorp must provide and promote access to its rail network for third party rail operators which currently represent a total of 19 freight, long distance passenger and heritage train service operators.

RailCorp provides passenger rail services under a contract from the Director General of Transport for NSW, and must meet specified requirements for service levels, undertake regular service reviews and undertake community consultation regarding all service changes or interruptions.

A number of significant passenger train service improvements are due to be completed by RailCorp over the next ten years from 2011:

- completion of the $2 billion Rail Clearways Project;
- completion of the North West Rail Link;
- completion of the South West Rail Link; and
- completion of the delivery of new air conditioned carriages including the Waratah and Oscar trains.

v NSW Government announcement of Northern Sydney Freight Corridor 2011

In December 2011, the NSW Government announced the commencement of construction on the Northern Sydney Freight Corridor works program.

Three major infrastructure improvements to the Northern Sydney Freight corridor lines at a total cost of $1.1 billion will commence construction during 2012. These works will increase the daily freight train path capacity on the Sydney-Newcastle line from approximately 29 freight train paths per day in each direction currently to 44 freight train paths per day in each direction when the works are completed by 2016. The rail infrastructure works are being undertaken at:

- North Strathfield Underpass, grade separation for southbound freight trains heading towards Flemington, work commencing in February 2012 and due to be completed by October 2015;
- Epping to Pennant Hills, a third track, for northbound freight trains, work commencing in March 2012 and due to be completed by June 2016; and
- Gosford, one passing loop in each direction to allow fast trains to overtake slower trains, work commencing in May 2012, due to be completed by April 2015.

On the RailCorp Sydney to Newcastle line, the current program of freight train capacity improvement works (the Northern Sydney Freight Corridor works) are primarily proposed to occur either within the Sydney Metropolitan area (at North Strathfield to Flemington and Epping to Pennant Hills) or at Gosford.

It is likely that, when these works are close to completion, some additional improvement works to freight train passing loops may also be implemented on the RailCorp line between Gosford and Newcastle, for example at Awaba North, to accommodate the predicted growth in demand for passenger, coal and other types of freight transport.

2.5 Train operations

2.5.1 ARTC network train paths and timetabling

On the Hunter Valley lines of the ARTC network, coal trains are the most common type of train. An extensive program of Infrastructure improvements are planned to the rail corridor between Muswellbrook and Maitland which will eventually provide coal train paths at 10 minute intervals on most sections of the route over the major part of the day.

These improvements will result in a typical future capacity of at least 110 coal train paths per day in each direction on all sections of the ARTC network south of Antiene/Drayton Junction, where the Bayswater and Liddell power station loops are located. These train paths will provide coal transport capacity of over 300 Mtpa on all sections of the network south of Antiene/Drayton Junction (ARTC, 2012).

2.5.2 RailCorp network train paths and timetabling

On the RailCorp Sydney to Newcastle line, the capacity for either domestic or export coal transport is much more constrained than on the ARTC Hunter Valley lines.

The future capacity of the RailCorp lines for coal transport has been assessed based on the normal weekday situation. There are fewer passenger trains operating on weekends. It has therefore been assumed that where there is capacity to accommodate the projected increase in coal trains on weekdays, there will also be capacity on weekends.

In recent years there have been approximately 25 or 26 freight train paths each way per day defined on weekdays, for all types of freight trains over the full length of the Sydney to Newcastle line. Just over half of these are normally used on a typical weekday by the following types of freight trains:

- interstate freight container trains, operating between Sydney and Brisbane or Melbourne and Brisbane;
- steel trains operating between Whyalla, Port Kembla, Newcastle and Brisbane;
- grain and flour trains operating between Gunnedah and Bomaderry or Clyde;
- cotton trains operating between Narrabri and Enfield or Botany;
- general freight trains operating between Goulburn, Sydney, Newcastle and Tamworth;
- export ore trains operating between Blayney and Newcastle; and
- various domestic coal and cement trains operating between origins and destinations outside the Sydney to Newcastle Corridor, including the Mt Thorley and Stratford mines and the BHP Steelworks at Port Kembla.

In the 2012 RailCorp Freight Working Timetable for the line, which is shown in Appendix C, there are either 25 or 26 weekday freight train paths defined in each direction, which operate over the full length of the corridor from Enfield/Chullora in Sydney to Broadmeadow/Woodville Junction in Newcastle. A maximum of 15 or 16 of these freight train paths (63%) are normally used by existing rail operators each weekday. This leaves an average of at least 10 spare freight train paths which are generally available in each direction on each weekdays, of which at least eight (northbound) and four (southbound) are currently continuously available on all five weekdays as shown in Table 2.3.

The currently used freight train paths and the spare RailCorp freight train paths which are currently available over the full length of the corridor each weekday, are summarised in Table 2.3. Although no detailed assessment of the RailCorp Freight Working Timetable has been undertaken for weekends, it is assumed that equivalent numbers of spare daily freight train paths will also be available on weekends. Although these unused general freight train paths cannot be ordinarily used by coal trains due to their different operating characteristics, they confirm there is spare freight capacity in the RailCorp network.

Table 2.3 Summary of existing weekday RailCorp freight train paths throughout the corridor

Northbound (down) direction				Southbound (up) direction			
Vales Point (pass)	**Broadmeadow (arr)**	**Days spare**	**Run time (min)**	**Broadmeadow (dep)**	**Vales Point (pass)**	**Days spare**	**Run time (min)**
00:28	01:12	F	44	00:06	00:45	None	39
00:46	01:33	None	47	00:16	00:58	MWT	42
02:30	03:16	M	46	01:08	01:53	MTT	45
03:01	03:51	5 Days	50	01:51	02:36	MWF	45
03:30	04:20	5 Days	50	05:23*	07:47*	TWT	144*
04:03	04:53	5 Days	50	06:33	07:12	TWTF	39
04:33	05:19	5 Days	46	06:50	07:30	None	40
04:51	05:36	None	45	08:51	09:30	MTu	39
05:07	05:52	M	45	08:55	09:41	5 Days	46

Table 2.3 Summary of existing weekday RailCorp freight train paths throughout the corridor *(Cont'd)*

Northbound (down) direction				Southbound (up) direction			
Vales Point (pass)	Broadmeadow (arr)	Days spare	Run time (min)	Broadmeadow (dep)	Vales Point (pass)	Days spare	Run time (min)
06:01	06:49	None	48	09:39	10:16	M	37
06:55	07:43	MTuF	48	09:50	10:35	M	45
11:20	12:10	M	50	10:58	11:43	None	45
12:23	13:11	M	48	15:58	16:43	5 Days	45
12:55	13:43	None	48	16:51	17:33	M	42
13:56	14:44	5 Days	48	17:08	17:50	None	42
14:25	15:12	MTWF	47	17:56	18:44	None	48
14:49	15:31	MWTF	42	20:28	21:07	MWTF	39
15:20	16:06	TTF	46	20:33	21:17	5 Days	44
16:24	17:14	M	50	21:15	21:54	W	39
20:13	21:00	5 Days	47	21:22	22:04	MT	42
20:56	21:43	None	47	21:38	22:19	M	41
21:23	22:10	5 Days	47	22:01	22:50	None	49
21:59	22:49	5 Days	50	22:19	23:04	None	45
23:00	23:48	TTF	48	23:16	00:03	5 Days	47

Notes: Source: RailCorp 2012, Red highlight indicates spare freight train paths which are available on all five weekdays currently. Green indicates freight train paths which are used by existing operators on all five weekdays currently. Southbound train waits at Sulphide Junction.*

M = Mondays Only

W = Wednesday Only

TH = Thursday Only

F = Friday Only

MTu = Mondays and Tuesdays

MTuF = Monday, Tuesday, Friday

MTWF = Monday, Tuesday, Wednesday Friday

MWTF = Monday, Wednesday, Thursday, Friday

MWF = Monday, Wednesday, Friday

MWT = Monday, Wednesday Thursday

TWT = Tuesday, Wednesday, Thursday

TTF = Tuesday, Thursday, Friday

The current spare RailCorp freight train paths which are identified in Table 2.3 as being continuously available on all weekdays, could potentially be adapted for future trains transporting coal to the Central Coast power stations. There are also numerous local Newcastle area export and domestic power station coal train paths, which are normally used by an average of three, but potentially up to 10 coal train movements per day in each direction on weekdays and weekends.

The current RailCorp Freight Working Timetable in Appendix C defines 12 northbound and 11 southbound local Newcastle area coal train paths each weekday, which operate between the Eraring, Newstan and Teralba loading loops and the northern extent of the RailCorp network at Woodville Junction. These coal train paths normally operate at the times shown in Table 2.4 and are currently allocated between the existing coal train operators as follows:

- 12 Down (northbound) coal train paths for normally loaded coal trains each weekday:
  - 5 Teralba (Pacific National);
  - 3 Teralba (spare RailCorp);
  - 2 Newstan (Pacific National); and
  - 2 Eraring (Pacific National).
- 11 Up (southbound) coal train paths for normally empty coal trains each weekday:
  - 5 Teralba (Pacific National);
  - 2 Teralba (spare RailCorp);
  - 2 Newstan (Pacific National); and
  - 2 Eraring (Pacific National).

Table 2.4 Summary of spare Newcastle area coal train paths on weekdays

Northbound (Down) Direction				Southbound (Up) Direction			
from	**Depart time**	**Broadmeadow (arr)**	**Run time (min)**	**Broadmeadow (dep)**	**Arrive time**	**at**	**Run time (min)**
Teralba*[1]	00:50	01:30	40	01:30	02:00	Teralba*[3]	30
Newstan	01:15	01:52	37	02:21	03:12	Eraring*[4]	51
Teralba	03:29	04:09	40	07:07	07:58	Eraring	51
Eraring*[2]	04:46	05:35	49	09:56	10:28	Teralba	32
Teralba	05:45	06:25	40	12:50	13:22	Teralba	32
Eraring	11:34	12:16	42	14:49	15:20	Teralba	31
Teralba	12:45	13:25	40	17:33	18:04	Teralba	31
Teralba	15:10	15:49	39	18:25	18:55	Newstan	30
Teralba	16:50	17:24	34	19:16	19:46	Teralba	30
Teralba	20:02	20:36	34	21:45	22:13	Newstan	32
Teralba	20:59	21:39	40	22:56	23:25	Teralba	29
Newstan	22:45	23:24	39				

Source: RailCorp 2012, Red highlight indicates the spare RailCorp coal train paths which are currently available on all five weekdays.

**[1]An alternative time for this train path is also defined running 30 minutes later.*

**[2]An alternative time for this train path is also defined running 38 minutes later.*

**[3]An alternative time for this train path is also defined running 104 minutes later.*

**[4]An alternative time for this train path is also defined running 36 minutes later.*

The major constraint to the provision of additional coal train paths on the RailCorp network south of Newcastle is the gradients through Cardiff and between Kotara and Broadmeadow, where the slow speed of coal trains relative to passenger trains, requires larger gaps in the passenger train timetable. Also, at Woodville Junction, the requirement for southbound coal trains to cross at-grade over the tracks which are used by the northbound passenger trains represents a significant additional constraint to the inclusion of additional southbound coal train paths on the RailCorp network.

Therefore, some extension of the existing “spare RailCorp” Teralba coal train paths, further to the south would potentially enable more of these coal train paths to be used for the future Central Coast power station coal trains operating to Eraring and Vales Point. In addition to the two daily Pacific National coal train paths in each direction which are currently defined for Eraring coal trains,

The Eraring coal train paths are currently designed for the operation of 42 wagon trains. With the introduction of longer trains, more time will be required to release the trains from the RailCorp Network, unload it and return it to the RailCorp Network.

A reallocation and extension of some existing local Newcastle area coal train paths south of Teralba could be implemented by RailCorp to provide the practical minimum operational requirement of three return Woodville Junction to Eraring coal train paths each day and one return Woodville Junction to Vales Point coal train path each day for the Project’s Central Coast power station coal trains.

This strategy would impact on the current flexibility of the export coal train operations of the existing coal mines south of Newcastle (primarily Newstan and Teralba) which currently operate an average of three but a maximum of ten export coal trains each day. These mines would potentially be limited to operating a maximum of seven or eight return coal train paths each day for their transport of export coal to the Port of Newcastle. This type of strategy of increased sharing of coal train paths between operators is now an established feature of the ARTC managed export coal transport operations on the main Hunter Valley lines, where the combined export and domestic coal transport demand is much greater than on the RailCorp network. This management practice will need to be extended to the RailCorp network lines south of Newcastle in the future, as the coal transport demands on that section of the rail network increase also.

3 Rail transport requirements

3.1 Train loading

3.1.1 Coal loading facility

Product coal will be loaded on trains from the product coal stockpile area via a coal loading bin. The proposed train loading rate is 4,500 tonnes per hour.

3.1.2 Balloon loop

The Cobbora rail spur line will includes a 6.5 km balloon loop designed to be capable of holding four trains up to 1,550 m long, clear of the coal loading bin at the centre of the loop. In practice, this will permit two trains to remain stationary at the outer ends of the balloon loop and a third train to move under the loading bin from the entry to the exit track of the loop.

3.1.3 Rail spur

It is proposed to connect the rail spur line to the ARTC network at Tallawang (chainage 359 km from Sydney via Wallerawang) with a triangular junction and turn outs with maximum speed of 50 km/hr. The rail spur line will be 28 km long including the 6.5 km balloon loop. This line will be owned and maintained as a private siding by CHC. The triangular junction will permit the spur line to also receive trains from the north, via Dunedoo if this is required in the future.

Rail vehicle detection equipment will be installed on the rail spur line and signalling and switch point indicator equipment will be controlled from the ARTC network control centre in Broadmeadow.

3.2 Train unloading considerations

The domestic coal train unloading facilities at the main power station customer locations at Drayton, Eraring and Vales Point may need to be modified where necessary to provide the necessary train unloading capacity for the coal trains which will be used for product coal from the Project.

The planning approvals for any required modifications to these unloaders will be the subject of a separate planning application by the facility owner or operator.

3.3 Train lengths and loading capacities

It is anticipated the trains used to haul coal from the Project will have 30 TAL. This will require the track from Ulan to Tallawang to be upgraded to 30 TAL specification.

As indicated earlier in Section 1.1 of this report, the expected volumes at full production will be in the order of 9.5 Mtpa of domestic coal and up to 2.5 Mtpa of domestic spot sales/export coal. Train loads are likely to be in the range 7,800 to 8,800 tonnes. Train lengths will be up to 1,550 m. There will be between 1,450 to 1,500 train movements in each direction annually from the Project.

A proportion of these trains (estimated to be 285 annually) will only operate between the Project and Antiene/Drayton Junction. Most of the coal haulage task will be for Eraring and Vales Point power stations. A summary of the average daily train load requirement for the Project is provided in Table 3.1.

Table 3.1 Average daily train loads for the Project

Destination	Annual tonnes	Train size (tonnes)	Trains per year[1]	Trains per day	Daily train path requirement
Macquarie Generation	2,500,000	8,800	285	0.95	1
Eraring	5,200,000	7,800	667	2.22	3
Vales Point	1,800,000	7,800	231	0.77	1
Export	1,500,000	8,800	171	0.57	1 (combined)
Domestic Spot Market	1,000,000	7,800	129	0.43	
All	12,000,000		1,483	4.94	6

Notes: 1.Based on 300 days operation per year.

3.4 Train timetabling capacity

3.4.1 ARTC network

A preliminary train timetable has been prepared by ARTC for transporting coal from the Project. This indicates that coal train paths can be provided at two hour intervals in each direction between Ulan and Tallawang. This will provide 12 daily coal train paths in each direction from 2015 onwards, which will be more than sufficient to meet the likely future coal transport demand from the Cobbora project.

This timetable will connect into the forecast future timetabling for the Muswellbrook to Ulan line, which by 2017 will provide 26 coal train paths daily in each direction between Bylong and Mangoola (ARTC, 2012), increasing further east to 66 coal train paths daily in each direction between Bengalla and Muswellbrook.

Further to the south, from Muswellbrook to Hexham, the limiting section for coal train paths is the line between Camberwell and Whittingham. This constraint will be removed after 2015, when the lines will provide over 110 coal train paths per day in each direction (ARTC, 2012) over the full length of the route between Antiene/Drayton Junction and the coal terminals at the port of Newcastle.

A detailed comparison of the future demand for coal transport, with the line capacity on each section of the, route is provided in Chapter 4 of this report.

3.4.2 RailCorp network

For the Project coal trains to the Central Coast power stations, there will be an additional future timetable requirement to closely match the coal train paths when travelling both southbound and northbound at the interface between the ARTC and RailCorp networks at Woodville Junction and Islington Junction.

This requirement can be most reliably achieved by reviewing the existing spare RailCorp coal and general freight train paths to define four specific Project coal train paths in each direction on the RailCorp network. These four train paths would each be used on approximately 75% of all weekdays and weekend days for the Project coal trains travelling to and from either Eraring or Vales Point power station loops.

For train unloading purposes, it will be necessary for these coal train paths to be spaced at intervals to match train unloading capacities at the individual unload points. An overall rail network operational timetable will then need to be built to determine if these coal trains will be required to wait at any passing loops during their 30 to 45 km long journeys on the RailCorp network between Woodville Junction and Eraring or Vales Point.

The existing freight train passing loops in the Newcastle area south of Hexham (at Broadmeadow, Sulphide Junction and Awaba) do not generally have sufficient length and/or axle load capacity currently to accommodate coal trains 1,550 m in length in combination with 30 TAL and may not be able to be upgraded due to environmental or operational issues.

Some of these passing loops may need to be upgraded in their length and/or TAL capacity if any of the Project coal trains need to wait on the RailCorp network in the Newcastle area for any reason, such as to accommodate potential timetable gaps between their respective northbound and southbound train paths on the ARTC and RailCorp networks.

4 Rail network impacts

4.1 Cumulative increase in rail traffic

The projected cumulative increase in coal trains from the Project and all other known coal projects which will be operating between 2017 and 2021 has been determined from the ARTC demand projections (Appendix B) and is summarised for the Ulan line, west of Mangoola, in Table 4.1.

Table 4.1 Projected cumulative increase in coal transport demand (Mtpa) on the Ulan line

Year	Contracted volumes including all coal produced at the Ulan, Wilpinjong, Moolarben and Cobbora coal mines (Mtpa)	Contracted plus prospective volumes including additional coal which may be produced by proposed mines at Mt Penny, Bylong and Ferndale
2012	27	27
2013	32	32
2014	35	35
2015	39	45
2016	46	54
2017	47.5	56.5
2018	47.5	58.5
2019	47.5	58.5
2020	47.5	58.5
2021	48.5	59.5

Source: (ARTC, 2012).

Based on these projected production volumes, the existing coal train path demand in 2012 and the projected future coal train path demand in 2017 and 2021 on each section of the rail lines are compared in Table 4.2, Table 4.3 and Table 4.4, incorporating the additional coal transport capacity from all the known ARTC infrastructure upgrades which are to be implemented by 2017.

Table 4.2 Existing line coal train movements per day in 2012

Line Section	Average tonnage per train (t)	Contracted volume (Mtpa)	Loaded coal trains per day for contracted volume	Daily coal train path capacity each way *	% daily coal train path capacity utilised *
Bylong to Mangoola	7,759	27	11	14*	79
Bengalla to Muswellbrook	7,921	41	16	21*	76
Werris Creek to Scone	5,485	15	8	11*	73
Muswellbrook to Antiene	7,286	56	24	47*	51
Newcastle Ports	7,275	156	67	103*	65

*Source: (ARTC, 2012) *Note, the daily coal train path capacity in 2012 is specified in the previous ARTC (2011) strategy document.*

Table 4.3 Predicted future line coal train movements per day in 2017

Line Section	Average tonnage per train (t)	Contracted volume (Mtpa)	Contracted plus prospective volume (Mtpa)	Loaded coal trains per day for contracted volume	Loaded coal trains per day for contracted plus prospective volume	Daily coal train path capacity each way	% daily coal train path capacity utilised for contracted plus prospective volume
Bylong to Mangoola	7,730	47.5	56.5	19.3	22.9	26	88
Bengalla to Muswellbrook	7,911	71	81	28.1	32.1	66	49
Werris Creek to Scone	5,825	33.5	48.5	18	26.1	32	82
Muswellbrook to Antiene	7,240	107	133	46.3	57.6	118	49
Newcastle Ports	7,187	237	273	103.3	119.1	160	74

Source: (ARTC, 2012).

Table 4.4 Predicted future line coal train movements per day in 2021

Line Section	Average tonnage per train (t)	Contracted volume (Mtpa)	Contracted plus prospective volume (Mtpa)	Loaded coal trains per day for contracted volume	Loaded coal trains per day for contracted plus prospective volume	Daily coal train path capacity each way	% daily coal train path capacity utilised for contracted plus prospective volume
Bylong to Mangoola	7,730	48.5	59.5	19.7	24.1	26	93
Bengalla to Muswellbrook	7,911	72	84	28.5	33.2	66	50
Werris Creek to Scone	5,825	33.5	53.5	18	28.8	32	90
Muswellbrook to Antiene	7,240	108	144	46.8	62.3	118	53
Newcastle Ports	7,189	239	293	104.2	127.8	160	80

Source: (ARTC, 2012).

4.2 Summary of proposed rail infrastructure upgrades

The detailed analysis of the network coal train path demand from all mines in the region shows that the planned timetable capacity for coal train paths in the years 2017 and 2021 will generally be sufficient to meet the cumulative growth in demand from the Project and other coal projects, on all sections of the ARTC rail transport route. On the ARTC sections of the route, the high short-term rate of growth in the demand for coal transport which is predicted to occur between 2012 and 2017 will generally level off after 2017, with only minimal further growth predicted in the annual coal transport volumes between 2017 and 2021.

4.2.1 ARTC network

The current Hunter Valley network upgrading strategy (ARTC, 2012) is due to be implemented by 2017 and identifies all the future Hunter Valley coal transport capacity improvements on the Muswellbrook to Ulan line and between Muswellbrook to Hexham, which will be implemented by ARTC to accommodate the cumulative increased coal transport demand.

On the ARTC network, the access agreement which was negotiated between the ARTC and the Australian Competition and Consumer Commission (ACCC) guarantees future access to the Hunter Valley Rail Freight Network for all future coal producers and consumers in the region (HVAU, 2011). The costs of the capital works program will generally be recovered through the rail user access charges which are payable to the ARTC from each coal transport operator in the region.

4.2.2 RailCorp network

On the RailCorp network south of Newcastle, at least four dedicated coal train paths per day in each direction will need to be defined by 2015, for use by the Project. These train paths can be provided by reviewing the existing spare and under-used RailCorp coal and general freight train paths. The dedicated Project coal train paths on the RailCorp network will need to be spaced at intervals each day which provide sufficient turnaround time for the unloading requirements at the Eraring and Vales Point loops.

RailCorp has advised that two new passing loops will be required on the network by 2015 for use by freight trains in the Awaba North area, as a result of future corridor growth in coal and other freight train demand, including the Northern Sydney Freight Corridor Stage 1 improvements, Newstan expansion, the Wyong Coal project and the Project coal trains.

The RailCorp lines south of Newcastle are currently serving only a limited export coal transport demand, estimated at 3.3 Mtpa from the Teralba and Newstan collieries. The additional export and domestic coal transport demand which is predicted to occur on the RailCorp network after 2015 is an additional 5.2 Mtpa from the Teralba and Newstan mines and 7.0 Mtpa of domestic coal transport from the Project.

This additional demand will result in increased use of the existing capacity for coal and other rail freight transport south of Newcastle. However, there is currently sufficient unused coal and other general freight train capacity on the RailCorp lines south of Newcastle, as shown in Table 2.3 and Table 2.4, for this additional coal transport demand to be accommodated with minimal capacity improvements.

5 Level crossings

5.1 Level crossing identification and classification

There are approximately 3,800 railway level crossings in NSW of which 1,460 are on a public road. Historically, the level of control at all level crossings in NSW has been upgraded over time to appropriately manage the level of risk for the combined level of road and rail traffic at the crossing, in addition to any other general terrain-related safety and visibility factors. Risk factors can be assessed uniformly for all railway level crossings using a standard railway level crossing assessment model such as the Australian Level Crossing Assessment Model, ALCAM (Australian Transport Council, 2010).

Railway level crossings in NSW are generally defined as having three main categories of control:

- active barrier control, which is normally half boom barriers on the approach lane of the roadway only, in addition to flashing lights and bells;
- active control with flashing lights and bells; and
- passive control with give way or stop signs.

The main government agency in NSW which is responsible for the investigation and safety of level crossings is the Independent Transport Safety and Reliability Regulator (ITSRR). Other organisations which have been involved and have also undertaken safety investigations are the Level Crossing Safety Council (LCSC 2009) and the NSW Parliament Staysafe Committee (NSW Parliament 2009).

5.1.1 NSW Parliament Staysafe Committee

In 2009, a major investigation of the current safety risk and priority for upgrading of all 1,460 level crossings on public roads in NSW was completed (NSW Parliament, 2009). The investigation undertook an ALCAM risk assessment of all level crossings on public roads and produced a priority ranking list of 300 level crossings where the need for upgrades was greatest. This list is provided in Appendix D.

None of the level crossings in the Newcastle or Ulan, Gulgong and Tallawang areas were included in the most urgent category for upgrading works to reduce the accident risk from either train/vehicle or train/pedestrian collisions. However, the following three level crossings in these areas were included in the top 300 upgrade priority listing.

1. Clyde Street (Islington) was ranked priority 29 for upgrading in NSW, which was the fifth highest priority listing for upgrading of the railway level crossings in the Newcastle area. Four other level crossings in the Newcastle area at Beaumont Street (Hamilton), Merewether Street (Civic), Stewart Avenue (Wickham) and Shamrock Street (Hexham), were ranked at a higher priority for upgrading.

2. St James Road (Adamstown) was ranked priority 51 for upgrading in NSW, being the seventh priority listing of railway level crossings for upgrades in the Newcastle area, ranked as a lower priority than the above listed crossings and also the Railway Street crossing at Wickham.

3. Station Street (Gulgong) was ranked priority 295 for upgrading in NSW and was the only railway level crossing in the Ulan, Gulgong to Tallawang area which was included in the top 300 priority listing.

5.1.2 ITSRR Investigation

A major investigation of the accident history of a large sample of railway level crossings in NSW, using data from the 20 year period from 1989 to 2009, was completed in August 2009 (ITSRR Safety Research Unit, 2009). The investigation considered the combined accident history at 1,371 level crossings where 258 collisions had occurred over a 20 year period. This represented an overall average accident frequency rate of one accident per level crossing every 100 years approximately (0.010 per year). The total study sample comprised:

- 122 active level crossings with barrier control;
- 191 active level crossings with flashing lights and bells control; and
- 1,058 passive level crossings with give way or stop sign control.

A more detailed analysis of the historic accident frequency rates at 68 busy level crossings, where future safety improvements were most likely to be required, revealed a typical level crossing accident frequency range of 0.04 to 0.08 per year (one accident per 12 to 25 years at each crossing) at these crossings where an additional safety treatment was most likely to be required (Table 5.1).

Table 5.1 Average accident frequency rates for ITSRR study sample of busier level crossings

Type of Crossing	Average accident frequency rate per year	Number of crossings in analysed sample
Active – barrier control	0.035	13
Active – flashing lights and bells	0.079	10
Passive - give way or stop signs	0.038	45
All types of crossing	**0.043**	**68**

Source: (ITSRR Safety Research Unit, 2009).

The ITSRR report noted that due to the past historical application of safety measures at the busier sites in the study, in response to the increasing accident risks over time at these crossings, the current average accident rates for the busier crossings with each of the three main types of level crossing control, were all generally of a similar order of magnitude in the range of 0.04 to 0.08 collisions per year.

It was notable that the highest historic average accident rate (0.079 per year) occurred at the busier crossings which have the lowest type of active crossing control, ie flashing lights and bells but no boom gate barriers.

The report also identified and summarised the typical range of expected accident reductions from the installation of standard range of counter measures which are most frequently applied, based on either the Australian ALCAM method or similar research methods from the USA, as shown in Table 5.2.

Table 5.2 Typical range of accident reductions from level crossing safety upgrades

Type of Level Crossing Upgrade	% range reduction in accidents
Upgrade from passive control to active control (flashing lights and bells)	43 to 80
Upgrade from passive control to active control (flashing lights and half boom gate barriers)	62 to 90
Upgrade from active control with flashing lights to active control with flashing lights and half boom gate barriers	44 to 89
Installation of median barriers at active control crossings with half boom gate barriers	12 to 66

Source: (ITSRR Safety Research Unit, 2009).

The overall ITSRR analysis produced three annual collision risk prediction charts for typical collision rates for varying levels of daily road and train traffic for each crossing type, which are shown in Figure 5.1, Figure 5.2 and Figure 5.3. The data sample includes level crossing sites on both single track and multiple track rail lines, so the influence of the number of railway tracks at the level crossing is accounted for primarily in the daily train traffic volume, which is significantly lower on single track railway lines.

Figure 5.1 Risk of Collisions Per Year for Half Boom (Barrier Control) Level Crossings

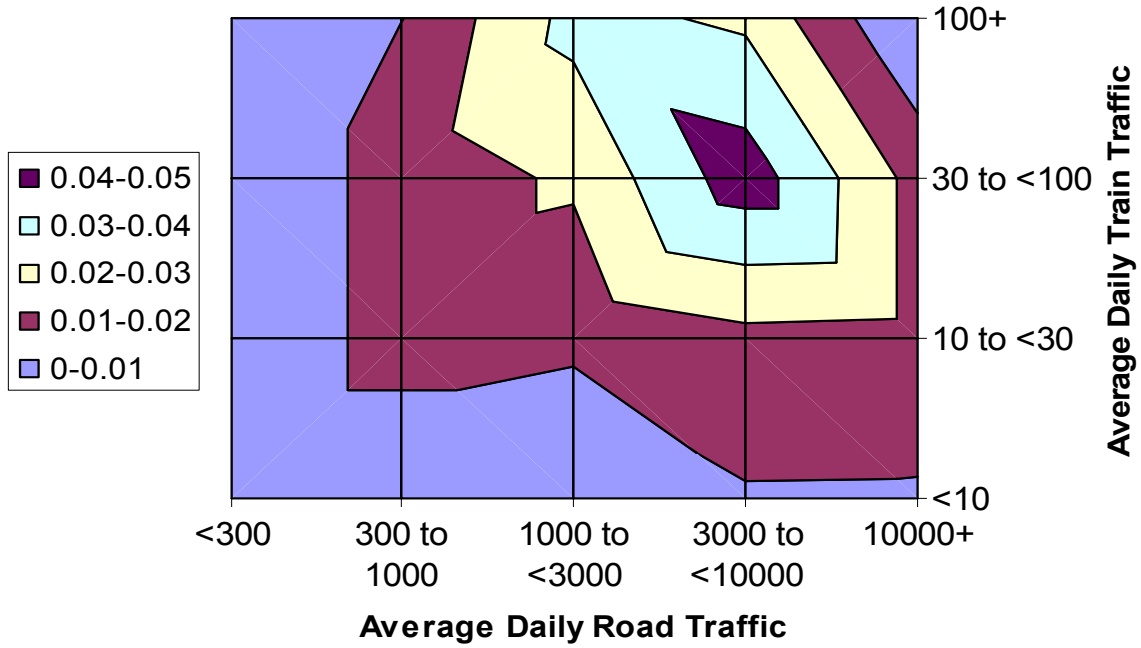


Figure 5.2 **Risk of Collisions Per Year for Flashing Light and Bell Controlled Crossings**

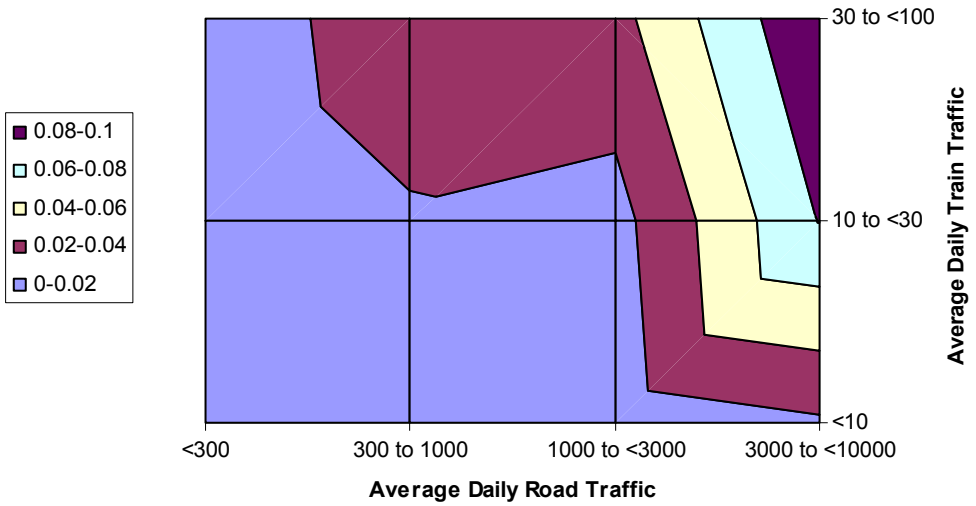
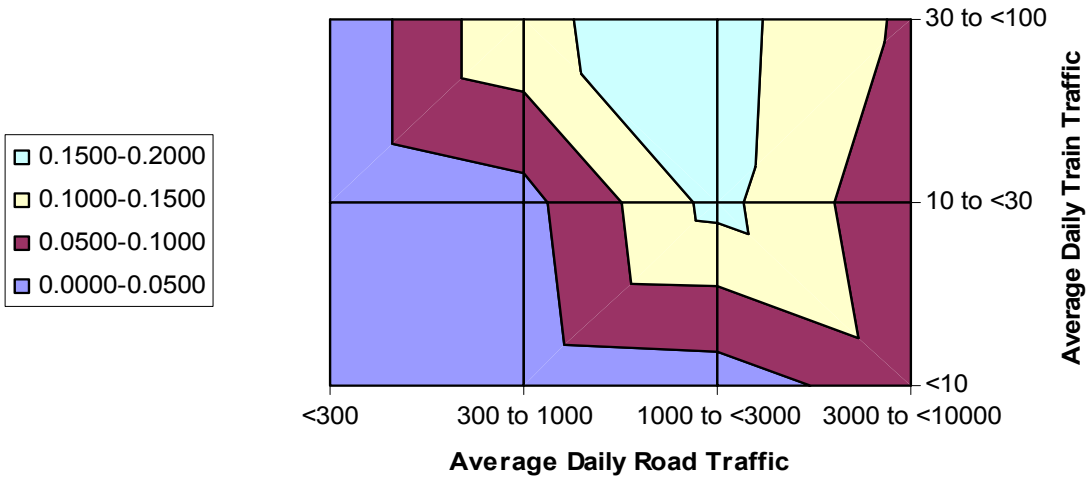


Figure 5.3 **Risk of Collisions Per Year for Passive Controlled Crossings**



For the active level crossings which are controlled by half boom gate barriers (Figure 5.1), the historical data shows that the accident rate (collisions per crossing year) initially rises with both road and train traffic levels, but then drops off at the higher combined road and rail traffic levels. There is, in effect, a highest risk type situation for these crossings when the road traffic volumes are in the range 3,000 to 10,000 vehicles per day and there are between 30 and 100 train movements per day. When the road and rail traffic volumes increase above these levels, the accident collision risk reduces.

For the active crossings which are controlled by lights and bells (Figure 5.2), there is a more typical pattern of consistently increasing risk, where the collision risk per year increases generally with increasing daily road and rail traffic and there is no "drop off" in the accident collision risk at higher traffic levels.

For the passive controlled crossings (Figure 5.3), there is a daily road traffic level, which is generally above 3,000 vehicles per day, where the collision risk drops off, but there is no corresponding daily train traffic level above which the collision risk declines. It was also found that the passive controlled crossings which have stop signs had an accident rate nearly double that of the crossings with give way signs. However, this situation is effectively the result of the passive crossings which have had a historically poor safety record being routinely protected with stop signs in preference to give way signs. In such cases, the crossing protection is dependent in practice on the road traffic complying with the stop sign instruction, which for habitual users of such crossings, is often poorly observed in locations where there is low train traffic.

The report (ITSRR Safety Research Unit, 2009) recommended that the level crossing accident risks of this nature at passive level crossings should be further investigated.

5.1.3 Level Crossing Safety Council

The Level Crossing Strategy Council (LCSC) is a NSW Government interagency forum which promotes co-ordination between government agencies regarding railway level crossing safety in NSW. It is made up of chief executive-level representation from the following agencies:

- NSW Transport and Infrastructure (NSWTI) chair;
- Roads and Traffic Authority (RTA) now RMS;
- Rail Infrastructure Corporation (RIC) now CRIA;
- RailCorp;
- Australian Rail Track Corporation (ARTC);
- Independent Transport Safety and Reliability Regulator (ITSRR);
- NSW Police Force; and
- Local Government and Shires Association (LGSA).

In its 2008/9 Annual Report (LCSC, 2009), the LCSC discussed recent trends in both accidents and fatalities for motor vehicle accidents and pedestrian accidents at level crossings in NSW. In 2008/9, the agencies which were represented by the LCSC had a combined budget of approximately $18 million for railway level crossing safety improvements. The closure of minor public and private level crossings was also targeted by the LCSC as an important safety improvement measure, where the existing use was either unsafe or minimal and suitable alternative crossing points existed. A total of 15 minor public and private level crossings (crossings which are used to access private residences) were closed on the Muswellbrook to Ulan line during 2008/9 at:

- Mangoola (2);
- Coggans Creek (2);
- Denman (3);
- Sandy Hollow (3);
- Wollar (2);
- Gulgong (2); and
- Kerrabee (1).

A further two level crossings on the Maitland to Muswellbrook line, at Antiene and Minimbah, were also closed under the LCSC program during 2008/9.

Safety improvement works at a combined total cost of $1.9 million were implemented during the year 2008/9 at level crossings on the Muswellbrook to Ulan line, as summarised in Table 5.3. These works included significant safety improvements for level crossings at Mangoola and between Mangoola and Muswellbrook, which have improved the safety of level crossings such that no further safety improvements are generally required in these areas.

Table 5.3 Summary of year 2008/9 Hunter Valley level crossing safety/improvement works

Type of Improvement	Location	Cost ($)
Installation of active control	Bengalla Junction to Mangoola	600,000
	Drayton to Muswellbrook	600,000
Level crossing upgrade	Sandy Hollow Junction to Wilpinjong	352,938
	Wilpinjong to Ulan	116,015
	Mangoola to Sandy Hollow Junction	53,786
	Ulan to Gulgong	17,817
Sighting distance improvement	Sandy Hollow Junction to Wilpinjong	68,598
	Bengalla Junction to Mangoola	67,962
	Mangoola to Sandy Hollow Junction	19,790

Source: LCSC (2009).

5.1.4 Department of Planning Assessment Guideline

The NSW government guideline, *Development Near Rail Corridors and Busy Roads* (Department of Planning, 2008) states that new level crossings are to be avoided wherever possible with any proposed development and alternative access arrangements should always be explored.

All existing railway level crossings have a risk profile which can be defined on the basis of the following seven risk assessment factors:

- visibility – how well motorists can see on-coming trains;
- the existing protection at the crossing;
- the frequency of trains passing through the area;
- the number of tracks;
- the volume and type of road traffic over the crossing;
- nearby road geometry; and
- the potential for motorists to queue on the crossing.

Wherever a proposed development will generate either additional traffic using an existing level crossing or change the composition of traffic using an existing level crossing, eg more heavy truck traffic, the predicted changes to the risk profile of the crossing must be taken into consideration by the consent authority when it is assessing the development application. This requirement is reinforced by the State Environmental Planning Policy (Infrastructure) 2007, clause 84 which states:

> Where a development involves a new level crossing, the conversion of a private access road across a level crossing into a public road or where the development is likely to significantly increase the total number of vehicles or number of trucks using a level crossing in the vicinity of the development, the Infrastructure SEPP requires that a consent authority must take into consideration:
>
> - the implications for traffic safety including the costs of ensuring an appropriate level of safety having regard to the existing traffic characteristics and any likely change in traffic affecting the crossing as a result of the development;
> - the feasibility of alternative means of access to the development that does not involve use of level crossings; and
> - any comments received from the CEO of the rail authority on the proposal.
>
> The consent authority must not grant consent for the development without the concurrence of the CEO of the rail authority. In determining whether to provide concurrence, the CEO if the rail authority must take into account:
>
> - any rail safety or operational issues associated with the aspects of the development; and

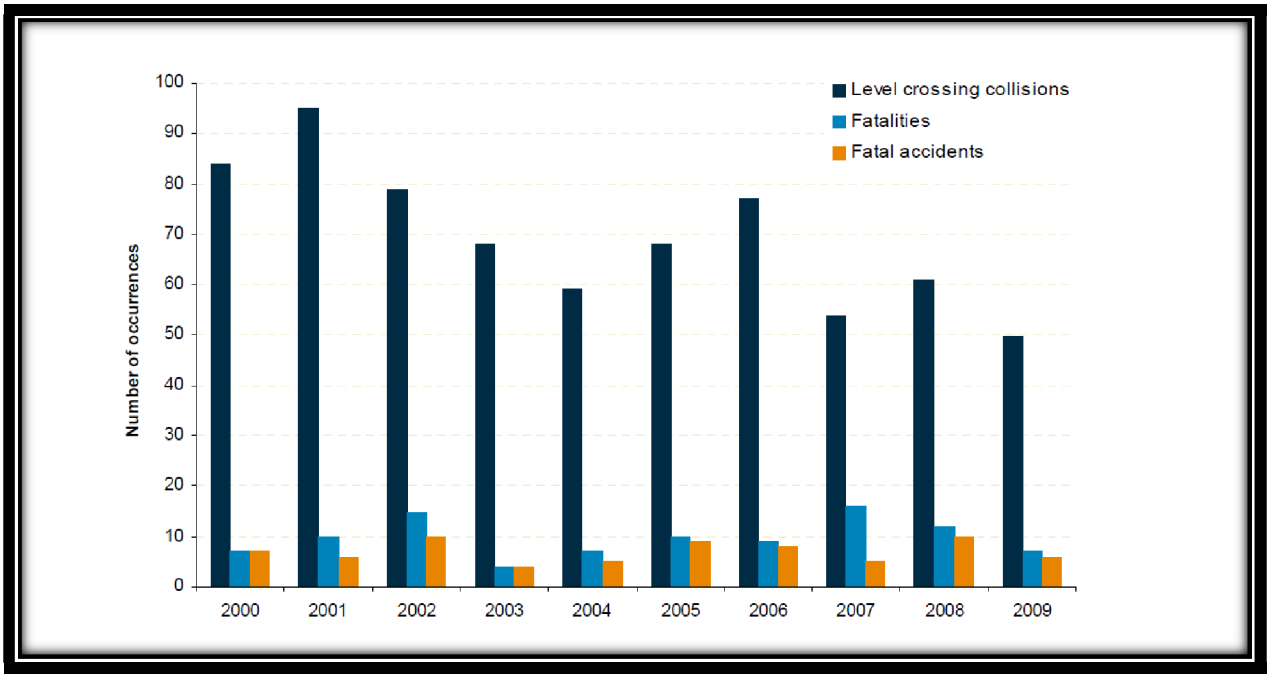
- the implications of the development for traffic safety including the cost of ensuring an appropriate level of safety, having regard to existing traffic and any likely change in traffic at level crossings as a result of the development.

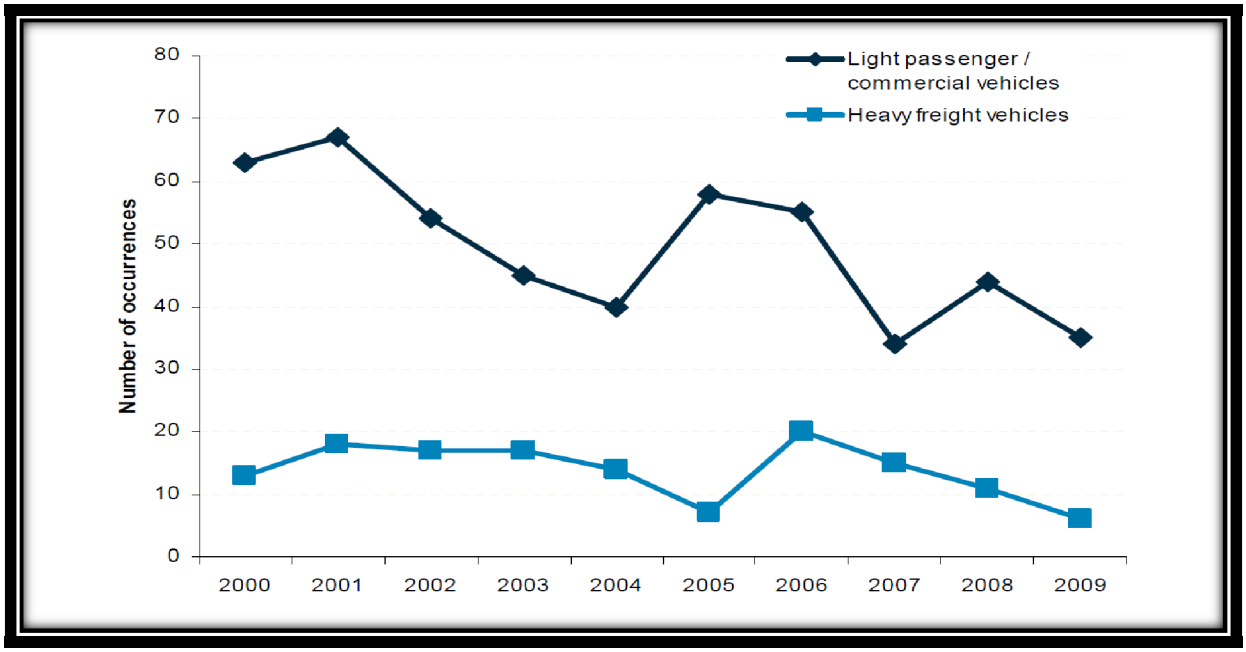
Note: traffic includes rail, road and pedestrian traffic.

5.2 Current safety levels at level crossings

A recent study (ITSR, 2011) shows trends in the overall safety risk at level crossings throughout Australia. The overall statistics from all the Australian states and territories show a generally decreasing number of collisions at level crossings each year over the past ten years (Figure 5.4). The number of fatal accidents and fatalities each year has nevertheless remained generally constant over the same period.

Figure 5.4 Recent Overall Trend in Level Crossing Collision Accidents in Australia





Source: ITSR (2011).

The report (ITSR, 2011) noted that heavy vehicles are now proportionally over represented in railway level crossing collisions in Australia, with no overall improvement over the past ten years in the annual number of collisions involving heavy vehicles. The report indicates that future efforts to improve level crossing safety should focus in particular on the role of heavy freight vehicles in level crossing collisions.

Heavy freight vehicles made up 20% of collisions with trains and 23% of fatal accidents in a collision with a train at level crossings, but such vehicles make up only 2.5% of registrations and around 6% of kilometres travelled in Australia. This suggests heavy freight vehicles are significantly over-represented in their number of collisions at level crossings. Collisions involving heavy freight vehicles also result in almost twice as many fatalities compared to collisions involving passenger and light commercial vehicles. These collisions are also more likely to fatally injured passengers or crew on a train. The report findings indicate that efforts to improve level crossing safety should give particular attention to collisions involving heavy freight vehicles.

5.3 Assessment of representative level crossings

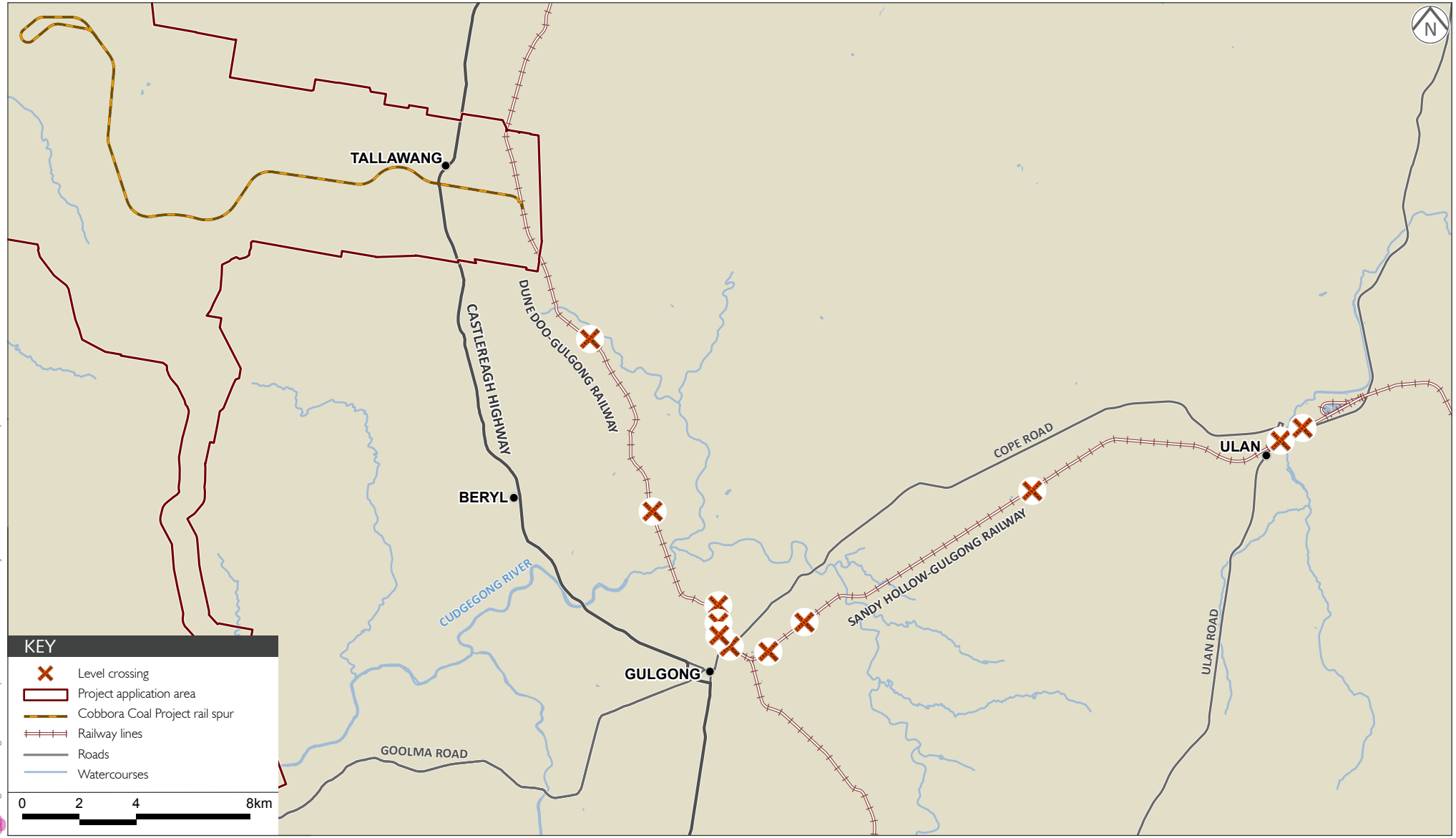
The existing and future collision safety risk and the road traffic delay (waiting time) performance of railway level crossings on the coal transport route has been assessed at:

- railway level crossings in the Newcastle urban area which are located on the coal transport route, eg at Clyde Street Islington (Photograph 5.1) and St James Road Adamstown (Photograph 5.2);
- existing level crossings on major traffic routes on the Muswellbrook to Ulan line between Mangoola and Ulan; and
- all level crossings on public roads in the Ulan, Gulgong and Tallawang areas, where the existing rail freight traffic is light and will increase significantly in proportional terms in the future, with additional coal trains from the Project. These level crossings are listed in Table 5.4, their locations shown in Figure 5.5, and are illustrated in Photographs 5.3 to 5.6.

At the other level crossings on railway lines further to the west at Birriwa on the Castlereagh Highway and at Dunedoo and Beni (east of Dubbo) on the Golden Highway, there will be no additional coal train traffic as a result of the Project. However, there will be more road traffic, including numerous extra truck traffic movements per day during the peak stages of Project construction.

Safety levels at these highway level crossings are considered to be generally good with no recent reported accidents. The level of control at each crossing (flashing lights) is appropriate as there is good traffic visibility on both the major road approaches. The level of rail traffic activity at these crossings is generally low (a maximum of one to two train movements daily) and will not increase as a result of the Project trains. Therefore, the future combined road/rail traffic safety collision risk at these level crossings should not change significantly due to the predicted road traffic increases only. Further detailed investigation of the safety of these highway level crossings is not required.

There are also some additional minor public road and private road crossings which currently provide access to farms and residential properties in the Ulan, Gulgong and Tallawang areas. The daily road traffic usage of these crossings is very low such that the existing collision safety risk of these crossings is not able to be readily quantified. However, some of these minor level crossings may be able to be closed in the future, subject to satisfactory alternative vehicular access being able to be provided for the affected rural properties.



Location of Ulan-Gulgong-Tallawang Area Level Crossings

Cobbora Coal Project - Rail Transport Assessment

Figure 5.5

Photograph 5.1 Level crossing at Clyde Street, Islington, following recent safety upgrade

Photograph 5.2 Level Crossing at St James Road, Adamstown, following recent safety upgrade

Photograph 5.3 Station Street (MR 598) level crossing at Gulgong

Photograph 5.4 Black Lead Road level crossing at Gulgong

Photograph 5.5 **Typical minor rural road level crossing near Tallawang**

Photograph 5.6 **View of the Gulgong to Dunedoo rail line looking south near Tallawang**

Table 5.4 Public road level crossings in the Ulan, Gulgong and Tallawang areas

Location	Type of Control	Daily road traffic volume	Additional collision risk factor at the crossing
Ulan mine entrance road	Active lights and bells	*	
Ulan village main street	Active lights and bells	690 (year 1992)	
Springwood Park Road	Passive- stop signs	*	Unsealed road
White Horse Road	Passive- stop signs	*	Unsealed road
Spring Creek Road (east of Gulgong)	Passive- stop signs	*	
Station Street (MR 598) at Gulgong	Active lights and bells	1,677 (year 2005)	
Talawang Street at Gulgong	Passive- stop signs	*	
Black Lead Road at Gulgong	Passive- stop signs	*	Proximity to the junction with Barneys Reef Road
Barneys Reef Road at Gulgong	Passive- stop signs	*	A curve on railway line to the south affects visibility
Jacksons Lane, west of Gulgong	Passive- stop signs	*	Unsealed road
Puggoon Road, northwest of Gulgong	Passive- stop signs	*	Unsealed road

*Notes: * Traffic Volume Data Not Available.*

On the Muswellbrook to Ulan rail line between Mangoola and Ulan, there are currently six operational level crossings which are located on major traffic routes. The locations of these crossings and their types of safety control are listed in Table 5.5.

Table 5.5 Level crossings on major traffic routes between Ulan and Mangoola

Location	Type of Control	Daily road traffic volume	Additional collision risk factor at the crossing
Golden Highway at Denman	Active lights and bells	2,000 to 3,000	Proximity to the Junction with Mangoola Road. A curve on the road to the south affects visibility
Rosemount Road at Denman	Active lights and bells	300 to 1,000	A curve on the road to the south affects visibility
Bylong Valley Way near Sandy Hollow	Active lights and bells	300 to 1,000	
Bylong Valley Way at Bylong	Active lights and bells	300 to 1,000	Proximity to the Junction with Wollar Road. The sealed road is in poor condition
Ulan-Wollar Road near Cumbo	Active lights and bells and boom gate barriers	Less than 300	Curves on the road to either side of the crossing affect visibility
Ulan-Wollar Road near Wilpinjong	Passive -stop signs	Less than 300	Curves on the road to either side of the crossing affect visibility. Unsealed road

5.4 Impacts on safety

The ITSRR data, summarised by the charts in Figure 5.1 to Figure 5.3, has been used to determine the estimated generic collision risk rates for all active and passively protected level crossings on the Newcastle, Mangoola to Ulan, and Ulan, Gulgong and Tallawang sections of the coal transport route. These risk rates have also been adjusted for other safety risk factors such as poor road geometry or road surface condition deficiencies and, where applicable, improved level crossing protection. The results of the assessment are given in Tables 5.6, 5.7 and 5.8.

Table 5.6 Assessment of collision risk at Newcastle level crossings

Level crossing location	Type of control	Existing daily road traffic	Existing daily train traffic	Existing risk of collision per year	Effect of additional trains
Clyde Street	Active lights, bells, barriers and median	7,200	142	0.015*	No change
St James Road	Active lights, bells, barriers and median	10,800	130	0.006*	No change

*Notes: * Generic collision risk is reduced by approximately 40% by the road median barrier.*

Table 5.7 Assessment of collision risk at Ulan, Gulgong and Tallawang level crossings

Level crossing location	Type of control	Existing daily road traffic	Existing daily train traffic	Existing risk of collision per year	Effect of additional trains
Ulan Mine Entrance Road	Active- lights and bells	300-1,000	2	0.010	0.020
Ulan Village Main Street	Active- lights and bells	690	2	0.010	0.020
Springwood Park Road	Passive- stop signs	Less than 300	2	0.040 **	0.080 **
White Horse Road	Passive- stop signs	Less than 300	2	0.040 **	0.080 **
Spring Creek Road	Passive- stop signs	Less than 300	2	0.020	0.040
Station Street MR 598	Active- lights and bells	1,000- 3,000	2	0.020	No change
Talawang Street	Passive- stop signs	Less than 300	2	0.020	0.040
Black Lead Road	Passive- stop signs	Less than 300	2	0.040 **	0.080 **
Barneys Reef Road	Passive- stop signs	Less than 300	2	0.040 **	0.080 **
Jacksons Lane	Passive- stop signs	Less than 300	2	0.040 **	0.080 **
Puggoon Road	Passive- stop signs	Less than 300	2	0.040 **	0.080 **

*Notes: ** Generic collision risk is increased significantly due to additional road or rail geometry or surface condition risk factors at the crossing location.*

Table 5.8 Assessment of collision risk at Mangoola to Ulan level crossings

Level crossing location	Type of control	Existing daily road traffic	Existing daily train traffic	Existing risk of collision per year	Effect of additional trains
Golden Highway at Denman	Active- lights and bells	2,000-3,000	24	0.040**	0.080**
Rosemount Road at Denman	Active- lights and bells	300-1,000	24	0.020	0.030
Bylong Valley Way near Sandy Hollow	Active- lights and bells	300-1,000	24	0.020	0.030
Bylong Valley Way at Bylong	Active- lights and bells	300-1,000	24	0.040**	0.060**
Ulan-Wollar Road near Cumbo	Active- lights and bells and boom gate barriers	Less than 300	24	0.005	No change
Ulan-Wollar Road near Wilpinjong	Passive- stop signs	Less than 300	24	0.050**	No change**

*Notes: ** Generic collision risk is increased significantly due to additional road or rail geometry or surface condition risk factors at the crossing location.*

The two existing actively controlled level crossings in the Newcastle urban area at Clyde Street and St James Road have recently been upgraded to the highest level of protection that is possible for a level crossing (lights, bells, barriers and a central road median barrier with pedestrian safety fence). At these two level crossings, which currently have approximately 130 to 140 passenger and freight train movements daily, the potential increase in the daily train traffic due to the Project (six additional train movements daily) will have no measurable effect on the collision risk level, which will remain low at approximately 0.01 collisions per year (Table 5.6).

In the Ulan, Gulgong and Tallawang areas, the potential additional daily coal train traffic due to the Project (ten additional loaded or empty coal train movements daily) will increase the total daily train traffic movements from a maximum of two per day currently to approximately 12 train movements per day, when the Project is at full production.

The level crossing in the Gulgong area with the highest road traffic volume currently is at Station Street, where the daily road traffic volume is in the range 1,000-3,000 vehicles per day. This crossing currently has active control with lights and bells but no half boom barriers. The estimated generic collision risk rate at this crossing is currently approximately 0.02 per year. The data in Figure 5.2 shows that at this daily traffic volume range, the increase in the daily train traffic (from two to 12 movements daily) will not change the generic collision risk rate for this type of crossing control, which will remain at approximately 0.02 per year (Table 5.7).

At the two level crossings at or near Ulan, which currently have active control with lights and bells but no half boom barriers, the daily road traffic volumes are in the range 300-1,000 vehicles per day and the estimated generic collision risk rate is approximately 0.01 per year. The data in Figure 5.2 shows that at this daily traffic volume range, the increase in daily train traffic (from two to 12 movements) will increase the estimated collision risk rate from approximately 0.01 per year to approximately 0.02 per year (Table 5.7). However, as this overall risk rate will remain acceptably low at these two level crossing locations (one collision every 50 years), additional active control measures such as half boom barriers should not be required.

At the eight level crossings on public roads within the Ulan, Gulgong and Tallawang areas which currently have passive (stop sign) control, the daily road traffic volumes are all generally 300 vehicles per day or less. The estimated generic collision risk rate at these crossings is approximately 0.02 to 0.04 per year, depending on whether there are any additional road or rail geometry related risk factors at the crossing.

The data in Figure 5.3 shows that the increase in daily train traffic due to the Project (from two to 12 train movements) will typically increase the estimated collision risk rate at these crossings to approximately 0.04 per year, or 0.08 per year where there are additional road or rail geometry defect or surface condition risk factors. Where a higher collision risk rate of 0.080 per year (one collision per crossing every 12 years) is predicted, an additional level crossing safety treatment is potentially warranted. However, this may involve either road geometry, road surface or level crossing safety control improvements.

At the six level crossings which are listed in Table 5.7, where the accident collision risk is estimated to increase to approximately 0.08 per year, a formal risk assessment study (eg using the ALCAM model) should be undertaken by ARTC during the detailed design stage for the track improvements. This further safety analysis will determine whether either additional level crossing safety control measures (eg lights and bells) or alternative road surface condition or road geometry improvements should be implemented at each location.

At all level crossings on major traffic routes on the Mangoola to Ulan line (Table 5.8), the additional Project train traffic will increase the current threshold of daily train movements to above 30 train movements per day. This will generally increase the estimated collision risk at most crossing locations. The level crossing location where the estimated future collision risk rate is greatest is on the Golden Highway near Denman, where the daily road traffic volume is greatest (approximately 2,000 to 3,000 vehicle movements daily). An additional level crossing safety improvement such as half boom barrier control at this location, would reduce the level crossing safety risk from approximately 0.08 per year to approximately 0.05 per year.

At two level crossings on the Mangoola to Ulan line, on the Ulan-Wollar Road near Cumbo and near Wilpinjong, (Table 5.8) the currently estimated level of collision risk varies significantly due to the differences in the current type of level crossing control (lights and bells with half boom gate barriers near Cumbo and passive control with stop signs near Wilpinjong). However, at the current range of daily road traffic (0 to 300 vehicle movements), the data in Figure 5.3 shows the effect of the additional Project coal trains will not change the current level of collision risk at these two crossings. Therefore, improvements at these two locations would not be warranted as a result of the Project.

5.5 Level crossing waiting times

5.5.1 Newcastle level crossings

A five day survey of level crossing closure times for road traffic was undertaken by RailCorp at the St James Road Adamstown level crossing in Newcastle, from 5 to 9 March 2012. The survey results for each day are summarised (Appendix E).

The overall average level crossing closure time per train (including the closures which had multiple train movements) was 3 minutes 20 seconds. The typical average closure times for each type of train, calculated from the level crossing closures which had only one train movement, were as follows:

- 2 minutes 40 seconds for scheduled CityRail or Countrylink passenger trains;
- 4 minutes 37 seconds for Interstate and general freight trains;
- 7 minutes 32 seconds for loaded coal trains;
- 5 minutes 40 seconds for empty coal trains; and
- 3 minutes for single locomotives, empty passenger trains or track maintenance vehicles.

The loaded coal trains normally result in the longest level crossing closure times as these trains are subject to a maximum 60 km/hr speed limit on the RailCorp network. When double or triple train movements occur, which usually occurs about 15 times per day at the Adamstown level crossing on a normal weekday, the actual level crossing closure time for that event increases, but the total level crossing closure time per train each day, reduces due to the overlap period between the closure times for each individual train.

During the five day survey period at the Adamstown level crossing in March 2012, there were three recorded instances of a single loaded coal train resulting in a level crossing closure time of over 10 minutes (over 11 minutes in the worst case) and six recorded instances of multiple train movements resulting in a level crossing closure time of over 10 minutes (over 14 minutes in the worst case).

The average number of daily train movements including all existing passenger and freight train movements at the two Newcastle area level crossings, during the March 2012 level crossing survey period, is summarised in Table 5.6.

Table 5.9 Summary of average weekday train movements at Newcastle area level crossings

Type of Train	Total daily train movements on the Sydney to Newcastle Line at St James Road Adamstown (March 2012 Survey)	Corresponding total daily train movements on the Newcastle to Maitland Line at Clyde Street Islington
CityRail passenger	83	95
Countrylink passenger	8	8
Coal	15	15
Interstate and general freight	20	20
Other	4	4
Total	**130**	**142**

Source: RailCorp Level Crossing Survey at Adamstown and CityRail Passenger Timetable.

The survey results in Table 5.6, for all train movements in both directions indicate there is a total level crossing closure time of approximately 432 minutes per day (30% of each day) at the St James Road level crossing and approximately 463 minutes per day (32% of each day), at the Clyde Street level crossing where there is a greater number of passenger train movements. These total closure times indicate that each car or other road vehicle travelling on the road network currently has a one in three chance typically of having to wait at these crossings while a train passes.

However, the closest alternative traffic routes to these two crossings, which are shown in the map in Figure 5.6, will typically result in an additional detour distance of at least 2 km from the direct traffic route, so most traffic will presumably continue to use the direct traffic route and accept the one in three chance of being delayed, for three minutes typically, at these level crossings.

With the addition of trains delivering coal to the Central Coast power stations, which will generate three additional return coal train movements each day across both of these level crossings, the total additional waiting time for the road traffic at each crossing will be approximately 39 to 40 minutes per day. This will increase the total length of time affected each day to 472 minutes (33% of each day) and 503 minutes (35% of each day) at the St James Road and Clyde Street level crossings respectively.

However, in proportional terms, the typical probability of any given vehicle being delayed by a train when crossing the railway line at either of these two level crossings will remain at a one in three chance approximately.

It is also unlikely that the Project's coal trains will be travelling through the Newcastle urban area during the busiest times of the morning peak (7.00 am to 9.00 am) or afternoon peak (4.00 pm to 6.00 pm) traffic periods, so it will primarily be off-peak and night time traffic on the road network which will be affected by the additional coal trains.

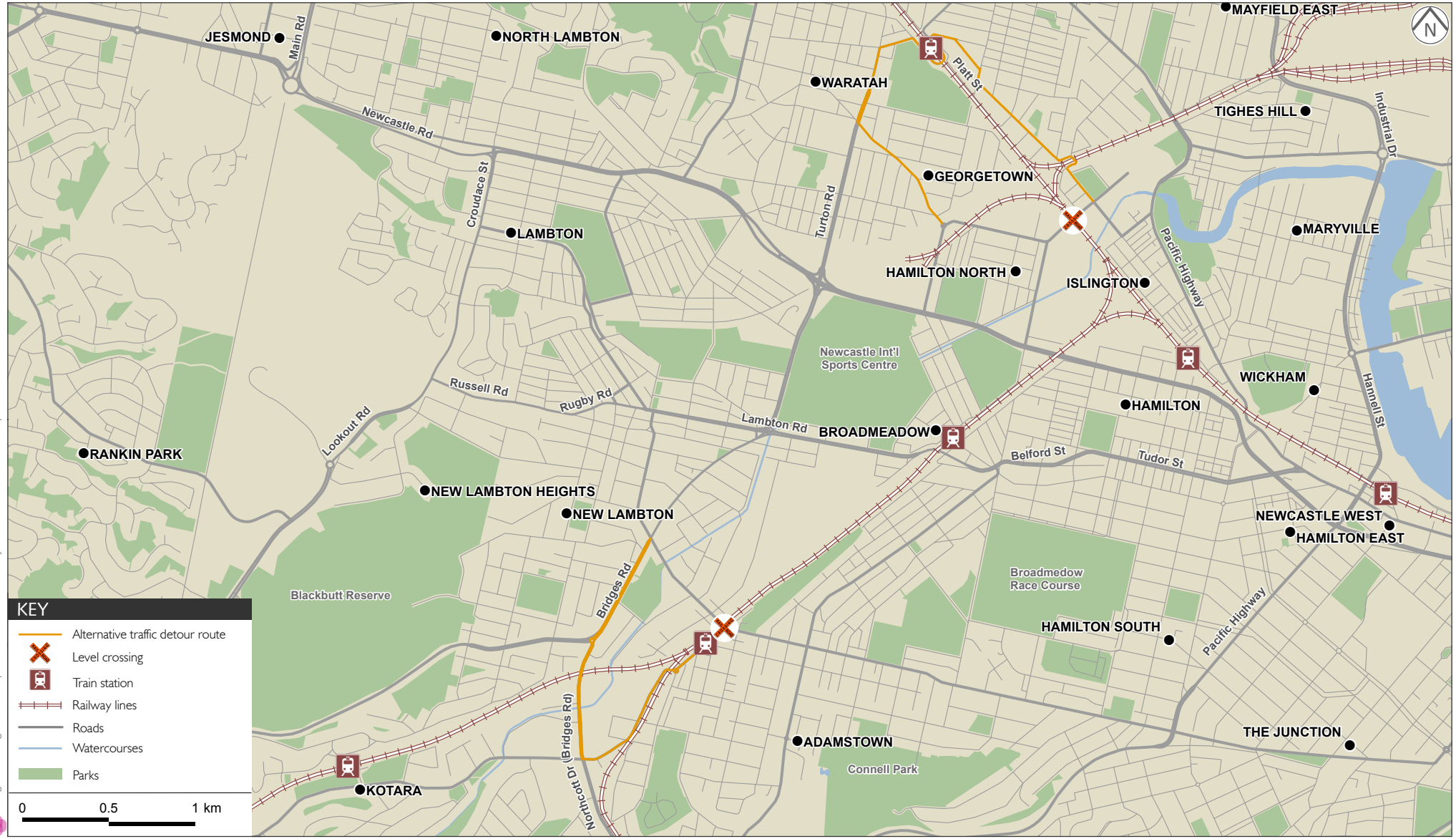
5.5.2 Mangoola to Ulan line crossings

On the Muswellbrook to Ulan line, west of Mangoola, the typical level crossing waiting times due to eleven coal trains and one freight train per day in each direction (24 train movements per day) are a total of 154 minutes per day typically at each level crossing. This represents 10.7% of each day affected, with a corresponding 1 in 9.3 chance of any road vehicle being delayed by a passing train at each level crossing.

For a typical resident of the area between Denman, Sandy Hollow, Bylong, Wollar and Ulan who may travel across one of the affected level crossings twice each day, the current likelihood of waiting on their journey while a train passes at a level crossing, would be approximately once every four to five days, that is one and a half times per week typically.

The transport of coal from the Project at full production will typically generate five additional return coal train movements each day across each of the six level crossings which are located on major traffic routes between Mangoola and Ulan. The additional duration of level crossing closures from ten additional train movements will be 65 minutes per day, increasing the total time of closures to 219 minutes at each crossing.

The typical probability of any specific vehicle being delayed by a train when crossing the railway line at either of these level crossings will increase from approximately a 1 in 9.3 chance currently to a 1 in 6.6 chance. For a resident of the area who may typically travel across a level crossing twice per day, the future likelihood of waiting at a level crossing on their journey while a train passes, once the Project is at full production capacity, will increase to approximately once every 3.3 days, that is twice per week typically.



Integrated Design Solutions | 030518 Cobbora Coal Project - RTA - F5.6 Rev E - 05 September 2012

Urban Road Network Showing Alternative Traffic Routes at Adamstown and Islington

Cobbora Coal Project - Rail Transport Assessment

Figure 5.6

5.5.3 Gulgong area level crossings

In the Gulgong area, the typical railway level crossing waiting times due to one freight train per day in each direction (two train movements per day in total) are a total of nine minutes per day at each level crossing. This represents 0.6% of each day affected. There is a correspondingly minimal 1 in 160 chance typically of any specific road vehicle being delayed by a train passing at a level crossing in this area currently.

For a typical resident of the Gulgong area who may need to travel across a level crossing twice per day, the current likelihood of waiting on their journey while a train passes at a level crossing, would be very low at approximately once every 80 days which is four times per year typically.

The transport of coal from the Project, at full production, will generate an additional five return coal train movements each day across the Gulgong area level crossings. The total additional closure time will be 65 minutes per day, increasing the total time affected to 74 minutes per day (5% of each day) at each of the Gulgong area crossings.

The probability of any specific vehicle being delayed by a train at any of these level crossings will therefore increase from a 1 in 160 chance currently to a 1 in 20 chance, once the Project is at full production. However, for a resident of the Gulgong area who may typically travel across a level crossing twice per day, the future likelihood of waiting at a level crossing on their journey while a train passes will remain relatively low at approximately once every 10 days, that is typically three times per month when the Project is at full production.

6 Other environmental impacts

6.1 Noise and dust impact assessments

Detailed noise and air quality impact assessments have been undertaken of the potential impacts from noise and dust generated by coal trains travelling to and from the Project (EMM, 2012b) and (Environ, 2012).

These two studies have primarily investigated the sections of the coal transport route where there is no coal haulage currently (eg the Project rail spur line and the Tallawang to Ulan section of the route).

6.1.1 Noise impact assessment

The findings of the project noise and vibration impact assessment (EMM, 2012b) which relate to the proposed rail transport operation have concluded the following impacts and mitigation measures are required for the project.

Offsite train movements on the main line for planned train movements are predicted to satisfy the relevant daytime noise criteria at all receptors. The night L_{eq} criteria would be satisfied at all but six receptors that are situated within 30 m of the railway during the planned train movement scenario. The L_{max} criteria would be satisfied at all but two receptors that are situated within 25 m of the railway. Noise mitigation options have been provided in this report such as barriers, acoustic treatment of dwellings and provision of ventilation to dwellings.

The following mitigation and management commitments for the project rail transport will be provided by CHC, based on the outcomes of the noise and vibration impact assessment:

- CHC has, or will, buy properties or reach amenity agreements with all willing landowners along the spur line from Tallawang to Laheys Creek if EPA noise criteria will be exceeded;
- CHC will mitigate noise along the rail spur with acoustic barriers to achieve EPA criteria at two privately-owned homes where the owners do not want to sell or enter into amenity agreements;
- CHC will conduct regular compliance noise monitoring which will provide input to adaptive noise management strategies for the Project;
- CHC will work with ARTC and affected residents to assess and mitigate any significant impacts along the Tallawang to Ulan section of the railway line; and
- rail noise impacts will continue to be managed along the entire rail transport route according to ARTC and RailCorp environmental protection licences.

6.1.2 Dust impact assessment

The rail line between Tallawang and Ulan is not currently used for coal transport. Airborne particulates dispersion along a 5 km section of this rail line, including through the town of Gulgong, was modelled using the USEPA transportation dispersion model, 'CAL3QHCR'.

The peak 24-hour average TSP concentration of coal particulates emitted from uncovered rail wagons is predicted to be approximately 2 µg/m^3 within 10 m of the rail line, falling to less than 1 µg/m^3 50 m from the line. If it is assumed that PM_{10} concentration is typically 50% of the TSP concentration (based on the USEPA predictive emission factor for wind entrained particulates from stockpiles), the incremental PM_{10} concentration will be approximately 1 µg/m^3 within 10 m of the rail line. The results indicate that coal dust levels at the edge of the rail corridor will be below levels that are known to impact on amenity.

While empty wagons returning to the Project will contain coal dust, the majority of this dust will be on internal surfaces of the wagons. This coal dust will be less exposed to the wind and therefore emissions will be lower. However, the assessment has assumed empty wagons will produce the same level of emissions as loaded wagons and is therefore conservative.

The assessment has shown that airborne particulates impacts are unlikely from wagons travelling to and from the Project.

6.2 RailCorp and ARTC environment protection licences

The environmental impacts related to noise and air/dust pollution along the remainder of the coal transport route towards Newcastle and Vales Point, on the ARTC and RailCorp networks, are currently influenced by a wide range of train operating factors and environmental conditions. The noise and air quality environments adjacent to the rail corridor are affected by environmental factors such as the prevailing wind speed and direction and are the result of a complex interaction from a wide range of potential noise and air pollution sources, namely:

- general train noise;
- locomotive noise;
- low frequency noise;
- wheel squeal;
- train horns;
- use of safety detonators during rail maintenance;
- locomotive diesel exhaust emissions; and
- dust emissions from train loads.

Environmental compliance conditions are detailed in the environment protection licences (EPLs) of both ARTC and RailCorp (EPA Licence no. 12209). These describe the current noise and air quality management measures and operating controls of the rail network operators, in addition to a number of research studies and related investigations, which are currently being conducted to identify better ways of managing the impacts of train noise and air quality from coal transport operations.

7 Conclusions and recommendations

7.1 Proposed rail operations

The Project is being developed to supply 9.5 million tonnes per annum (Mtpa) of coal to five power stations to meet contracts signed as part of the GenTrader transactions. It will also transport up to 2.5 Mtpa of coal generally to the Port of Newcastle for export or sale to other domestic customers in NSW.

The majority of the Project related coal trains will be 7,800 to 8,800 tonnes loaded capacity and will be between 1,370 m to 1,550 m long. Approximately 20% of these trains will deliver coal to the power stations in the Hunter Valley (Bayswater and Liddell) while the remainder will travel on to the power stations on the Central Coast or the Newcastle export coal loaders at Port Waratah and Koorangang Island.

The expected total product coal volume is 12 Mtpa at full production. This will require annual train movements in the range of 1,450 to 1,550 in each direction from the Cobbora mine, travelling via Gulgong and Ulan over the ARTC Hunter Valley lines. An average of five loaded trains daily will be required, seven days per week, to service this demand.

Whilst a proportion of these trains (estimated to be 285 annually) will operate between the Project and the Hunter Valley power station unloading loop at Drayton, it is expected most of the haulage task will have to be undertaken on a disciplined basis for the domestic market supply task for the Eraring and Vales Point power stations. Trains carrying additional coal for spot domestic sales or for export will be subject to more flexibility in accordance with normal ARTC Hunter Valley train path allocation requirements to meet port and shipping schedules.

The relevant internal investigations are currently being undertaken by RailCorp to assess the future train path timetable modifications, passing loop utilisation and running time requirements for the operation of the Project coal trains to the Eraring and Vales Point rail unloading loops. This will require a minimum of four dedicated coal train paths per day each way on the RailCorp network south of Newcastle, which will need to be available seven days per week for the domestic coal supply transport between Cobbora and the Central Coast power station rail unloading loops.

Although at least four spare export coal or general freight train paths each way per day are currently available on the RailCorp network for this purpose, their times of day and sectional running times will potentially need to be modified to be suitable for the required travel speeds, train unloading and train turnaround times for longer coal trains (7,800 tonnes capacity typically) to operate to and from the two nominated Central Coast power station unloading points at Eraring and Vales Point.

7.2 Rail transport impacts

A detailed analysis of the current ARTC and RailCorp network coal train path demand in 2012 and the projected future increase in the combined coal train demand from all mines in the Hunter Valley region by 2017 and 2021, has been undertaken for all sections of the coal transport route between Tallawang and Vales Point, incorporating all the known ARTC and RailCorp network infrastructure upgrades which are scheduled to be implemented by these years.

This analysis shows that the proposed additional timetable capacity for coal train paths on the ARTC network by 2017 and 2021 will be sufficient to meet the cumulative additional demand from the Project and all other identified coal projects, on all sections of the coal transport route, by these years.

On the RailCorp lines south of Newcastle, RailCorp has advised that two additional passing loops at North Awaba will need to be implemented by 2015 to meet the predicted longer term growth in the demand for passenger, general freight, export and domestic coal transport in the region south of Newcastle by the year 2015.

On the ARTC network, the access agreement negotiated by the ACCC will guarantee future access to the Hunter Valley Rail Freight Network for all future coal producers and consumers in the Region (HVAU, 2011).

7.3 Impacts on railway level crossing safety

Under a recent the NSW Government guideline, *Development Near Rail Corridors and Busy Roads* (Department of Planning, 2008), new level crossings are to be avoided wherever possible with any proposed development and alternative access arrangements should always be explored.

Wherever a proposed development will generate either additional traffic using an existing level crossing or change in the composition of traffic (eg more heavy truck traffic) using an existing level crossing, the predicted changes to the risk profile of the crossing must be taken into consideration by the consent authority, when it is assessing the development application.

The two existing actively controlled level crossings in the Newcastle urban area at Clyde Street, Islington and St James Road, Adamstown, have recently been upgraded to the highest level of safety protection which is possible for a level crossing (flashing lights, bells, barriers and a central road median barrier with pedestrian safety fence). At these two level crossings, the potential increase in the daily train traffic due to the Project (six additional loaded or empty coal train movements daily at full production) will have no measurable effect on the existing collision risk level, which will remain at a low level of approximately 0.01 collisions per year typically.

The future level crossing safety has been assessed at six crossings on major traffic routes on the Mangoola to Ulan line. The crossing with the highest estimated future collision risk is that with the highest daily road traffic volume, the Golden Highway near Denman, where there are approximately 2,000 to 3,000 vehicle movements daily. At this location, additional half boom barrier control is recommended which will reduce the estimated future collision risk rate from approximately 0.08 per year to approximately 0.05 per year.

At the other five crossings which have been assessed on the Mangoola to Ulan line, the additional Project coal trains will not significantly change the current safety levels at any crossings. Therefore, no safety improvements at these five level crossings will be warranted as a direct result of the Project.

In the Ulan, Gulgong and Tallawang areas, the potential additional daily coal train traffic due to the Project (ten additional loaded or empty coal train movements daily at full production) will increase the total daily train traffic from a maximum of two movements per day currently to approximately 12 train movements per day in the future. This will have some impact on the existing levels of railway level crossing safety in these areas, as summarised below.

In the Gulgong area, the level crossing with the highest daily road traffic volume currently is at Station Street where the daily road traffic volume is in the range 1,000 to 3,000 vehicles per day. However, at this daily road traffic volume range, the increase in the daily train traffic from two to 12 movements daily will not change the estimated collision risk rate for this type of crossing control (active control with flashing lights but no half boom barriers), which will remain at 0.02 per year approximately.

At the two Ulan-area level crossings, which also have active control with flashing lights and bells but no half boom barriers, the daily traffic volumes are currently in the range 300 to 1,000 vehicles per day. The increase in the daily train traffic from two to 12 movements daily will change the estimated collision risk rate for this type of crossing control from approximately 0.01 per year to approximately 0.02 per year. However, as the estimated collision risk rate at these crossings will remain relatively low (eg one collision every 50 years) additional active control measures such as half boom barriers will not be required at these two crossings.

At eight other level crossings on public roads within the Ulan, Gulgong and Tallawang areas, which currently have passive (stop sign) control and daily road traffic volumes of 300 vehicles per day or less, the increase in the daily train traffic due to the Project will increase the estimated collision risk rate at each level crossing from the range 0.02 to 0.04 per year typically to the range 0.04 to 0.08 per year typically, depending on the extent of any existing road or rail geometry, visibility or surface condition defects which are present at each location.

At the six crossing locations where significant existing road or rail geometry, visibility or surface condition defects are present, the higher future estimated collision risk rate of 0.08 per year will require the current passive (stop sign) control to be improved with either additional road improvements or additional level crossing safety treatments at each location. These locations are:

- Springwood Park Road (Cope);
- White Horse Road;
- Black Lead Road;
- Barneys Reef Road;
- Jacksons Lane; and
- Puggoon Road.

It is recommended that a more detailed formal risk assessment study of these level crossings is undertaken by ARTC as part of the detailed design and environmental approvals for the Ulan, Gulgong and Tallawang track upgrading works. This will confirm whether either the implementation of additional active safety control measures (eg flashing lights and bells) is appropriate at each affected crossing, or other road surface condition, visibility or road geometry improvements should be implemented.

At some additional minor level crossings which currently provide access to farms and residential properties in the Ulan, Gulgong and Tallawang areas, the daily road traffic usage of these crossings is very low and the existing safety collision risk of these crossings has not been able to be formally assessed. Some of these minor level crossings may potentially be able to be closed in the future, subject to satisfactory alternative vehicular access being able to be provided for the affected rural properties. The provision of suitable alternative access will need to be negotiated with each affected property owner.

7.4 Impact on railway level crossing waiting times

The road traffic delays and waiting times at railway level crossings have been assessed at two railway level crossings in the Newcastle urban area, at Clyde Street, Islington and St James Road Adamstown, and at all the railway level crossings on public roads in the Ulan, Gulgong and Tallawang areas.

The results from a five day survey of all existing train movements during a typical week in March 2012, indicated the total current level crossing closure time is 432 minutes per day (30% of each day) at the Adamstown railway level crossing and 463 minutes per day (32% of each day) at the Clyde Street railway level crossing. These total delays indicate that each car or other road vehicle travelling on the road network currently has roughly a one in three chance of waiting at these crossings while a train passes. However, as the shortest alternative traffic routes that avoid these two crossings will typically result in additional road traffic detour distances of at least two kilometres away from the direct route, most traffic will continue to use the direct traffic route and accept the one in three chance of being delayed at the level crossing.

The additional trains delivering coal from the Project will typically generate six additional loaded or empty coal train movements each day across both of these level crossings. The additional waiting time for road traffic will be approximately 40 minutes per day which will increase the total length of time affected each day to 472 minutes per day (33% of each day) and 503 minutes per day (35% of each day) at the Adamstown and Clyde Street railway level crossings respectively.

In proportional terms, the future probability of any given vehicle being delayed by a train when crossing the railway line at either of these two level crossings will remain at a one in three chance typically. However, due to the current morning and afternoon peak period freight train curfews on the Sydney metropolitan rail network, it is unlikely that the additional coal trains from the Project to the Central Coast power stations will be travelling through the Newcastle urban area during the busiest morning peak (7.00 am to 9.00 am) or afternoon peak (4.00 pm to 6.00 pm) commuter traffic periods, so it will primarily be off-peak traffic on the road network which will be affected by additional Project coal trains.

On the Muswellbrook to Ulan line, west of Mangoola, the typical railway level crossing waiting times due to eleven coal trains and one freight train per day in each direction (24 train movements per day) are a total of 154 minutes per day at each level crossing. This represents 10.7% of each day, with a corresponding one in 9.3 chance of any road vehicle being delayed by a train passing at each crossing.

The transport of coal from the Project at full production will typically generate five additional return coal train movements each day across each of the six level crossings which are located on major traffic routes between Mangoola and Ulan. The estimated additional duration of the level crossing closures from the ten additional train movements will be 65 minutes each day. This will increase the total time affected to approximately 219 minutes each day (15.2% of the time) at each crossing.

Once the Project is at full production capacity, the typical probability of any specific vehicle being delayed by a train when crossing the railway line at one of these level crossings on the Ulan line will increase from a one in 9.3 chance currently to a one in 6.6 chance. For a resident of the area who may typically need to travel across one of these level crossings twice per day, the future likelihood of waiting at a level crossing on their journey while a train passes, will increase from approximately once every four to five days, that is one and a half times per week typically, to approximately once every 3.3 days, ie twice per week typically.

In the Gulgong area, the current railway level crossing waiting times due to freight train movements with one train per day in each direction (two train movements daily) are around nine minutes per day in total at each level crossing. This represent 0.6% of each day affected, with a very low (1 in 160 chance) of any specific road vehicle being delayed by a train passing at each railway level crossing in the area. For a typical resident of the Gulgong area who may travel across a level crossing twice per day, the current likelihood of waiting on their journey while a train passes at a level crossing, would be approximately once every 80 days, ie four times per year typically.

The transport of coal from the Project, at full production, will typically generate ten additional loaded or empty coal train movements each day across the Gulgong area level crossings. The additional duration of the railway level crossing closures each day will be 65 minutes approximately. This will increase the total length of time affected to 74 minutes per day (5% of each day) at each of the affected Gulgong area railway level crossings.

After the Project has reached full production, the typical probability of any specific vehicle being delayed by a train when crossing the railway line at one of the Gulgong area level crossings, will increase from approximately a one in 160 chance currently to a one in 20 chance in the future. For a resident of the Gulgong area who may typically travel across a level crossing twice per day, the future likelihood of having to wait on their journey at a level crossing while a train passes will remain relatively low at approximately once every 10 days This level of impact, while noticeable, should generally be acceptable to most road users in the area.

7.5 Other environmental impacts

Environmental compliance conditions are detailed in the environment protection licences (EPLs) of both ARTC and RailCorp. These describe the management measures and operating controls, in addition to a number of ongoing research studies and related investigations which are currently being implemented, to manage and reduce the existing impacts of train noise and air quality/dust related impacts from coal transport operations.

CHC will conduct regular noise monitoring which will provide input to adaptive noise management strategies for the Project. CHC will work with ARTC and affected residents to assess and mitigate any significant noise impacts along the Tallawang to Ulan section of the railway line.

Offsite train movements on the main line for planned train movements are predicted to satisfy the relevant daytime noise criteria at all receptors. The night L_{eq} criteria would be satisfied at all but six receptors that are situated within 30 m of the railway during the planned train movement scenario. The L_{max} criteria would be satisfied at all but two receptors that are situated within 25 m of the railway. Noise mitigation options have been provided in this report such as barriers, acoustic treatment of dwellings and provision of ventilation to dwellings.

The rail line between Tallawang and Ulan is not currently used for coal transport. Airborne particulates dispersion along a 5 km section of this rail line, including through the town of Gulgong, was modelled using the USEPA transportation dispersion model, 'CAL3QHCR'.

The peak 24-hour average TSP concentration of coal particulates emitted from uncovered rail wagons is predicted to be approximately 2 $\mu g/m^3$ within 10 m of the rail line, falling to less than 1 $\mu g/m^3$ 50 m from the line. If it is assumed that PM_{10} concentration is typically 50% of the TSP concentration (based on the USEPA predictive emission factor for wind entrained particulates from stockpiles), the incremental PM_{10} concentration will be approximately 1 $\mu g/m^3$ within 10 m of the rail line. The results indicate that coal dust levels at the edge of the rail corridor will be below levels that are known to impact on amenity.

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Appendix A

Maps of the Rail Network

Integrated Design Solutions | 030518 Cobbora Coal Project - RTA - FA.1 Rev E - 05 September 2012

EMM

Cobbora Holding Company Pty Limited

Proposed Rail Spur Line and Tallawang to Ulan Line

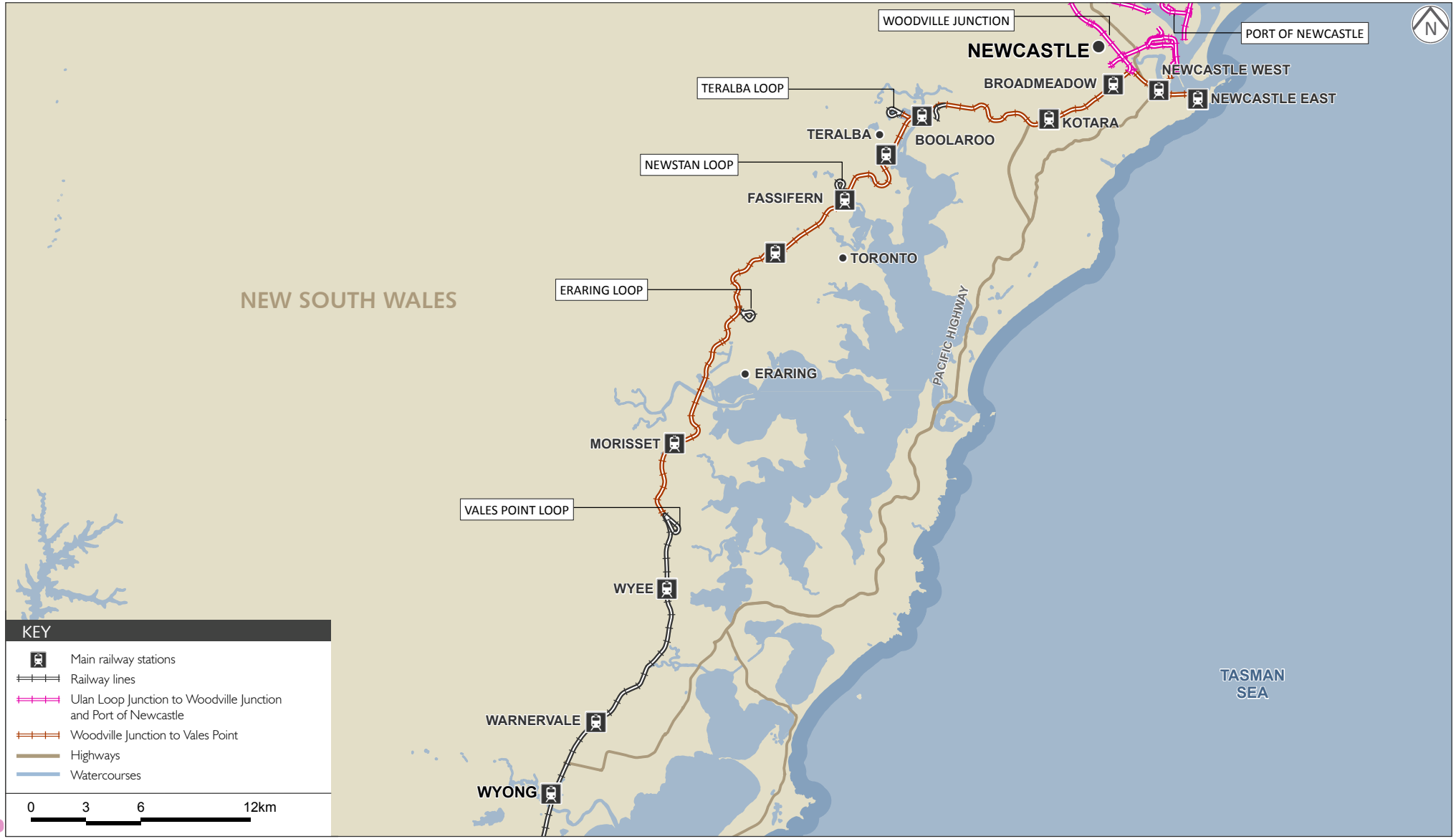
Cobbora Coal Project - Rail Transport Assessment

Figure A. I

ARTC Network Lines from Ulan to Newcastle

Cobbora Coal Project - Rail Transport Assessment

Figure A.2



Railcorp Network Lines South of Newcastle

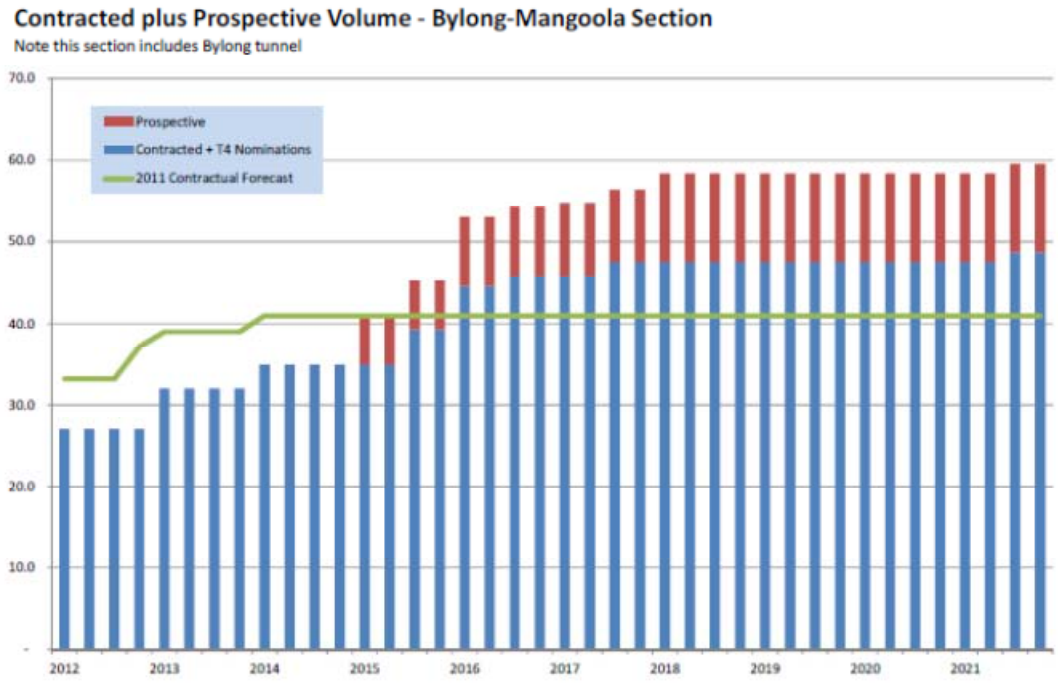
Cobbora Coal Project - Rail Transport Assessment

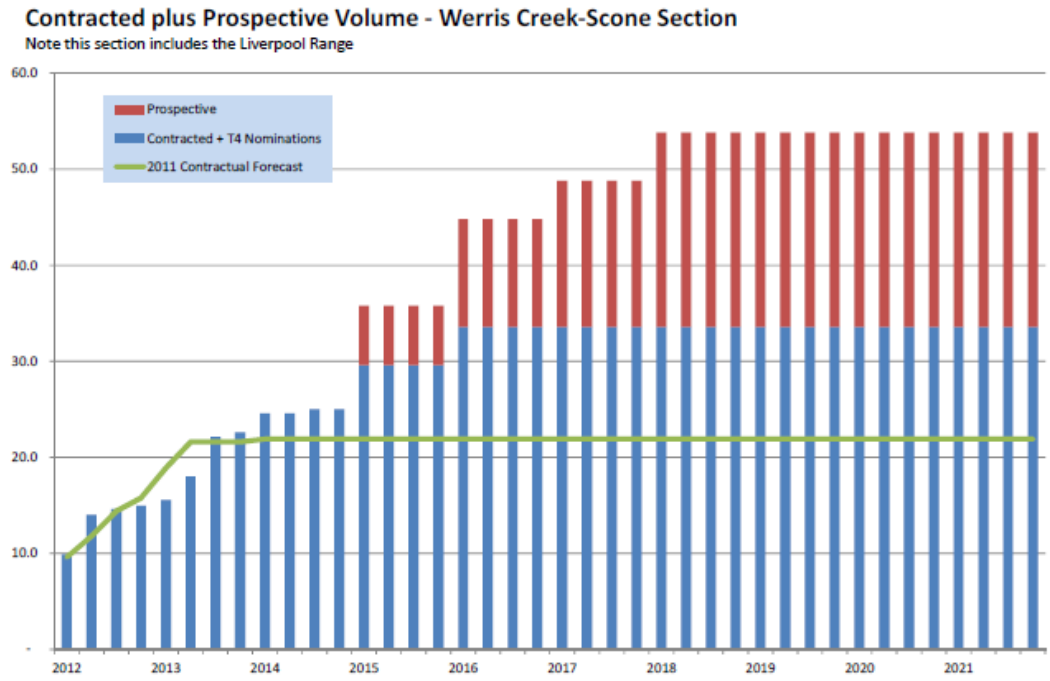
Figure A.3

Appendix B

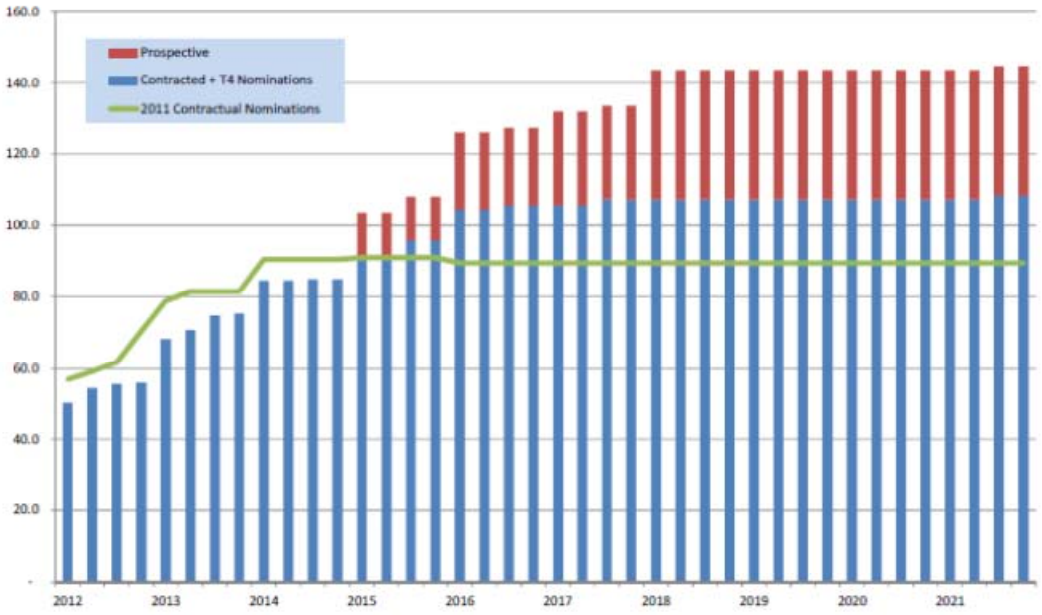
Future Demand for Coal Train Paths 2011-2015

Projected Coal Transport Volumes from ARTC 2012-2021 Strategy

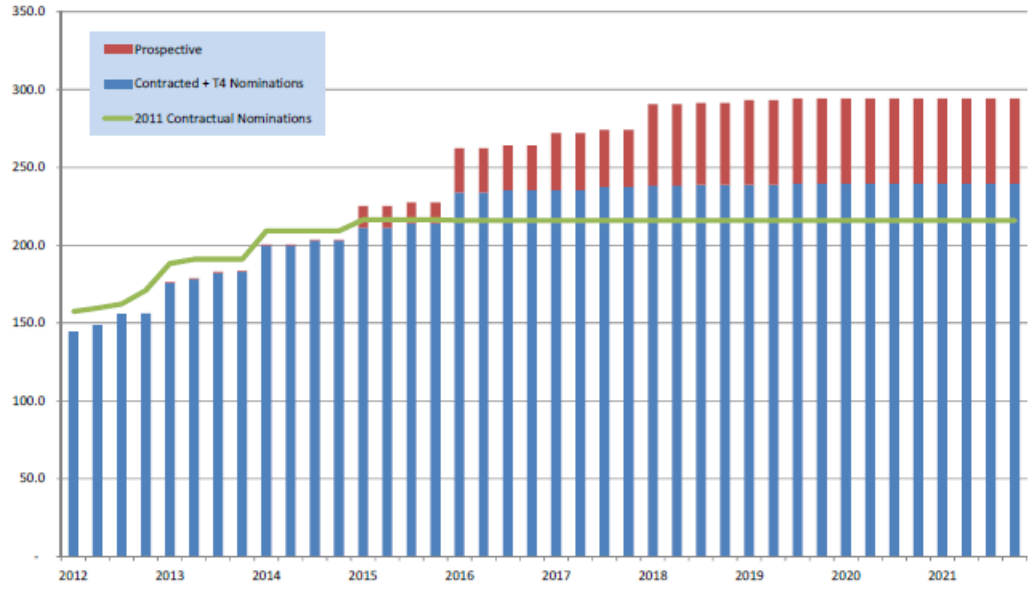




Contracted plus Prospective Volume at Muswellbrook



Contracted plus Prospective Volume at Newcastle Ports



Appendix C

Current Timetable Capacity for Coal Train Paths

SECTION 3	TB428	TB428	NW438	001N	4441	003N	TB402	007N	011N	015N	ER471	9537	017N	9537	ER473	
Consist																
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	
LENGTH (M)	1360	1360	800	1200	350	1000	1360	1000	1000	1000	760	850	1000	850	760	
COMMODITY	Coal	Spare	Coal	Spare	General	Spare	Spare	Spare	Spare	Spare	Coal	Grain	Spare	Grain	Coal	
OPERATOR	PNC	RailCorp	PNC	RailCorp	SSRS	RailCorp	RailCorp	RailCorp	RailCorp	RailCorp	PNC	PNRB	RailCorp	PNRB	PNC	
SCHEDULE	8GL	8GL	6CL	C1	C1	C2	8GL	C2	C2	C1	5CE	C	A1	C	5CE	
PATH TYPE	T	S	F	S		S	S	S	S	S	T	T	S	T	F	
	Tu to F	MO	Tu to F	MO	MO							MO	MO	ThO		
Enfield arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	**00 12**	.	**00 39**	.	**01 08**	**01 41**	**02 03**	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctn West arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctns	.	.	.	00 19	.	00 46	.	01 15	01 48	02 10	.	.	.	.	.	.
Flemington Gds South	.	.	.	00 24	.	00 51	.	01 20	01 53	02 15	.	.	.	From	.	.
Flemington Gds Jctns arr	.	.	.	.	.	.	.	.	.	.	.	.	.	Bomaderry	.	.
dep	.	.	.	00 28	.	00 54	.	01 23	01 56	02 18	.	.	.	(Nowra)	.	.
												UG	**UG**	**UG**		
Flemington Markets arr	.	.	.	.	.	.	.	.	.	02 25	.	.	.	.	.	.
dep	.	.	.	00 34	.	01 00	.	01 29	02 02	02 35x	.	**03 07x**	**03 25**	03 19	.	.
Homebush Loop	.	.	.	00 37	.	01 04	.	01 33	02 06	02 40	.	03 13	03 29	03 25	.	.
				XNM		**XNM**		**R**	**XNM**	**R**		**R**	**XNM**	**R**		
Nth Strathfield Jctn	.	.	.	00 39	.	01 05	.	01 34	02 07	02 42	.	03 14	03 31	03 26	.	.
Concord West	.	.	.	00 42	.	01 08	.	01 37	02 10	02 45	.	03 17	03 34	03 29	.	.
Rhodes arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	00 44	.	01 10	.	01 39	02 12	02 47	.	03 19	03 36	03 31	.	.
								XDM		**XDM**		**XDM**		**XDM**		
West Ryde	.	.	.	00 46	.	01 12	.	01 41	02 14	02 49	.	03 21	03 38	03 33	.	.
				S		**S**		**S**	**S**	**S**		**S**	**S**	**S**		
Eastwood arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	00 51	.	01 19	.	01 48	02 21	02 54	.	03 23	03 41	03 36	.	.
Epping	.	.	.	00 54	.	01 21	.	01 50	02 23	02 57	.	03 26	03 44	03 38	.	.
Thornleigh Dn Relief arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	.	.	.	01 06	.	01 34	.	02 03	02 36	03 09	.	03 33	03 53	03 45	.	.
Hornsby	.	.	.	01 11	.	01 39	.	02 08	02 41	03 14	.	03 37	03 57	03 49	.	.
Hornsby C.S. Jctn	.	.	.	01 13	.	01 42	.	02 11	02 44	03 16	.	03 38	03 58	03 50	.	.
Hornsby 2 Down T/B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asquith	.	.	.	**...**	.	**...**	.	**...**	**...**	**...**	.	**...**	**...**	**...**	.	.
Berowra	.	.	.	01 21	.	01 51	.	02 20	02 53	03 24	.	03 46	04 06	03 58	.	.
Cowan	.	.	.	01 25	.	01 55	.	02 24	02 57	03 28	.	03 50	04 10	04 02	.	.
Hawkesbury River	.	.	.	01 35	.	02 05	.	02 34	03 07	03 38	.	04 00	04 20	04 12	.	.
Woy Woy	.	.	.	01 50	.	02 20	.	02 49	03 22	03 53	.	04 14	04 34	04 27	.	.
Gosford arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	01 57	.	02 27	.	02 56	03 29	04 00	.	04 21	04 41	04 34	.	.
Gosford Down Refuge arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	.	.	.	01 58	.	02 28	.	02 57	03 30	04 01	.	04 22	04 42	04 35	.	.
Wyong	.	.	.	02 13	.	02 44	.	03 13	03 46	04 16	.	04 37	04 55	04 51T	.	.
Wyee	.	.	.	02 25	.	02 56	.	03 25	03 58	04 28	Not to	04 48	05 04	05 04T	Not to	.
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	run when	.	.	.	run when	.
Vales Point Jctn	.	.	.	02 30	.	03 01	.	03 30	04 03	04 33	ER473	04 51	05 07	05 06	ER471	.
Morisset	.	.	.	02 33	.	03 04	.	03 33	04 06	04 36	runs	04 55	05 10	05 11	runs	.
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	**04 46**	.	.	.	**05 24**	.
Eraring Colliery Jct	.	.	.	02 43	.	03 15	.	03 44	04 17	04 46	04 51	05 03	05 19	05 19	05 30	.
Awaba	.	.	.	02 48	.	03 20	.	03 49	04 22	04 51	04 55	05 08	05 23	05 23	05 36	.
Fassifern	.	.	.	02 52	.	03 25	.	03 54	04 27	04 55	04 59	05 12	05 27	05 27	05 40	.
Newstan Colliery	.	.	**01 15**	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	.	.	01 25	02 52	.	03 26	.	03 55	04 28	04 55	05 00	05 12	05 27	05 27	05 41	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	**00 50**	**01 20**	.	.	.	.	**03 29**	.	.	.	.	.	.	.	.	.
Teralba Colliery Jct	01 00	01 30	01 37	02 59	.	03 32	03 39	04 01	04 34	05 02	05 06	05 18	05 34	05 34	05 47	.
Sulphide Jctn Yard arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	01 04	01 34	01 39	03 01	.	03 36	03 43	04 05	04 38	05 04	05 09	05 21	05 36	05 37	05 50	.
Sulphide Junction	01 07	01 37	01 40	03 01	.	03 36	03 46	04 05	04 38	05 04	05 09	05 22	05 37	05 37	05 50	.
Adamstown	01 26	01 56	01 51	03 11	.	03 46	04 05	04 15	04 48	05 14	05 19	05 32	05 47	05 47	06 02T	.
			R	**DYD**		**DYD**		**DYD**	**DYD**	**DYD**	**TR**	**R**	**TR**			
Broadmeadow Yard arr	.	.	.	**03 16**	.	**03 51**	.	**04 20**	**04 53**	**05 19**	05 24	05 36	**05 52**	.	.	.
dep	01 30	02 00	01 52		**03 32**		04 09				05 35x	05 40T		05 48	06 06T	.
					R						**R**					
Broadmeadow	01 31	02 01	01 54	.	03 34	.	04 10	.	.	.	05 38	05 44	.	05 50	06 11T	.
Woodville Junction	01 35	02 05	01 58	.	03 38	.	04 14	.	.	.	05 42	05 48	.	05 54	06 15	.
Islington Junction arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	06 18	.
dep	01 37	02 07	02 00	.	03 40	.	04 16	.	.	.	05 44	05 50	.	05 56	06 26x	.
Forms or Destination	Kooragang Coal Ldr	Kooragang Coal Ldr	Kooragang Coal Ldr		Bullock Island		Kooragang Coal Ldr				Kooragang Coal Ldr	Gunnedah		Gunnedah	Kooragang Coal Ldr	

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:09).

SECTION 3	TB406	JW61	023N	3MB2	4MB2	027N	2MB7	3MB7	4MB7	5MB7	ER477	2MB4	3MB4	4MB4	5MB4
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	1360	850	1000	1500	1500	1100	1200	1200	1200	1200	760	1500	1500	1500	1500
COMMODITY	Coal	Coal	Spare	General	General	Spare	General	General	General	General	Coal	General	General	General	General
OPERATOR	PNC	PNC	RailCorp	PNIN	PNIN	RailCorp	INTRL	INTRL	INTRL	INTRL	PNC	PNIN	PNIN	PNIN	PNIN
SCHEDULE	8GL	1CE	A1	A1	A1	A1	A1	A1	A1	A1	5CE	A1	A1	A1	A1
PATH TYPE	T	T	S	T	T	S					F	T	T	T	T
			M.Tu.F	WO	ThO	MO	TuO	WO	ThO	FO		TuO	WO	ThO	FO
Enfield ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	**03 44**	**04 47**	.	.	**09 07**	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	**04 48**	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	**04 07**	.	.	.	.	.	.	**09 39**	**09 39**	**09 39**	**09 39L**
Chullora Jctns	.	03 51	04 54	04 55	04 08	09 14	.	.	.	.	.	09 40	09 40	09 40	09 40
Flemington Gds South	.	03 56	04 59	05 00	04 13	09 19	.	.	.	.	.	09 45	09 45	09 45	09 45
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	From Macarthur	.	From Macarthur	From Macarthur	.	.	.	.	.
dep	.	03 59	05 02	05 03	04 16	09 23	**UG**	**UG**	**UG**	**UG**	.	09 48	09 48	09 48	09 48
Flemington Markets ..... **arr**	.	.	.	.	04 22	.	.	.	.	.	.	09 55	09 55	09 55	09 56
dep	.	04 05	05 08	05 09	05 07T	09 29	09 23	09 23	09 23	09 23	.	10 34x	10 34x	10 34x	10 34x
Homebush Loop	.	04 09	05 12	05 13	05 12	09 32	09 26	09 26	09 26	09 26	.	10 40	10 40	10 40	10 40
		XNM	**XNM**	**XNM**	**XNM**	**R**	**R**	**R**	**R**	**R**		**R**	**R**	**R**	**R**
Nth Strathfield Jctn	.	04 10	05 13	05 14	05 14	09 34	09 31T	09 31T	09 31T	09 30T	.	10 42	10 42	10 42	10 42
Concord West	.	04 13	05 16	05 17	05 17	09 37	09 34	09 34	09 34	09 33	.	10 45	10 45	10 45	10 45
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	04 16	05 18	05 19	05 19	09 39	09 36	09 36	09 36	09 35	.	10 47	10 47	10 47	10 47
						XDM	**XDM**	**XDM**	**XDM**	**XDM**		**XDM**	**XDM**	**XDM**	**XDM**
West Ryde	.	04 18	05 20	05 21	05 21	09 41	09 39T	09 40T	09 39T	09 37	.	10 50T	10 50T	10 50T	10 50T
		S	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**		**S**	**S**	**S**	**S**
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	04 23	05 24	05 25	05 24	09 44	09 45T	09 45T	09 45T	09 40	.	10 53	10 53	10 53	10 53
Epping	.	04 25	05 26	05 27	05 27	09 49T	09 49T	09 48	09 49T	09 43	.	10 56	10 56	10 56	10 56
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	.	04 37	05 35	05 36	05 36	10 00T	09 59T	09 58T	09 59T	09 52	.	11 05	11 05	11 05	11 05
			R	**R**	**R**	**R**	**R**	**R**	**R**	**R**		**R**	**R**	**R**	**R**
Hornsby	.	04 42	05 40	05 41	05 40	10 05T	10 03	10 03	10 03	09 57	.	11 10T	11 10T	11 10T	11 10T
						DM	**DM**	**DM**	**DM**	**DM**					
Hornsby C.S. Jctn	.	04 44	05 41	05 42	05 41	10 07	10 05	10 04	10 05	09 58	.	11 11	11 11	11 11	11 11
Hornsby 2 Down T/B	.	.	05 41	05 42	05 41	.	.	.	.	.	.	11 11	11 11	11 11	11 11
			DM	**DM**	**DM**							**DM**	**DM**	**DM**	**DM**
Asquith	.	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	.	**...**	**...**	**...**	**...**
			R	**R**	**R**	**R**	**R**	**R**	**R**	**R**					
Berowra	.	04 52	05 49	05 50	05 49	10 15	10 13	10 12	10 13	10 07T	.	11 22T	11 22T	11 22T	11 22T
			XM	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**					
Cowan	.	04 56	05 54	05 54	05 54	10 19	10 17	10 16	10 17	10 11	.	11 26	11 26	11 26	11 26
Hawkesbury River	.	05 06	06 04	06 04	06 04T	10 29	10 27	10 26	10 27	10 21	.	11 36	11 36	11 36	11 36
Woy Woy	.	05 22	06 18	06 18	06 18	10 43	10 41	10 40	10 41	10 35	.	11 50	11 50	11 50	11 50
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	05 29	06 26	06 26T	06 26T	10 50	10 48	10 47	10 48	10 42	.	11 57	11 57	11 57	11 57
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	.	05 30	06 27	06 27	06 27	10 51	10 49	10 48	10 49	10 43	.	11 58	11 58	11 58	11 58
Wyong	.	05 45	06 41T	06 42T	06 42T	11 04	11 02	11 01	11 02	11 01T	.	12 11	12 11	12 11	12 11
Wyee	.	05 57	06 52T	06 53T	06 53T	11 15T	11 13T	11 13T	11 13T	11 13T	.	12 20	12 20	12 20	12 20
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	.	06 01	06 55	06 55	06 55	11 20T	11 17T	11 17T	11 17T	11 17T	.	12 22	12 22	12 22	12 22
Morisset	.	06 05	06 58	06 59	06 59	11 24T	11 22T	11 22T	11 22T	11 22T	.	12 26	12 26	12 26	12 26
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	**11 34**	.	.	.	.
Eraring Colliery Jct	.	06 16	07 07	07 07	07 07	11 33	11 30	11 30	11 30	11 30	11 39	12 34	12 34	12 34	12 34
Awaba	.	06 21	07 12T	07 13T	07 13T	11 38T	11 36T	11 36T	11 36T	11 36T	11 43	12 39	12 39	12 39	12 39
Fassifern	.	06 25	07 18T	07 19T	07 19T	11 43T	11 41T	11 41T	11 41T	11 41T	11 47	12 44T	12 44T	12 44T	12 44T
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	.	06 26	07 19	07 19	07 19	11 43	11 41	11 41	11 41	11 41	11 48	12 44	12 44	12 44	12 44
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	**05 45**	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery Jct	05 55	06 32	07 25	07 25	07 25	11 51T	11 48T	11 48T	11 48T	11 48T	11 54	12 50	12 50	12 50	12 50
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	05 59	06 35	07 28	07 28	07 28	11 54	11 52	11 52	11 52	11 52	11 59	12 54	12 54	12 54	12 54
Sulphide Junction	06 02	06 35	07 28	07 29	07 29	11 55	11 53	11 53	11 53	11 52	11 59	12 54	12 54	12 54	12 54
Adamstown	06 21	06 45	07 38T	07 39	07 39	12 05	12 03	12 03	12 03	12 03	12 15T	13 06	13 06	13 06	13 06
		R	**TR**			**DYD**					**TR**				
Broadmeadow Yard ..... **arr**	.	**06 49L**	**07 43**	.	.	**12 10**	.	.	.	.	.	.	.	.	.
dep	06 25	**06 56x**	—	07 40	07 40	—	12 04	12 04	12 04	12 04	12 16	13 07	13 07	13 07	13 07
											R				
Broadmeadow	06 26	07 00	.	07 42	07 42	.	12 06	12 06	12 06	12 06	12 18T	13 09	13 09	13 09	13 09
Woodville Junction	06 30	07 04	.	07 46	07 46	.	12 10	12 10	12 10	12 10	12 22	13 13	13 13	13 13	13 13
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	06 32	07 06	.	07 50T	07 50T	.	12 12	12 12	12 12	12 12	12 24	13 15	13 15	13 15	13 15
	Kooragang Coal Ldr	Mt Thorley		Acacia Ridge	Acacia Ridge		Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge	Kooragang Coal Ldr	Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge
Forms or Destination															

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:10).

SECTION 3	031N	TB410	JW73	035N	039N	014M	014M	3AB6	014M	2MB2	029B	031B	027B	TB414	041N
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	1500	1360	850	1000	1000	500	500	1500	500	1500	1500	1500	1500	1360	740
COMMODITY	Spare	Coal	Coal	Spare	Spare	Spare	Spare	General	Spare	General	Spare	Spare	Spare	Coal	Spare
OPERATOR	RailCorp	PNC	PNC	RailCorp	RailCorp	RailCorp	RailCorp	PNIN	RailCorp	PNIN	RailCorp	RailCorp	RailCorp	PNC	RailCorp
SCHEDULE	A1	8GL	1CE	C1	C1	A1	A1	A1	A1	A1	A1	A1	A1	8GL	C
PATH TYPE	S	T	T	S	S	S	S	T	S	T	S	S	S	T	S
	MO				MO	TuO	WO	ThO	FO	TuO	WO	Th.F	MO		Tu.Th.F
Enfield arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	**10 16**	.	**10 37**	**11 36**	.	.	.	.	.	.	**12 46**	**12 46**	**12 46**	.	**13 17**
Chullora SOY	.	.	.	.	.	.	.	**11 45**	.	**12 46L**	.	.	.	.	.
Chullora Jctn West arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	From	.	.	.	.	.	.	.	.	.	.
Chullora Jctns	10 23	.	10 44	11 43	Clyde Up	.	.	11 51T	.	12 53	12 53	12 53	12 53	.	13 24
Flemington Gds South	10 28	.	10 49	11 48	Yards	.	.	11 56	.	12 58	12 58	12 58	12 58	.	13 29
Flemington Gds Jctns arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 32	.	10 52	11 52	12 22T	.	.	11 59	.	13 01	13 02	13 02	13 02	.	13 32
						UG	**UG**		**UG**						
Flemington Markets arr	.	.	.	.	.	.	.	12 06	.	.	.	.	.	.	.
dep	10 38	.	10 58	11 58	12 28	**12 26**	**12 26**	12 26T	**12 26**	13 07	13 08	13 08	13 08	.	13 38
Homebush Loop	10 41	.	11 02	12 01	12 31	12 31	12 31	12 31	12 31	13 11	13 11	13 11	13 11	.	13 41
	R		**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**		**XNM**
Nth Strathfield Jctn	10 43	.	11 03	12 03	12 33	12 33	12 33	12 33	12 33	13 12	13 13	13 13	13 13	.	13 43
Concord West	10 46	.	11 06	12 06	12 36	12 36	12 36	12 36	12 36	13 15	13 16	13 16	13 16	.	13 46
Rhodes arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 48	.	11 09	12 08	12 38	12 38	12 38	12 38	12 38	13 17	13 18	13 18	13 18	.	13 48
	XDM														
West Ryde	10 50	.	11 11	12 10	12 40	12 40	12 40	12 40	12 40	13 19	13 20	13 20	13 20	.	13 50
	S		**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**		**S**
Eastwood arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 53	.	11 16	12 15T	12 46T	12 46T	12 46T	12 46T	12 46T	13 23	13 23	13 23	13 23	.	13 52
Epping	10 56	.	11 18	12 19T	12 49T	12 49T	12 49T	12 49T	12 49T	13 25	13 26	13 26	13 26	.	13 55
Thornleigh Dn Relief arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	11 05	.	11 30	12 31	13 01	13 01	13 01	13 01	13 01	13 34	13 35	13 35	13 35	.	14 02
	R		**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**		**R**
Hornsby	11 10	.	11 36	12 37T	13 07T	13 07T	13 07T	13 07T	13 07T	13 39	13 39	13 39	13 39	.	14 06
			DM	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**		
Hornsby C.S. Jctn	11 11	.	11 38	12 39	13 09	13 09	13 09	13 09	13 09	13 40	13 40	13 40	13 40	.	14 07
Hornsby 2 Down T/B	11 11	.	.	.	.	.	.	.	.	.	.	.	.	.	14 07
	DM														**DM**
Asquith	**...**	.	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	.	**...**
			R												
Berowra	11 22T	.	11 46	12 47	13 17	13 17	13 17	13 17	13 17	13 48	13 48	13 48	13 48	.	14 15
			XM												
Cowan	11 26	.	11 50	12 51	13 21	13 21	13 21	13 21	13 21	13 52	13 52	13 52	13 52	.	14 19
Hawkesbury River	11 36	.	12 00	13 01	13 31	13 31	13 31	13 31	13 31	14 02	14 02	14 02	14 02	.	14 29
Woy Woy	11 50	.	12 16	13 16	13 46	13 46	13 46T	13 46	13 46T	14 16	14 16	14 16	14 16	.	14 43
Gosford arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	11 57	.	12 23	13 23	13 53	13 53	13 53	13 53	13 53	14 23	14 23	14 23	14 23	.	14 50
Gosford Down Refuge arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	11 58	.	12 24	13 24	13 54	13 54	13 54	13 54	13 54	14 24	14 24	14 24	14 24	.	14 51
Wyong	12 11	.	12 39	13 40T	14 09	14 09	14 09	14 09	14 09	14 38T	14 38T	14 38T	14 38T	.	15 06
Wyee	12 20	.	12 51	13 52	14 21	14 21	14 21	14 21	14 21	14 47	14 47	14 47	14 47	.	15 17
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	12 23	.	12 55	13 56	14 26	14 25	14 25	14 25	14 25	14 49	14 49	14 49	14 50	.	15 20
Morisset	12 26	.	12 59	14 00	14 29	14 29	14 29	14 29	14 29	14 53	14 53	14 53	14 53	.	15 24
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery Jct	12 35	.	13 10	14 09	14 39	14 38	14 38	14 38	14 38	15 01	15 01	15 01	15 02	.	15 32
Awaba	12 39	.	13 15	14 15	14 44	14 44	14 44	14 44	14 44	15 06	15 06	15 06	15 06	.	15 37
Fassifern	12 44T	.	13 19	14 19	14 48	14 48	14 48	14 48	14 48	15 10	15 10	15 10	15 10	.	15 41
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	12 44	.	13 20	14 19	14 48	14 48	14 48	14 48	14 48	15 10	15 10	15 10	15 11	.	15 41
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	.	**12 45**	.	.	.	.	.	.	.	.	.	.	.	**15 10**	.
Teralba Colliery Jct	12 50	12 55	13 26	14 25	14 55	14 54	14 54	14 54	14 54	15 16	15 16	15 16	15 17	15 20	15 47
Sulphide Jctn Yard arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	12 54	12 59	13 29	14 28	14 57	14 57	14 57	14 57	14 57	15 19	15 19	15 19	15 20	15 24	15 50
Sulphide Junction	12 54	13 02	13 29	14 29	14 58	14 58	14 58	14 58	14 58	15 20	15 20	15 20	15 20	15 27	15 51
Adamstown	13 06	13 21	13 39	14 39	15 08	15 08	15 08	15 08	15 08	15 30	15 30	15 30	15 30	15 46	16 01
	DYD		**R**	**DYD**	**DYD**	**R**	**R**	**R**	**R**		**DYD**			**R**	**DYD**
Broadmeadow Yard arr	**13 11**	.	**13 43L**	**14 44**	**15 13**	15 12	15 12	15 12	15 12	.	**15 35**	.	.	.	**16 06**
dep		13 25	**14 06x**			15 21	15 21	15 21	15 21	15 31		15 31	15 32	15 49	
Broadmeadow	.	13 26	14 10	.	.	15 25	15 25	15 25	15 25	15 33	.	15 33	15 33	15 54T	.
Woodville Junction	.	13 30	14 14	.	.	15 29	15 29	15 29	15 29	15 37	.	15 37	15 37	15 58	.
Islington Junction arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	13 32	14 16	.	.	15 31	15 31	15 31	15 31	15 39	.	15 39	15 39	16 01T	.
Forms or Destination		Kooragang Coal Ldr	Mt Thorley			Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge		Acacia Ridge	Acacia Ridge	Kooragang Coal Ldr	

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
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Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:10).

SECTION 3	1581	043N	1443	4443	TB418	TB420	049N	TB422	1511	053N	057N	NW436	1431	063N	1565
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	600	1000	550	550	1010	1010	550	1360	900	1000	1000	800	900	1000	600
COMMODITY	General	Spare	General	General	Spare	Spare	Spare	Coal	General	Spare	Spare	Coal	Steel	Spare	General
OPERATOR	FLA	RailCorp	SSRS	SSRS	RailCorp	RailCorp	RailCorp	PNC	SSRS	RailCorp	RailCorp	PNC	PNIN	RailCorp	IRA
SCHEDULE	C	A1	C	C	8CL	8CL	C1	8GL	C1	C1	C2	6CL	C1	C1	C
PATH TYPE		S			S	S	S	T		S	S	F	T	S	
	M.W	MO	Tu to F	MO					M.W.F				M.W	Tu.Th.F	Tu.Th
Enfield ..... arr	.	.	**14 11L**	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 21	**14 16**	**14 16**	.	.	.	**17 51**	.	18 32	**19 05**	**19 36**	.	.	**20 36**	21 02
Chullora SOY	From	.	From	.	.	.	.	.	From	.	.	.	**20 38**	.	From
Chullora Jctn West ..... arr	Botany	.	Cooks	.	.	.	.	.	Botany	.	.	.	.	.	Botany
dep	.	.	River	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctns	13 26	14 23	14 23	.	.	.	17 58	.	18 37	19 12	19 43	.	20 43	20 43	21 07
Flemington Gds South	13 31	14 28	14 28	.	.	.	18 03	.	18 42	19 17	19 48	.	20 48	20 48	21 12
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 34	14 32	14 31	.	.	.	18 07	.	18 45	19 21	19 52	.	20 51	20 52T	21 16
Flemington Markets ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 40	14 38	14 37	.	.	.	18 13	.	18 51	19 27	19 58	.	20 57	20 58	21 23
Homebush Loop	13 43	14 41	14 40	.	.	.	18 17	.	18 55	19 30	20 01	.	21 01	21 01	21 26
	XNM	**XNM**	**XNM**				**R**		**R**	**R**	**R**		**XNM**	**XNM**	**R**
Nth Strathfield Jctn	13 45	14 43	14 42	.	.	.	18 18	.	18 57T	19 32	20 03	.	21 02	21 03	21 28
Concord West	13 48	14 46	14 45	.	.	.	18 21	.	19 02T	19 35	20 06	.	21 05	21 06	21 33
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 50	14 48	14 47	.	.	.	18 23	.	19 05T	19 37	20 08	.	21 07	21 08	21 36
							XDM		**XDM**	**XDM**	**XDM**				**XDM**
West Ryde	13 52	14 50	14 49	.	.	.	18 25	.	19 09T	19 39	20 10	.	21 09	21 10	21 41
	S	**S**	**S**				**S**		**S**	**S**	**S**		**S**	**S**	**S**
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 54	14 53	14 52	.	.	.	18 30T	.	19 16T	19 44	20 16	.	21 15	21 15	21 44T
Epping	13 57	14 56	14 54	.	.	.	18 33T	.	19 19T	19 47	20 19	.	21 18	21 18	21 48T
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	14 04	15 05	15 03	.	.	.	18 45	.	19 31	19 59	20 32	.	21 30	21 30	22 00T
	R	**R**	**R**				**R**		**R**	**R**	**R**		**R**	**R**	**R**
Hornsby	14 08	15 09	15 08T	.	.	.	18 52T	.	19 37T	20 04	20 37	.	21 36T	21 36T	22 07T
		DM	**DM**				**DM**		**DM**						
Hornsby C.S. Jctn	14 09	15 10	15 09	.	.	.	18 54	.	19 39	20 06	20 40	.	21 37	21 37	22 08
Hornsby 2 Down T/B	14 09	.	.	.	.	.	.	.	.	20 06	20 40	.	21 38	21 38	22 08
	DM									**DM**	**DM**		**DM**	**DM**	**DM**
Asquith	**...**	**...**	**...**	.	.	.	**...**	.	**...**	**...**	**...**	.	**...**	**...**	**...**
							R								**R**
Berowra	14 17	15 18	15 17	.	.	.	19 03	.	19 47	20 14	20 49	.	21 46	21 46	22 17
							XM								**XM**
Cowan	14 21	15 22	15 21	.	.	.	19 08	.	19 51	20 18	20 53	.	21 50	21 50	22 21T
Hawkesbury River	14 31	15 32	15 31	.	.	.	19 18	.	20 01	20 28	21 03	.	22 00	22 00	22 31T
Woy Woy	14 45	15 46	15 45	.	.	.	19 33	.	20 16	20 43	21 18	.	22 15	22 15	22 45
Gosford ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	14 52	15 53	15 52	.	.	.	19 40	.	20 23	20 50	21 25	.	22 22	22 25T	22 52
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	14 53	15 54	15 53	.	.	.	19 41	.	20 24	20 51	21 26	.	22 23	22 26	22 53
Wyong	15 08	16 07	16 08	.	.	.	19 56	.	20 40T	21 06	21 42	.	22 38	22 44T	23 08
Wyee	15 19	16 20T	16 21T	.	.	.	20 08	.	20 52	21 18	21 54	.	22 50	22 56	23 19
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	15 22	16 24T	16 24T	.	.	.	20 13	.	20 56	21 23	21 59	.	22 54	23 00	23 22
Morisset	15 26	16 30T	16 30T	.	.	.	20 16	.	21 00	21 26	22 02	.	22 58	23 04	23 26
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery Jct	15 34	16 38	16 38	.	.	.	20 25	.	21 09	21 36	22 13	.	23 07	23 13	23 35T
Awaba	15 39	16 43	16 43T	.	.	.	20 31	.	21 15	21 41	22 18	.	23 13	23 19	23 40T
Fassifern	15 43	16 48T	16 48T	.	.	.	20 35	.	21 19	21 45	22 23	.	23 17	23 23	23 45T
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	**22 45**	.	.	.
Newstan Colliery Jct	15 43	16 48	16 48	.	.	.	20 35	.	21 19	21 45	22 23	22 55	23 17	23 23	23 46
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	.	.	.	.	**16 50**	**20 02**	.	**20 59**	.	.	.	.	.	.	.
Teralba Colliery Jct	15 49	16 54	16 55T	.	17 00	20 12	20 41	21 09	21 25	21 52	22 30	23 07	23 23	23 29	23 52
Sulphide Jctn Yard ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	15 52	16 57	16 58	.	17 04	20 16	20 44	21 13	21 28	21 55	22 34	23 09	23 26	23 32	23 55
Sulphide Junction	15 53	16 59T	16 59	.	17 06	20 18	20 45	21 16	21 29	21 55	22 34	23 10	23 27	23 33	23 56
Adamstown	16 03	17 09T	17 09	.	17 23	20 35	20 55	21 35	21 39	22 05	22 44	23 22T	23 37	23 43	00 06
	DYD	**DYD**					**DYD**		**R**	**DYD**	**TR**			**DYD**	**DYD**
Broadmeadow Yard ..... arr	16 07	**17 14**	.	.	.	.	**21 00**	.	21 43	**22 10**	**22 49**	.	.	**23 48**	**00 10S**
dep	16 12L	—	17 10	**17 15**	17 24	20 36	—	21 39	21 46	—	—	23 24T	23 38	—	**00 52**
	R			**R**											**R**
Broadmeadow	16 15	.	17 12	17 17	17 26	20 38	.	21 40	21 50	.	.	23 27T	23 40	.	00 56
	XM														
Woodville Junction	16 20T	.	17 17T	17 22	17 30	20 42	.	21 44	21 54	.	.	23 32T	23 44	.	01 00
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	16 22	.	17 21T	17 24	17 33T	20 44	.	21 46	21 56	.	.	23 36T	23 46	.	01 02
Forms or Destination	Narrabri		Walsh Point	Walsh Point	Kooragang Coal Ldr	Kooragang Coal Ldr		Kooragang Coal Ldr	Narrabri			Kooragang Coal Ldr	Morandoo		Narrabri

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS

SECTION 3	065N	2WB3	3WB3	4WB3	051B	SF69	1YN2	2YN2	3YN2	4YN2	002Y	1423	1411	1411		
Consist																
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght		
LENGTH (M)	900	1200	1200	1200	1200	850	1200	1200	1200	1200	1200	400	635	635		
COMMODITY	Spare	Steel	Steel	Steel	Spare	Coal	Steel	Steel	Steel	Steel	Spare	General	General	General		
OPERATOR	RailCorp	PNIN	PNIN	PNIN	RailCorp	PNC	PNIN	PNIN	PNIN	PNIN	RailCorp	PNRB	SSRS	SSRS		
SCHEDULE	C1	C2	C2	C2	C2	1CE	C1	C1	C1	C1	C1	C2	C1	C1		
PATH TYPE	S	T	T	T	S	T	T	T	T	T	S	T				
	M.W.F	MO	TuO	WO	ThO	FO	MO	TuO	WO	ThO	FO		FO	M to Th		
Enfield ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	23 31L	**23 34L**	.	.
dep	**21 00**	**21 13**	**21 13**	**21 13**	**21 13**	21 34	.	.	.	.	.	.	00 02x	**23 51**	.	.
Chullora SOY	.	.	.	.	.	From	.	.	.	.	.	.	From	From	.	.
Chullora Jctn West ..... arr	.	.	.	.	.	Inner	.	.	.	.	.	.	Botany	Botany	.	.
dep	.	.	.	.	.	Harbour	**22 12**	**22 12**	**22 12L**	**22 12L**	**22 12**	From	.	.	.	.
Chullora Jctns	21 07	21 20	21 20	21 20	21 20	21 39	22 13	22 13	22 13	22 13	22 13	Clyde Up	00 08	23 58	.	.
Flemington Gds South	21 12	21 25	21 25	21 25	21 25	21 44	22 18	22 18	22 18	22 18	22 18	Yards	00 14	00 03	.	.
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	21 15	21 28	21 28	21 28	21 28	21 47	22 21	22 21	22 21	22 21	22 21	22 31	00 22T	00 06	.	.
Flemington Markets ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	21 21	21 35	21 35	21 35	21 35	21 53	22 27	22 27	22 27	22 27	22 27	22 37	00 32T	00 13T	.	.
Homebush Loop	21 26T	21 39T	21 39T	21 39T	21 39T	21 57	22 31	22 31	22 31	22 31	22 31	22 41	00 35	00 17T	.	.
	R	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**XNM**	**XNM**	**XNM**		
Nth Strathfield Jctn	21 28T	21 42T	21 42T	21 42T	21 42T	21 58	22 32	22 32	22 32	22 32	22 32	22 42	00 37	00 19	.	.
Concord West	21 33T	21 47T	21 47T	21 47T	21 47T	22 01	22 35	22 35	22 35	22 35	22 35	22 45	00 40	00 22	.	.
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	21 35	21 50T	21 50T	21 50T	21 50T	22 04	22 37	22 37	22 37	22 37	22 37	22 47	00 42	00 24	.	.
	XDM					**XDM**	**XDM**	**XDM**	**XDM**	**XDM**	**XDM**					
West Ryde	21 41T	21 52	21 52	21 52	21 52	22 06	22 40	22 40	22 40	22 40	22 40	22 49	00 44	00 26	.	.
	S	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**		
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	00 32	.	.
dep	21 46	22 00T	22 00T	22 00T	22 00T	22 11	22 45	22 45	22 45	22 45	22 45	22 57T	00 49	00 42x	.	.
Epping	21 49	22 04T	22 04T	22 04T	22 04T	22 13	22 48	22 48	22 48	22 48	22 48	23 04T	00 52	00 46	.	.
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	22 01	22 18	22 18	22 18	22 18	22 25	23 00	23 00	23 00	23 00	23 00	23 18	01 04	00 58	.	.
	R						**R**	**R**	**R**	**R**	**R**			**R**		
Hornsby	22 06	22 23	22 23	22 23	22 23	22 30	23 05	23 05	23 05	23 05	23 05	23 23	01 09	01 03T	.	.
Hornsby C.S. Jctn	22 08	22 25	22 25	22 25	22 25	22 32	23 07	23 07	23 07	23 07	23 07	23 25	01 11	01 05	.	.
Hornsby 2 Down T/B	22 08	.	.	.	.	.	23 07	23 07	23 07	23 07	23 07	.	.	01 05	.	.
	DM						**DM**	**DM**	**DM**	**DM**	**DM**			**DM**		
Asquith	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.	.
		R	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**		**R**		
Berowra	22 16	22 35	22 35	22 35	22 35	22 40	23 15	23 15	23 15	23 15	23 15	23 36	01 19	01 14	.	.
		XM	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**		**XM**		
Cowan	22 20	22 40	22 40	22 40	22 40	22 45	23 20	23 20	23 20	23 20T	23 19	23 41	01 23	01 19	.	.
Hawkesbury River	22 30	22 50	22 50	22 50	22 50	22 55T	23 30	23 30	23 30	23 30	23 30T	23 51	01 33	01 29T	.	.
Woy Woy	22 45	23 05	23 05	23 05	23 05	23 11	23 45	23 45	23 45	23 45	23 45	00 06	01 48	01 45T	.	.
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	22 52	23 12	23 12	23 12	23 12	23 18T	23 53T	23 53T	23 53T	23 53T	23 53T	00 13	01 55	01 54T	.	.
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	22 53	23 13	23 13	23 13	23 13	23 19	23 54	23 54	23 54	23 54	23 54	00 14	01 56	01 55	.	.
Wyong	23 08	23 29	23 29	23 29	23 29	23 34	00 12T	00 12T	00 12T	00 12T	00 12T	00 30	02 11	02 13T	.	.
Wyee	23 20	23 41	23 41	23 41	23 41	23 46	00 24	00 24	00 24	00 24	00 24	00 42	02 23	02 25	.	.
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	23 25	23 46	23 46	23 46	23 46	23 50	00 28	00 28	00 28	00 28	00 28	00 46	02 28	02 30	.	.
Morisset	23 28	23 49	23 49	23 49	23 49	23 54	00 32	00 32	00 32	00 32	00 32	00 50	02 31	02 33	.	.
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery Jct	23 38	24 00	24 00	24 00	24 00	00 05	00 41	00 41	00 41	00 41	00 41	01 00	02 41	02 43	.	.
Awaba	23 43	00 05	00 05	00 05	00 05	00 10	00 47	00 47	00 47	00 47	00 47	01 06	02 46	02 48	.	.
Fassifern	23 47	00 10	00 10	00 10	00 10	00 14	00 51	00 51	00 51	00 51	00 51	01 11	02 50	02 52	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	23 47	00 10	00 10	00 10	00 10	00 15	00 51	00 51	00 51	00 51	00 51	01 11	02 50	02 53	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery Jct	23 54	00 17	00 17	00 17	00 17	00 21	00 57	00 57	00 57	00 57	00 57	01 17	02 57	02 59	.	.
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	23 56	00 20	00 20	00 20	00 20	00 24	01 00	01 00	01 00	01 00	01 00	01 21	02 59	03 02	.	.
Sulphide Junction	23 57	00 21	00 21	00 21	00 21	00 24	01 01	01 01	01 01	01 01	01 01	01 22	02 59	03 02	.	.
Adamstown	00 07	00 31	00 31	00 31	00 31	00 34	01 11	01 11	01 11	01 11	01 11	01 32	03 12T	03 13	.	.
	DYD												**DYD**			
Broadmeadow Yard ..... **arr**	**00 12**	.	.	.	.	.	.	.	.	.	.	.	**03 16&**	.	.	.
dep	———	00 32	00 32	00 32	00 32	00 35	01 12	01 12	01 12	01 12	01 12	01 33	& Stage	03 14	.	.
													and Form			
Broadmeadow	.	00 34	00 34	00 34	00 34	00 37	01 14	01 14	01 14	01 14	01 14	01 35	4441	03 16	.	.
													Monday			
Woodville Junction	.	00 38	00 38	00 38	00 38	00 41	01 18	01 18	01 18	01 18	01 18	01 39	.	03 20	.	.
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	00 40	00 40	00 40	00 40	00 43	01 20	01 20	01 20	01 20	01 20	01 41	.	03 22	.	.
Forms or Destination		Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge	Stratford Colliery	Morandoo	Morandoo	Morandoo	Morandoo	Morandoo	Morandoo		Bullock Island		

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS

Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:12).

SECTION 3																
Consist																
Mondays to Fridays																
LENGTH (M)																
COMMODITY																
OPERATOR																
SCHEDULE																
PATH TYPE																
Enfield ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctns	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flemington Gds South	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flemington Markets ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Homebush Loop	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nth Strathfield Jctn	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Concord West	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
West Ryde	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Epping	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hornsby	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hornsby C.S. Jctn	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hornsby 2 Down T/B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asquith	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Berowra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cowan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hawkesbury River	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Woy Woy	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyong	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Morisset	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery Jct	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Awaba	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fassifern	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery Jct	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sulphide Junction	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Adamstown	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Broadmeadow Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Broadmeadow	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Woodville Junction	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Forms or Destination																

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS

SECTION 3	002N	5938	004N	5112	TB401	006N	5166	ER470	ER472	TB405	010N	014B	2NP3	3NY3	4132	
Consist																
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	
LENGTH (M)	1000	850	740	900	1360	600	600	760	760	1360	850	1500	900	900	600	
COMMODITY	Spare	Grain	Spare	General	Spare	Spare	General	Coal	Coal	Coal	Spare	Spare	General	Steel	Steel	
OPERATOR	RailCorp	PNRB	RailCorp	SSRS	RailCorp	RailCorp	IRA	PNC	PNC	PNC	RailCorp	RailCorp	PNIN	PNIN	PNIN	
SCHEDULE	C1	C1	C2	C2	3CE	C2	C2	8CL	8CL	3CE	C2	A1	C1	C1	C1	
PATH TYPE	S	T	S		S	S		T	F	T	S	S	T	T	T	
	M.W.Th	Tu.F	M.Tu.Th	W.F		M.W.F	Tu.Th				Tu.W.Th	Tu to F	MO	TuO	WO	
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	00 10	.	01 02	01 23	.	01 15	02 14	02 50	03 07	.	06 26	06 40	06 40	06 40	.
							R						**R**	**R**	**R**	
Woodville Junction	.	00 12	.	01 04	01 25	.	01 18	02 16	02 52	03 09	.	06 28	06 43T	06 43T	06 43T	.
Broadmeadow	.	00 16	.	01 08	01 29	.	01 22	02 20	02 56	03 13	.	06 32	06 48T	06 48T	06 48T	.
Broadmeadow Yard ..... **arr**	.	.	.	.	.	.	01 26	.	.	.	.	.	.	.	.	.
dep	**00 16**	00 17	**01 08**	01 09	01 30	**01 51**	01 51L	02 21	02 57	03 14	**05 23**	06 33	06 50	06 50	06 50	.
	XM		**XM**			**XM**	**XM**				**XM**		**XM**	**XM**	**XM**	
Adamstown	00 19	00 19	01 11	01 11	01 32	01 54	01 54	02 23	02 59	03 16	05 26	06 35	06 51	06 51	06 51	.
Sulphide Junction	00 28	00 28	01 21	01 21	01 43	02 04	02 04	02 38	03 14	03 27	05 36	06 43	07 00	07 00	07 00	.
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	05 39	.	.	.	.	.
dep	00 28	00 28	01 21	01 21	01 43	02 04	02 04	02 38	03 14	03 27	.	06 43	07 00	07 00	07 00	.
Teralba Colliery Jct	00 30	00 30	01 23	01 23	01 48	02 06	02 06	02 41	03 17	03 32	.	06 45	07 02	07 02	07 02	.
Teralba Colliery	.	.	.	.	**02 00**	.	.	.	.	**03 44**	.	.	.	.	.	.
Newstan Colliery	.	.	.	.		.	.	.	.		.	.	.	.	.	.
Newstan Colliery Jct	00 37	00 37	01 30	01 30	Not to	02 13	02 13	02 52	03 28	Will not	.	06 52	07 09	07 09	07 09	.
Newstan Colliery	.	.	.	.	run when	.	.	.	.	run when	.	.	.	.	.	.
Fassifern	00 38	00 38	01 31	01 31	TB405	02 14	02 14	02 53	03 29	TB401	.	06 53	07 10	07 10	07 10	.
Awaba	00 42	00 42	01 36	01 36	runs	02 19	02 19	02 59	03 35	runs	.	06 57	07 14	07 14	07 14	.
Eraring Colliery Jct	00 46	00 46	01 40	01 40	.	02 23	02 23	03 07	03 43	.	.	07 01	07 18	07 18	07 18	.
Eraring Colliery	.	.	.	.	.	.	.	**03 12**	**03 48**	.	.	.	.	.	.	.
Morisset	00 56	00 56	01 51	01 51	.	02 34	02 34			.	.	07 09	07 28	07 28	07 28	.
Vales Point Jctn	00 58	00 59	01 53	01 54	.	02 36	02 36	Not to	Not to	.	.	07 12	07 30	07 30	07 30	.
Vales Point Colliery	.	.	.	.	.	.	.	run when	run when	.	.	.	.	.	.	.
Wyee	01 03	01 03	01 59	01 59	.	02 42	02 42	ER472	ER470	.	.	07 15	07 35	07 35	07 35	.
								runs	runs							
Wyong	01 15	01 15	02 11	02 11	.	02 54	02 54	.	.	.	.	07 24	07 47	07 47	07 47	.
Gosford North	01 30	01 30	02 26	02 26	.	03 09	03 09	.	.	.	.	07 37	08 02	08 02	08 02	.
Gosford Up Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	01 31	01 31	02 27	02 27	.	03 10	03 10	.	.	.	.	07 40T	08 03	08 03	08 03	.
Woy Woy	01 39	01 39	02 35	02 35	.	03 18	03 18	.	.	.	.	07 51T	08 11	08 11	08 11	.
Hawkesbury River	01 54	01 54	02 50	02 50	.	03 33	03 33	.	.	.	.	08 07T	08 26	08 26	08 26	.
Cowan	02 17	02 17	03 15	03 15	.	04 00T	04 00T	.	.	.	.	08 23	08 49	08 49	08 49	.
												R	**R**	**R**	**R**	
Cowan Extd Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	08 28	08 54	08 54	08 54	.
dep	.	.	.	.	.	.	.	.	.	.	.	08 37x	09 09x	09 09x	09 09x	.
												XM	**XM**	**XM**	**XM**	
Berowra ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	02 24	02 24	03 22	03 22	.	04 09T	04 09T	.	.	.	.	08 43	09 16	09 16	09 16	.
Hornsby	02 34	02 34	03 33	03 33	.	04 22T	04 22T	.	.	.	.	08 54T	09 26	09 26	09 26	.
Thornleigh	02 38	02 38	03 37	03 37	.	04 26	04 26	.	.	.	.	09 02T	09 30	09 30	09 30	.
		M		**M**												
Epping	02 45	02 45	03 44	03 44	.	04 33	04 33	.	.	.	.	09 17T	09 37	09 37	09 37	.
	S	**S**	**S**	**S**		**S**	**S**									
West Ryde ..... arr	.	.	.	.	.	.	.	.	.	.	.	09 26T	.	.	.	.
dep	02 50	02 50	03 49	03 49	.	04 38	04 38	.	.	.	.	09 35x	09 43	09 43	09 43	.
Rhodes	02 53	02 53	03 52	03 52	.	04 41	04 41	.	.	.	.	09 40	09 46	09 46	09 46	.
	XR	**XR**	**XR**	**XR**		**XR**	**XR**					**XR**	**XR**	**XR**	**XR**	
Concord West	02 55	02 55	03 54	03 54	.	04 44	04 43	.	.	.	.	09 43	09 49	09 49	09 49	.
Nth Strathfield Jctn ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	02 58	02 58	03 57	03 57	.	04 47	04 46	.	.	.	.	09 46	09 52	09 52	09 52	.
Homebush Loop	03 00	03 00	03 59	03 59	.	04 49	04 48	.	.	.	.	09 48	09 54	09 54	09 54	.
	DG	**DG**	**DG**	**DG**		**DG**	**DG**					**DG**	**DG**	**DG**	**DG**	
Flemington Markets ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	03 03	03 03	04 02	04 02	.	04 52	04 53T	.	.	.	.	09 51	09 57	09 57	09 57	.
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	03 09	03 09	04 08	04 08	.	04 58	05 01T	.	.	.	.	09 57	10 03	10 03	10 03	.
Flemington Gds South	03 14	.	04 13	04 13	.	05 03	05 07T	.	.	.	.	10 02	10 09	10 09	10 09	.
Chullora Jctns	03 17	.	04 16	04 16	.	05 06	05 11T	.	.	.	.	10 06	10 12T	10 12T	10 12T	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	**10 09**	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	**10 17**	**10 17**	**10 17**	.
Enfield ..... **arr**	**03 24**	.	**04 23**	.	.	**05 13**	.	.	.	.	.	.				.
dep		.		04 21	.		05 16	.	.	.	.	.	.	.	.	.
Forms or Destination		Clyde Up Yards		Botany			Botany				07 12 Up	014B Melbourne	11 25	11 25		

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:14).

SECTION 3	5NY3	6NY3	010N	ER476	020B	020B	3BA6	4BS6	5BS6	014N	026B	2BM4	3BM4	4BM4	5BM4
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	900	900	850	760	1500	1500	1500	1200	1500	600	1500	1500	1500	1500	1500
COMMODITY	Steel	Steel	Spare	Coal	Spare	Spare	General	General	General	Spare	Spare	General	General	General	General
OPERATOR	PNIN	PNIN	RailCorp	PNC	RailCorp	RailCorp	PNIN	PNIN	PNIN	RailCorp	RailCorp	PNIN	PNIN	PNIN	PNIN
SCHEDULE	C1	C1	C2	8CL	A1	A1	A1	A1	A1	C2	A1	A1	A1	A1	A1
PATH TYPE	T	T	S	F	S	S	T	T	T	S	S	T	T	T	T
	ThO	FO	Tu.W.Th		MO	TuO	WO	ThO	FO		MO	TuO	WO	ThO	FO
Islington Junction arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	06 40	06 40	.	07 00	08 44	08 44	08 44	08 44	08 44	.	09 30	09 30	09 30	09 30	09 30
	R	**R**									**R**	**R**	**R**	**R**	**R**
Woodville Junction	06 43T	06 43T	.	07 02	08 46	08 46	08 46	08 46	08 46	.	09 33T	09 33T	09 33T	09 33T	09 33T
Broadmeadow	06 48T	06 48T	.	07 06	08 50	08 50	08 50	08 50	08 50	.	09 37	09 37	09 37	09 37	09 37
Broadmeadow Yard arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	06 50	06 50	.	07 07	08 51	08 51	08 51	08 51	08 51	**08 55**	09 39	09 39	09 39	09 39	09 39
	XM	**XM**								**XM**	**XM**	**XM**	**XM**	**XM**	**XM**
Adamstown	06 51	06 51	From	07 09	08 53	08 53	08 53	08 53	08 53	08 59	09 40	09 40	09 40	09 40	09 40
Sulphide Junction	07 00	07 00	Broadmea-	07 24	09 01	09 01	09 01	09 01	09 01	09 09	09 48	09 48	09 48	09 48	09 48
			dow Yard												
Sulphide Jctn Yard arr	.	.	**R**	.	.	.	.	.	.	.	.	.	.	.	.
dep	07 00	07 00	07 12x	07 24	09 01	09 01	09 01	09 01	09 01	09 09	09 48	09 48	09 48	09 48	09 48
			XM												
Teralba Colliery Jct	07 02	07 02	07 17	07 27	09 03	09 03	09 03	09 03	09 03	09 11	09 50	09 50	09 50	09 50	09 50
Teralba Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	07 09	07 09	07 24	07 38	09 10	09 10	09 10	09 10	09 10	09 18	09 57	09 57	09 57	09 57	09 57
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fassifern	07 10	07 10	07 25	07 39	09 11	09 11	09 11	09 11	09 11	09 19	09 58	09 58	09 58	09 58	09 58
Awaba	07 14	07 14	07 30	07 45	09 15	09 15	09 15	09 15	09 15	09 24	10 02	10 02	10 02	10 02	10 02
Eraring Colliery Jct	07 18	07 18	07 34	07 53	09 19	09 19	09 19	09 19	09 19	09 28	10 06	10 06	10 06	10 06	10 06
Eraring Colliery	.	.	.	**07 58**	.	.	.	.	.	.	.	.	.	.	.
Morisset	07 28	07 28	07 45	—	09 27	09 27	09 27	09 27	09 27	09 39	10 14	10 14	10 14	10 14	10 14
Vales Point Jctn	07 30	07 30	07 47	.	09 30	09 30	09 30	09 30	09 30	09 41	10 16	10 16	10 16	10 16	10 16
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	07 35	07 35	07 53	.	09 33	09 33	09 33	09 33	09 33	09 47	10 20	10 20	10 20	10 20	10 20
Wyong	07 47	07 47	08 06T	.	09 42	09 42	09 42	09 42	09 42	09 59	10 31T	10 31T	10 31T	10 31T	10 31T
Gosford North	08 02	08 02	08 26T	.	09 55	09 55	09 55	09 55	09 55	10 14	10 46T	10 46T	10 46T	10 46T	10 46T
Gosford Up Refuge arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	08 03	08 03	08 28T	.	09 56	09 56	09 56	09 56	09 56	10 15	10 48T	10 48T	10 48T	10 48T	10 48T
Woy Woy	08 11	08 11	08 40T	.	10 04	10 04	10 04	10 04	10 04	10 23	10 56	10 56	10 56	10 56	10 56
Hawkesbury River	08 26	08 26	08 55	.	10 18	10 18	10 18	10 18	10 18	10 38	11 10	11 10	11 10	11 10	11 10
Cowan	08 49	08 49	09 21	.	10 34	10 34	10 34	10 34	10 34	11 03	11 27T	11 27T	11 27T	11 27T	11 27T
	R	**R**	**R**		**R**	**R**	**R**	**R**	**R**	**R**					
Cowan Extd Refuge arr	08 54	08 54	09 26	.	10 39	10 39	10 39	10 39	10 39	11 08	.	.	.	.	.
dep	09 09x	09 09x	10 23x	.	10 51x	10 51x	10 51x	10 51x	10 51x	11 21x	.	.	.	.	.
	XM	**XM**	**XM**		**XM**	**XM**	**XM**	**XM**	**XM**	**XM**					
Berowra arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 16	09 16	10 30	.	10 56	10 56	10 56	10 56	10 56	11 28	11 33T	11 33T	11 33T	11 33T	11 33T
Hornsby	09 26	09 26	10 41	.	11 08T	11 08T	11 07T	11 07T	11 07T	11 39T	11 43	11 43	11 43	11 43	11 43
Thornleigh	09 30	09 30	10 45	.	11 14T	11 14T	11 14T	11 14T	11 14T	11 44T	11 47	11 47	11 47	11 47	11 47
Epping	09 37	09 37	10 52	.	11 22	11 22	11 22	11 22	11 22	11 52T	11 55T	11 55T	11 55T	11 55T	11 55T
			S		**S**	**S**	**S**	**S**	**S**	**S**					
West Ryde arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 43	09 43	10 58T	.	11 27	11 27	11 27T	11 27T	11 27T	11 57T	12 01	12 01	12 01	12 01	12 01
Rhodes	09 46	09 46	11 01	.	11 30	11 30	11 30	11 30	11 30	12 00	12 06T	12 06T	12 06T	12 06T	12 06T
	XR	**XR**	**XR**		**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**
Concord West	09 49	09 49	11 04	.	11 32	11 32	11 33	11 33	11 33	12 03	12 11T	12 11T	12 11T	12 11T	12 11T
Nth Strathfield Jctn arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 53	09 53	11 07	.	11 36	11 36	11 36T	11 36T	11 36T	12 06	12 15T	12 15T	12 15T	12 15T	12 15T
Homebush Loop	09 55	09 55	11 09	.	11 38	11 38	11 38	11 38	11 38	12 08	12 17	12 17	12 17	12 17	12 17
	DG	**DG**	**DG**		**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**
Flemington Markets arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 58	09 58	11 12	.	11 41	11 41	11 41	11 41	11 41	12 11	12 20	12 20	12 20	12 20	12 20
Flemington Gds Jctns arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 04	10 04	11 18	.	11 47	11 47	11 47	11 47	11 47	12 17	12 26	12 26	12 26	12 26	12 26
Flemington Gds South	10 09	10 09	11 23	.	11 52	11 52	11 52	11 52	11 52	12 22	12 32	12 32	12 32	12 32	12 32
Chullora Jctns	10 13T	10 13T	11 26	.	11 55	11 55	11 56T	11 56T	11 56T	12 25	12 35	12 35T	12 35T	12 35T	12 35T
Chullora Jctn West arr	.	.	.	.	.	.	.	.	.	.	**12 38**	**12 38**	**12 38**	**12 38**	**12 38**
dep	.	.	.	.	.	.	.	.	.	.	.	—	—	—	—
Chullora SOY	**10 18**	**10 18**	.	.	.	.	**12 01**	**12 01**	**12 01**	.	.	.	.	.	.
Enfield arr	—	—	**11 33**	.	**12 02**	**12 02**	—	—	—	**12 32**	.	.	.	.	.
dep	.	.	—	.	—	—	.	.	.	—	.	.	.	.	.
Forms or Destination		11 25					18 45				026B Melbourne	12 44	12 44	12 44	12 44

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS

SECTION 3	2BM7	3BM7	4BM7	5BM7	018N	TB409	4112	TB413	TB417	026N	030N	2BW4	3BW4	4BW4	5BW4
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	1200	1200	1200	1200	635	1360	635	1360	1010	1000	1500	1200	1200	1200	1200
COMMODITY	General	General	General	General	Spare	Coal	General	Coal	Spare	Spare	Spare	Steel	Steel	Steel	Steel
OPERATOR	INTRL	INTRL	INTRL	INTRL	RailCorp	PNC	SSRS	PNC	RailCorp	RailCorp	RailCorp	PNIN	PNIN	PNIN	PNIN
SCHEDULE	A1	A1	A1	A1	C2	3CE	C2	3CE	3CE	C2	C1	C1	C1	C1	C1
PATH TYPE					S	T		T	S	S	S	T	T	T	T
	TuO	WO	ThO	FO	MO						MO	TuO	WO	ThO	FO
Islington Junction arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 43	09 43	09 43	09 43	.	09 48	10 51	12 41	14 29 R	.	.	16 43	16 43	16 43	16 43
Woodville Junction	09 45	09 45	09 45	09 45	.	09 50	10 53	12 45	14 32T	.	.	16 45	16 45	16 45	16 45
Broadmeadow	09 49	09 49	09 49	09 49	.	09 54	10 57	12 49	14 36	.	.	16 49	16 49	16 49	16 49
Broadmeadow Yard arr	.	.	.	.	.	.	.	.	14 38	.	.	.	.	.	.
dep	09 50	09 50	09 50	09 50	**09 50 XM**	09 56	10 58	12 50	14 49x **XM**	**15 58 XM**	**16 51 XM**	16 51T	16 51T	16 51T	16 51T
Adamstown	09 52	09 52	09 52	09 52	09 53	09 58	11 00	12 52	14 52	16 01	16 54	16 54T	16 54T	16 54T	16 54T
Sulphide Junction	10 00	10 00	10 00	10 00	10 03	10 10	11 10	13 03	15 03	16 11	17 03	17 03	17 03	17 03	17 03
Sulphide Jctn Yard arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 00	10 00	10 00	10 00	10 03	10 11	11 10	13 04T	15 03	16 11	17 03	17 03	17 03	17 03	17 03
Teralba Colliery Jct	10 02	10 02	10 02	10 02	10 05	10 16	11 12	13 08	15 08	16 13	17 05	17 05	17 05	17 05	17 05
Teralba Colliery	.	.	.	.	.	**10 28**	.	**13 22**	**15 20**	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	10 09	10 09	10 09	10 09	10 12	.	11 19	.	.	16 20	17 12	17 12	17 12	17 12	17 12
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fassifern	10 10	10 10	10 10	10 10	10 13	.	11 20	.	.	16 21	17 13	17 13	17 13	17 13	17 13T
Awaba	10 14	10 14	10 14	10 14	10 18	.	11 25	.	.	16 26	17 17	17 17	17 17	17 17	17 17
Eraring Colliery Jct	10 18	10 18	10 18	10 18	10 22	.	11 29	.	.	16 30	17 21	17 21	17 21	17 21	17 21
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Morisset	10 26	10 26	10 26	10 26	10 33	.	11 40	.	.	16 41	17 31	17 31	17 31	17 31	17 31
Vales Point Jctn	10 29	10 29	10 29	10 29	10 35	.	11 43	.	.	16 43	17 33	17 33	17 33	17 33	17 33
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	10 32	10 32	10 32	10 32	10 41	.	11 48	.	.	16 49	17 38	17 38	17 38	17 38	17 38
Wyong	10 41	10 41	10 41	10 41	10 53	.	12 00	.	.	17 01	17 50	17 50	17 50	17 50	17 50
Gosford North	10 54	10 54	10 54	10 54	11 09T	.	12 15	.	.	17 16	18 09T	18 09T	18 09T	18 09T	18 09T
Gosford Up Refuge arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 55	10 55	10 55	10 55	11 11T	.	12 16	.	.	17 17	18 11T	18 11T	18 11T	18 11T	18 11T
Woy Woy	11 03	11 03	11 03	11 03	11 23T	.	12 24	.	.	17 25	18 23T	18 23T	18 23T	18 23T	18 23T
Hawkesbury River	11 17	11 17	11 17	11 17	11 42T	.	12 39	.	.	17 40	18 38	18 38	18 38	18 38	18 38
Cowan	11 33 R	11 33 R	11 33 R	11 33 R	12 08 R	.	13 04 R	.	.	18 05 R	19 01 R	19 01 R	19 01 R	19 01 R	19 01 R
Cowan Extd Refuge arr	11 38	11 38	11 38	11 38	12 13	.	13 09	.	.	18 10	19 06	19 06	19 06	19 06	19 06
dep	11 52x **XM**	11 52x **XM**	11 52x **XM**	11 52x **XM**	12 21x **XM**	.	13 22x **XM**	.	.	18 23x **XM**	19 27x **XM**	19 27x **XM**	19 27x **XM**	19 27x **XM**	19 27x **XM**
Berowra arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	11 58	11 58	11 58	11 58	12 28	.	13 29	.	.	18 30	19 34	19 34	19 34	19 34	19 34
Hornsby	12 08	12 08	12 08	12 08	12 39	.	13 40	.	.	18 41	19 44	19 44T	19 44T	19 44T	19 44T
Thornleigh	12 14T	12 13T	12 13T	12 13T	12 44T	.	13 44	.	.	18 47T	19 48	19 48	19 48	19 48	19 48
Epping	12 22 S	12 22T S	12 22T S	12 22T S	12 52 S	.	13 52T S	.	.	18 57T S	19 57T S	19 57T S	19 57T S	19 57T S	19 57T S
West Ryde arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	12 27T	12 27	12 27T	12 27T	12 57T	.	13 57	.	.	19 05T	20 06T	20 06T	20 06T	20 06T	20 06T
Rhodes	12 30 XR	12 30 XR	12 30 XR	12 30 XR	13 00 XR	.	14 00 XR	.	.	19 11T XR	20 10T XR	20 10T XR	20 10T XR	20 10T XR	20 10T XR
Concord West	12 33	12 33	12 33	12 33	13 03	.	14 03	.	.	19 13	20 13	20 13	20 13	20 13	20 13
Nth Strathfield Jctn arr	.	.	.	.	13 08	.	.	.	.	.	.	.	.	.	.
dep	12 36	12 36	12 36	12 36	13 22x	.	14 06	.	.	19 16	20 17T	20 17T	20 17T	20 17T	20 17T
Homebush Loop	12 38 DG	12 38 DG	12 38 DG	12 38 DG	13 25 DG	.	14 08 DG	.	.	19 18 DG	20 19 DG	20 19 DG	20 19 DG	20 19 DG	20 19 DG
Flemington Markets arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	12 41	12 41	12 41	12 41	13 28	.	14 11	.	.	19 21	20 22	20 22	20 22	20 22	20 22
Flemington Gds Jctns arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	12 47	12 47	12 47	12 47	13 34	.	14 17	.	.	19 27	20 28	20 28	20 28	20 28	20 28
Flemington Gds South	12 52	12 52	12 52	12 52	13 39	.	14 22	.	.	19 33	20 33	20 33	20 33	20 33	20 33
Chullora Jctns	12 56	12 56	12 56	12 56	13 42	.	14 25	.	.	19 35	20 36	20 36	20 36	20 36	20 36
Chullora Jctn West arr	12 59	12 59	12 59	12 59	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enfield arr	.	.	.	.	**13 49**	.	.	.	.	**19 41**	**20 43**	**20 43**	**20 43**	**20 43**	**20 43**
dep	.	.	.	.		.	14 30	.	.						
Forms or Destination	2BM7 Melbourne	3BM7 Melbourne	4BM7 Melbourne	5BM7 Melbourne			Botany					21 46	21 46	21 46	21 46

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:15).

SECTION 3	4124	TB419	JW62	NW435	TB421	032B	3BM2	034B	032B	032B	034N	036B	5182	5182	036N	
Consist																
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	
LENGTH (M)	400	1010	850	800	1360	1500	1500	1500	1500	1500	550	1500	600	650	1000	
COMMODITY	General	Spare	Coal	Coal	Coal	Spare	General	Spare	Spare	Spare	Spare	Spare	General	General	Spare	
OPERATOR	PNRB	RailCorp	PNC	PNC	PNC	RailCorp	PNIN	RailCorp	RailCorp	RailCorp	RailCorp	RailCorp	FLA	FLA	RailCorp	
SCHEDULE	B1	3CE	2CL	5CE	3CE	A1	A1	A1	A1	A1	C1	A1	C2	C1	C1	
PATH TYPE	T	S	T	F	T	S	T	S	S	S	S	S			S	
						MO	TuO	WO	ThO	FO		WO	TuO	WO	M.Th	
Islington Junction arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	17 01	17 22	17 41	18 18	19 09	19 59	19 59	19 59	19 59	19 59	.	21 08	21 02	20 38	.	.
		R	R			R	R	R	R	R			R	R		
Woodville Junction	17 03	17 25T	17 44T	18 20	19 11	20 02T	20 02T	20 02T	20 02T	20 02T	.	21 10	21 05T	20 41T	.	.
Broadmeadow	17 07	17 29	17 48	18 24	19 15	20 06	20 06	20 06	20 06	20 06	.	21 14	21 09	20 45	.	.
		UTR														
Broadmeadow Yard arr	.	17 31	17 52	.	.	20 10	20 10	20 10	20 10	20 10	.	.	21 12	**20 48**	.	.
dep	17 08	17 33T	17 56L	18 25	19 16	20 28	20 28	20 28	20 28	20 28	**20 33**	21 15	21 18x	**21 18**	**21 22**	.
		XM	XM			XM	XM	XM	XM	XM	XM		XM	XM	XM	
Adamstown	17 10	17 36	17 59	18 27	19 18	20 31	20 31	20 31	20 31	20 31	20 38	21 17	21 21	21 21T	21 25	.
Sulphide Junction	17 19	17 47	18 09	18 38	19 29	20 39	20 39	20 39	20 39	20 39	20 47	21 25	21 31	21 31	21 34	.
Sulphide Jctn Yard arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	17 19	17 47	18 09	18 39	19 29	20 39	20 39	20 39	20 39	20 39	20 47	21 25	21 31	21 31	21 34	.
				XM												
Teralba Colliery Jct	17 21	17 52	18 12	18 42	19 34	20 41	20 41	20 41	20 41	20 41	20 49	21 27	21 33	21 33	21 36	.
Teralba Colliery	.	18 04	.	.	19 46	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	17 28	.	18 19	18 49	.	20 48	20 48	20 48	20 48	20 48	20 56	21 34	21 40	21 40	21 43	.
Newstan Colliery	.	.	.	18 55	.	.	.	.	.	.	.	.	.	.	.	.
Fassifern	17 29	.	18 20	.	.	20 49	20 49	20 49	20 49	20 49	20 57	21 35	21 41T	21 41	21 44	.
Awaba	17 33	.	18 25	.	.	20 53	20 53	20 53	20 53	20 53	21 01	21 39	21 46	21 46	21 48	.
Eraring Colliery Jct	17 37	.	18 30	.	.	20 57	20 57	20 57	20 57	20 57	21 05	21 43	21 50	21 50	21 52	.
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Morisset	17 47	.	18 40	.	.	21 05	21 05	21 05	21 05	21 05	21 15	21 51	22 01	22 01T	22 02	.
Vales Point Jctn	17 50	.	18 44	.	.	21 07	21 07	21 07	21 07	21 07	21 17	21 54	22 03	22 03	22 04	.
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	17 54	.	18 48	.	.	21 11	21 11	21 11	21 11	21 11	21 22	21 57	22 09	22 09T	22 09	.
Wyong	18 03	.	19 00	.	.	21 20	21 20	21 20	21 20	21 20	21 34	22 06	22 21	22 21	22 21	.
Gosford North	18 20T	.	19 15	.	.	21 33	21 33	21 33	21 33	21 33	21 49	22 19	22 36	22 36	22 36	.
	R															
Gosford Up Refuge arr	18 22T	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	18 46x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	UM															
Gosford arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	18 49	.	19 16	.	.	21 34	21 34	21 34	21 34	21 34	21 50	22 20	22 37	22 37	22 37	.
Woy Woy	18 57	.	19 25	.	.	21 42	21 42	21 42	21 42	21 42	21 58	22 28	22 45	22 45	22 45	.
Hawkesbury River	19 12	.	19 40	.	.	21 56	21 56	21 56	21 56	21 56	22 13	22 42	23 00	23 00	23 00	.
Cowan	19 38T	.	20 05	.	.	22 12	22 12	22 12	22 12	22 12	22 36	22 58	23 25	23 25T	23 23	.
			R								R					
Cowan Extd Refuge arr	.	.	20 11	.	.	.	.	.	.	.	22 41	.	.	.	.	.
dep	.	.	20 24x	.	.	.	.	.	.	.	22 52x	.	.	.	.	.
			XM								XM					
Berowra arr	.	.	.	.	.	.	.	.	.	.	.	.	23 32	23 32	.	.
dep	19 45T	.	20 31	.	.	22 17	22 17	22 17	22 17	22 17	22 59	23 03	.	.	23 30	.
Hornsby	19 56	.	20 42	.	.	22 27	22 27	22 27	22 27	22 27	23 09	23 13	.	.	23 40	.
Thornleigh	20 00	.	20 46	.	.	22 31	22 31	22 31	22 31	22 31	23 13	23 17	.	.	23 44	.
	M											M				
Epping	20 07	.	20 54	.	.	22 38	22 38	22 38	22 38	22 38	23 20	23 24	.	.	23 51	.
						S	S	S	S	S	S	S			S	
West Ryde arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	20 13	.	21 00	.	.	22 43	22 43	22 43	22 43	22 43	23 25	23 31T	.	.	23 56	.
Rhodes	20 16	.	21 03	.	.	22 46	22 46	22 46	22 46	22 46	23 28	23 37T	.	.	23 59	.
	XR		XR			XR	XR	XR	XR	XR	XR	XR			XR	
Concord West	20 19	.	21 06	.	.	22 48	22 48	22 48	22 48	22 49	23 32	23 41	.	.	00 01	.
Nth Strathfield Jctn arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	20 23T	.	21 09	.	.	22 51	22 51	22 51	22 51	22 52	23 35	23 45	.	.	00 04	.
Homebush Loop	20 25	.	21 11	.	.	22 53	22 53	22 53	22 53	22 54	23 37	23 47	.	.	00 06	.
	DG		DG			DG	DG	DG	DG	DG	DG	DG			DG	
Flemington Markets arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	20 28	.	21 14	.	.	22 57T	22 56	22 56	22 56	22 57	23 40	23 50	.	.	00 09	.
Flemington Gds Jctns arr	20 35	.	.	.	.	.	.	.	.	.	.	23 57	.	.	.	.
dep	20 43x	.	21 20	.	.	23 04T	23 02	23 02	23 02	23 03	23 46	00 04x	.	.	00 15	.
Flemington Gds South	.	.	21 25	.	.	23 09	23 07	23 07	23 07	23 08	23 51	00 11	.	.	00 20	.
Chullora Jctns	.	.	21 28	.	.	23 13T	23 11T	23 11T	23 10	23 11	23 54	00 14	.	.	00 23	.
Chullora Jctn West arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	**23 18**	**23 16**	**23 16**	.	.	.	.	.	.	.	.
Enfield arr	.	.	**21 35**	.	.	—	—	—	**23 17**	**23 18**	**00 01**	**00 21**	.	.	**00 29**	.
dep	.	.	—	.	.	.	.	.	—	—	—	—	.	.	—	.
	Clyde Up Yards		22 41			01 38 TuO	01 34 WO		01 31 FO	00 56 SatO		01 31 ThO	23 32 Up	23 32 Up		

Forms or Destination

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:16).

SECTION 3	5182	5182	040N	NW437	JW74	JW74	JW74	JW74	JW74	4144	4144	TB427	046N	D420	5BM2	
Consist																
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Loco	Fght	
LENGTH (M)	600	650	1000	800	850	850	850	850	850	550	550	1360	1000	50	1500	
COMMODITY	General	General	Spare	Coal	Coal	Coal	Coal	Coal	Coal	General	General	Coal	Spare	Loco	General	
OPERATOR	FLA	FLA	RailCorp	PNC	PNC	PNC	PNC	PNC	PNC	SSRS	SSRS	PNC	RailCorp	PNC	PNIN	
SCHEDULE	C2	C1	A1	5CE	2CL	2CL	2CL	2CL	2CL	C2	C2	3CE	C2	LE	A1	
PATH TYPE			S	F	T	T	T	T	T			T	S	T	T	
	TuO	WO	MO		MO	TuO	WO	ThO	FO	M to Th	FO			FO	ThO	
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	21 38	21 25	21 25	21 25	21 25	21 25	22 05	22 05	22 47	.	23 31	23 59	.
					R	R	R	R	R	R	R	R				
Woodville Junction	.	.	.	21 40	21 27	21 27	21 27	21 27	21 27	22 07	22 07	22 49	.	23 33	00 01	.
Broadmeadow	.	.	.	21 44	21 31	21 31	21 31	21 31	21 31	22 11	22 11	22 53	.	23 36	00 05	.
										UYD	UYD					
Broadmeadow Yard ..... **arr**	.	.	.	.	**21 34**	**21 34**	**21 34**	**21 34**	**21 34**	**22 14L**	**22 14L**	.	.	.	.	.
dep	.	.	**21 38**	21 45	**22 01L**	**22 01L**	**22 01L**	**22 01L**	**22 01L**	**22 19**	**22 19**	22 56	**23 16**	23 37	00 06	.
			XM		**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**			
Adamstown	.	.	21 43	21 47	22 05	22 05	22 05	22 05	22 05	22 22	22 22	22 57	23 21	23 39	00 08	.
Sulphide Junction	.	.	21 51	21 58	22 15	22 15	22 15	22 15	22 15	22 32	22 32	23 08	23 31	23 48	00 16	.
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	21 51	21 58	22 15	22 15	22 15	22 15	22 15	22 32	22 32	23 08	23 31	23 48	00 16	.
Teralba Colliery Jct	.	.	21 53	22 01	22 18	22 18	22 18	22 18	22 18	22 34	22 34	23 13	23 33	23 50	00 18	.
Teralba Colliery	.	.	.	.	.	.	.	.	.	.	.	**23 25**	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	.	.	22 00	22 07	22 25	22 25	22 25	22 25	22 25	22 41	22 41	.	23 40	24 00	00 25	.
Newstan Colliery	.	.	.	**22 13**	.	.	.	.	.	.	.	.	.	.	.	.
Fassifern	.	.	22 01		22 26	22 26	22 26	22 26	22 26	22 42	22 42	.	23 41	00 01	00 26	.
Awaba	.	.	22 05	.	22 31	22 31	22 31	22 31	22 31	22 47	22 47	.	23 46	00 07	00 30	.
Eraring Colliery Jct	.	.	22 09	.	22 36	22 36	22 36	22 36	22 36	22 51	22 51	.	23 50	00 12	00 34	.
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Morisset	.	.	22 17	.	22 46	22 46	22 46	22 46	22 46	23 02	23 02	.	00 01	00 23	00 42	.
Vales Point Jctn	.	.	22 19	.	22 50	22 50	22 50	22 50	22 50	23 04	23 04	.	00 03	00 27	00 45	.
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	.	.	22 23	.	22 54	22 54	22 54	22 54	22 54	23 10	23 10	.	00 09	00 33	00 48	.
Wyong	.	.	22 35T	.	23 06	23 06	23 06	23 06	23 06	23 22	23 22	.	00 21	00 50	00 57	.
Gosford North	.	.	22 48	.	23 21	23 21	23 21	23 21	23 21	23 37	23 37	.	00 36	01 13	01 10	.
Gosford Up Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	22 49	.	23 22	23 22	23 22	23 22	23 22	23 38	23 38	.	00 37	01 15	01 11	.
Woy Woy	.	.	22 57	.	23 31	23 31	23 31	23 31	23 31	23 46	23 46	.	00 45	01 25	01 19	.
Hawkesbury River	.	.	23 11	.	23 46	23 46	23 46	23 46	23 46	00 01	00 01	.	01 00	01 43	01 33	.
Cowan	.	.	23 32T	.	00 11	00 11	00 11	00 11	00 11	00 26	00 26	.	01 25	01 59	01 49	.
Cowan Extd Refuge ..... arr	From	From	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	Islington	Islington	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Junction	Junction														
Berowra ..... arr	**UM**	**UM**	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	23 32	23 32	23 37T	.	00 18	00 18	00 18	00 18	00 18	00 33	00 33	.	01 32	02 04	01 54	.
Hornsby	23 43	23 43	23 54T	.	00 29	00 29	00 29	00 29	00 29	00 44	00 44	.	01 43	02 15	02 04	.
Thornleigh	23 47	23 47	23 59T	.	00 33	00 33	00 33	00 33	00 33	00 48	00 48	.	01 47	02 20	02 08	.
	M	**M**												**M**	**M**	
Epping	23 54	23 54	00 08T	.	00 41	00 41	00 41	00 41	00 41	00 55	00 55	.	01 54T	02 27	02 15	.
	S	**S**								**S**	**S**		**S**	**S**	**S**	
West Ryde ..... arr	.	.	00 16	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	23 59	24 00	00 27x	.	00 48	00 48	00 48	00 48	00 48	01 00	01 00	.	02 02T	02 32	02 20	.
Rhodes	00 02	00 03	00 33T	.	00 51	00 51	00 51	00 51	00 51	01 03	01 03	.	02 07T	02 35	02 23	.
	XR	**XR**	**XR**		**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**		**XR**	**XR**	**XR**	
Concord West	00 04	00 05	00 36	.	00 53	00 53	00 53	00 53	00 53	01 05	01 05	.	02 13T	02 38	02 25	.
Nth Strathfield Jctn ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	00 07	00 08	00 39	.	00 56	00 56	00 56	00 56	00 56	01 08	01 08	.	02 16	02 41	02 28	.
Homebush Loop	00 09	00 10	00 41	.	00 58	00 58	00 58	00 58	00 58	01 10	01 10	.	02 18	02 42	02 30	.
	DG	**DG**	**DG**		**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**		**DG**	**DG**	**DG**	
Flemington Markets ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	00 12	00 13	00 44	.	01 01	01 01	01 01	01 01	01 01	01 13	01 13	.	02 21	02 45	02 33	.
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	00 18	00 19	00 50	.	01 07	01 07	01 07	01 07	01 07	01 19	01 19	.	02 27	02 51	02 39	.
Flemington Gds South	00 23	00 24	00 55	.	01 13	01 13	01 13	01 13	01 13	01 24	01 24	.	02 33T	02 54	02 44	.
Chullora Jctns	00 26	00 27	00 58	.	01 15	01 15	01 15	01 15	01 15	01 27	01 27	.	02 37T	02 57	02 48T	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**02 53**	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enfield ..... **arr**	.	.	**01 04**	.	**01 21**	**01 21**	**01 21**	**01 21**	**01 21**	.	.	.	**02 44**	.	.	.
dep	00 31	00 32		.						01 32	01 32	.		.	.	.
Forms or Destination	Botany	Botany			01 21 TuO	01 21 WO	01 21 ThO	01 21 FO	01 36 SatO	Botany	Botany			Delec	5BM2 Melbourne	

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:17).

SECTION 3	TB428	TB428	NW438	001N	4441	003N	TB402	007N	011N	015N	ER471	9537	017N	9537	ER473	
Consist																
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	
LENGTH (M)	1360	1360	800	1200	350	1000	1360	1000	1000	1000	760	850	1000	850	760	
COMMODITY	Coal	Spare	Coal	Spare	General	Spare	Spare	Spare	Spare	Spare	Coal	Grain	Spare	Grain	Coal	
OPERATOR	PNC	RailCorp	PNC	RailCorp	SSRS	RailCorp	RailCorp	RailCorp	RailCorp	RailCorp	PNC	PNRB	RailCorp	PNRB	PNC	
SCHEDULE	8GL	8GL	6CL	C1	C1	C2	8GL	C2	C2	C1	5CE	C	A1	C	5CE	
PATH TYPE	T	S	F	S		S	S	S	S	S	T	T	S	T	F	
	Tu to F	MO	Tu to F	MO	MO							MO	MO	ThO		
Enfield ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	**00 12**	.	**00 39**	.	**01 08**	**01 41**	**02 03**	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctns	.	.	.	00 19	.	00 46	.	01 15	01 48	02 10	.	.	.	.	.	.
Flemington Gds South	.	.	.	00 24	.	00 51	.	01 20	01 53	02 15	.	.	.	From	.	.
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	Bomaderry	.	.
dep	.	.	.	00 28	.	00 54	.	01 23	01 56	02 18	.	.	.	(Nowra)	.	.
												UG	**UG**	**UG**		
Flemington Markets ..... **arr**	.	.	.	.	.	.	.	.	.	02 25	.	.	.	.	.	.
dep	.	.	.	00 34	.	01 00	.	01 29	02 02	02 35x	.	**03 07x**	**03 25**	03 19	.	.
Homebush Loop	.	.	.	00 37	.	01 04	.	01 33	02 06	02 40	.	03 13	03 29	03 25	.	.
				XNM		**XNM**		**R**	**XNM**	**R**		**R**	**XNM**	**R**		
Nth Strathfield Jctn	.	.	.	00 39	.	01 05	.	01 34	02 07	02 42	.	03 14	03 31	03 26	.	.
Concord West	.	.	.	00 42	.	01 08	.	01 37	02 10	02 45	.	03 17	03 34	03 29	.	.
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	00 44	.	01 10	.	01 39	02 12	02 47	.	03 19	03 36	03 31	.	.
								XDM		**XDM**		**XDM**		**XDM**		
West Ryde	.	.	.	00 46	.	01 12	.	01 41	02 14	02 49	.	03 21	03 38	03 33	.	.
				S		**S**		**S**	**S**	**S**		**S**	**S**	**S**		
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	00 51	.	01 19	.	01 48	02 21	02 54	.	03 23	03 41	03 36	.	.
Epping	.	.	.	00 54	.	01 21	.	01 50	02 23	02 57	.	03 26	03 44	03 38	.	.
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	.	.	.	01 06	.	01 34	.	02 03	02 36	03 09	.	03 33	03 53	03 45	.	.
Hornsby	.	.	.	01 11	.	01 39	.	02 08	02 41	03 14	.	03 37	03 57	03 49	.	.
Hornsby C.S. Jctn	.	.	.	01 13	.	01 42	.	02 11	02 44	03 16	.	03 38	03 58	03 50	.	.
Hornsby 2 Down T/B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asquith	.	.	.	**...**	.	**...**	.	**...**	**...**	**...**	.	**...**	**...**	**...**	.	.
Berowra	.	.	.	01 21	.	01 51	.	02 20	02 53	03 24	.	03 46	04 06	03 58	.	.
Cowan	.	.	.	01 25	.	01 55	.	02 24	02 57	03 28	.	03 50	04 10	04 02	.	.
Hawkesbury River	.	.	.	01 35	.	02 05	.	02 34	03 07	03 38	.	04 00	04 20	04 12	.	.
Woy Woy	.	.	.	01 50	.	02 20	.	02 49	03 22	03 53	.	04 14	04 34	04 27	.	.
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	01 57	.	02 27	.	02 56	03 29	04 00	.	04 21	04 41	04 34	.	.
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	.	.	.	01 58	.	02 28	.	02 57	03 30	04 01	.	04 22	04 42	04 35	.	.
Wyong	.	.	.	02 13	.	02 44	.	03 13	03 46	04 16	.	04 37	04 55	04 51T	.	.
Wyee	.	.	.	02 25	.	02 56	.	03 25	03 58	04 28	Not to	04 48	05 04	05 04T	Not to	.
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	run when	.	.	.	run when	.
Vales Point Jctn	.	.	.	02 30	.	03 01	.	03 30	04 03	04 33	ER473	04 51	05 07	05 06	ER471	.
Morisset	.	.	.	02 33	.	03 04	.	03 33	04 06	04 36	runs	04 55	05 10	05 11	runs	.
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	**04 46**	.	.	.	**05 24**	.
Eraring Colliery Jct	.	.	.	02 43	.	03 15	.	03 44	04 17	04 46	04 51	05 03	05 19	05 19	05 30	.
Awaba	.	.	.	02 48	.	03 20	.	03 49	04 22	04 51	04 55	05 08	05 23	05 23	05 36	.
Fassifern	.	.	.	02 52	.	03 25	.	03 54	04 27	04 55	04 59	05 12	05 27	05 27	05 40	.
Newstan Colliery	.	.	**01 15**	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	.	.	01 25	02 52	.	03 26	.	03 55	04 28	04 55	05 00	05 12	05 27	05 27	05 41	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	**00 50**	**01 20**	.	.	.	.	**03 29**	.	.	.	.	.	.	.	.	.
Teralba Colliery Jct	01 00	01 30	01 37	02 59	.	03 32	03 39	04 01	04 34	05 02	05 06	05 18	05 34	05 34	05 47	.
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	01 04	01 34	01 39	03 01	.	03 36	03 43	04 05	04 38	05 04	05 09	05 21	05 36	05 37	05 50	.
Sulphide Junction	01 07	01 37	01 40	03 01	.	03 36	03 46	04 05	04 38	05 04	05 09	05 22	05 37	05 37	05 50	.
Adamstown	01 26	01 56	01 51	03 11	.	03 46	04 05	04 15	04 48	05 14	05 19	05 32	05 47	05 47	06 02T	.
			R	**DYD**		**DYD**		**DYD**	**DYD**	**DYD**	**TR**	**R**	**TR**			
Broadmeadow Yard ..... **arr**	.	.	.	**03 16**	.	**03 51**	.	**04 20**	**04 53**	**05 19**	05 24	05 36	**05 52**	.	.	.
dep	01 30	02 00	01 52		**03 32**		04 09				05 35x	05 40T		05 48	06 06T	.
					R						**R**					
Broadmeadow	01 31	02 01	01 54	.	03 34	.	04 10	.	.	.	05 38	05 44	.	05 50	06 11T	.
Woodville Junction	01 35	02 05	01 58	.	03 38	.	04 14	.	.	.	05 42	05 48	.	05 54	06 15	.
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	06 18	.
dep	01 37	02 07	02 00	.	03 40	.	04 16	.	.	.	05 44	05 50	.	05 56	06 26x	.
Forms or Destination	Kooragang Coal Ldr	Kooragang Coal Ldr	Kooragang Coal Ldr		Bullock Island		Kooragang Coal Ldr				Kooragang Coal Ldr	Gunnedah		Gunnedah	Kooragang Coal Ldr	

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:09).

SECTION 3	TB406	JW61	023N	3MB2	4MB2	027N	2MB7	3MB7	4MB7	5MB7	ER477	2MB4	3MB4	4MB4	5MB4
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	1360	850	1000	1500	1500	1100	1200	1200	1200	1200	760	1500	1500	1500	1500
COMMODITY	Coal	Coal	Spare	General	General	Spare	General	General	General	General	Coal	General	General	General	General
OPERATOR	PNC	PNC	RailCorp	PNIN	PNIN	RailCorp	INTRL	INTRL	INTRL	INTRL	PNC	PNIN	PNIN	PNIN	PNIN
SCHEDULE	8GL	1CE	A1	A1	A1	A1	A1	A1	A1	A1	5CE	A1	A1	A1	A1
PATH TYPE	T	T	S	T	T	S					F	T	T	T	T
			M.Tu.F	WO	ThO	MO	TuO	WO	ThO	FO		TuO	WO	ThO	FO
Enfield ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	**03 44**	**04 47**	.	.	**09 07**	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	**04 48**	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	**04 07**	.	.	.	.	.	.	**09 39**	**09 39**	**09 39**	**09 39L**
Chullora Jctns	.	03 51	04 54	04 55	04 08	09 14	.	.	.	.	.	09 40	09 40	09 40	09 40
Flemington Gds South	.	03 56	04 59	05 00	04 13	09 19	.	.	.	.	.	09 45	09 45	09 45	09 45
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	From Macarthur	.	From Macarthur	From Macarthur	.	.	.	.	.
dep	.	03 59	05 02	05 03	04 16	09 23	**UG**	**UG**	**UG**	**UG**	.	09 48	09 48	09 48	09 48
Flemington Markets ..... **arr**	.	.	.	.	04 22	.	.	.	.	.	.	09 55	09 55	09 55	09 56
dep	.	04 05	05 08	05 09	05 07T	09 29	09 23	09 23	09 23	09 23	.	10 34x	10 34x	10 34x	10 34x
Homebush Loop	.	04 09	05 12	05 13	05 12	09 32	09 26	09 26	09 26	09 26	.	10 40	10 40	10 40	10 40
		XNM	**XNM**	**XNM**	**XNM**	**R**	**R**	**R**	**R**	**R**		**R**	**R**	**R**	**R**
Nth Strathfield Jctn	.	04 10	05 13	05 14	05 14	09 34	09 31T	09 31T	09 31T	09 30T	.	10 42	10 42	10 42	10 42
Concord West	.	04 13	05 16	05 17	05 17	09 37	09 34	09 34	09 34	09 33	.	10 45	10 45	10 45	10 45
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	04 16	05 18	05 19	05 19	09 39	09 36	09 36	09 36	09 35	.	10 47	10 47	10 47	10 47
						XDM	**XDM**	**XDM**	**XDM**	**XDM**		**XDM**	**XDM**	**XDM**	**XDM**
West Ryde	.	04 18	05 20	05 21	05 21	09 41	09 39T	09 40T	09 39T	09 37	.	10 50T	10 50T	10 50T	10 50T
		S	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**		**S**	**S**	**S**	**S**
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	04 23	05 24	05 25	05 24	09 44	09 45T	09 45T	09 45T	09 40	.	10 53	10 53	10 53	10 53
Epping	.	04 25	05 26	05 27	05 27	09 49T	09 49T	09 48	09 49T	09 43	.	10 56	10 56	10 56	10 56
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	.	04 37	05 35	05 36	05 36	10 00T	09 59T	09 58T	09 59T	09 52	.	11 05	11 05	11 05	11 05
			R	**R**	**R**	**R**	**R**	**R**	**R**	**R**		**R**	**R**	**R**	**R**
Hornsby	.	04 42	05 40	05 41	05 40	10 05T	10 03	10 03	10 03	09 57	.	11 10T	11 10T	11 10T	11 10T
						DM	**DM**	**DM**	**DM**	**DM**					
Hornsby C.S. Jctn	.	04 44	05 41	05 42	05 41	10 07	10 05	10 04	10 05	09 58	.	11 11	11 11	11 11	11 11
Hornsby 2 Down T/B	.	.	05 41	05 42	05 41	.	.	.	.	.	.	11 11	11 11	11 11	11 11
Asquith	.	**...**	**DM** **...** **R**	**DM** **...** **R**	**DM** **...** **R**	**...** **R**	**...** **R**	**...** **R**	**...** **R**	**...** **R**	.	**DM** **...**	**DM** **...**	**DM** **...**	**DM** **...**
Berowra	.	04 52	05 49	05 50	05 49	10 15	10 13	10 12	10 13	10 07T	.	11 22T	11 22T	11 22T	11 22T
			XM	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**					
Cowan	.	04 56	05 54	05 54	05 54	10 19	10 17	10 16	10 17	10 11	.	11 26	11 26	11 26	11 26
Hawkesbury River	.	05 06	06 04	06 04	06 04T	10 29	10 27	10 26	10 27	10 21	.	11 36	11 36	11 36	11 36
Woy Woy	.	05 22	06 18	06 18	06 18	10 43	10 41	10 40	10 41	10 35	.	11 50	11 50	11 50	11 50
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	05 29	06 26	06 26T	06 26T	10 50	10 48	10 47	10 48	10 42	.	11 57	11 57	11 57	11 57
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	.	05 30	06 27	06 27	06 27	10 51	10 49	10 48	10 49	10 43	.	11 58	11 58	11 58	11 58
Wyong	.	05 45	06 41T	06 42T	06 42T	11 04	11 02	11 01	11 02	11 01T	.	12 11	12 11	12 11	12 11
Wyee	.	05 57	06 52T	06 53T	06 53T	11 15T	11 13T	11 13T	11 13T	11 13T	.	12 20	12 20	12 20	12 20
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	.	06 01	06 55	06 55	06 55	11 20T	11 17T	11 17T	11 17T	11 17T	.	12 22	12 22	12 22	12 22
Morisset	.	06 05	06 58	06 59	06 59	11 24T	11 22T	11 22T	11 22T	11 22T	.	12 26	12 26	12 26	12 26
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	**11 34**	.	.	.	.
Eraring Colliery Jct	.	06 16	07 07	07 07	07 07	11 33	11 30	11 30	11 30	11 30	11 39	12 34	12 34	12 34	12 34
Awaba	.	06 21	07 12T	07 13T	07 13T	11 38T	11 36T	11 36T	11 36T	11 36T	11 43	12 39	12 39	12 39	12 39
Fassifern	.	06 25	07 18T	07 19T	07 19T	11 43T	11 41T	11 41T	11 41T	11 41T	11 47	12 44T	12 44T	12 44T	12 44T
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	.	06 26	07 19	07 19	07 19	11 43	11 41	11 41	11 41	11 41	11 48	12 44	12 44	12 44	12 44
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	**05 45**	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery Jct	05 55	06 32	07 25	07 25	07 25	11 51T	11 48T	11 48T	11 48T	11 48T	11 54	12 50	12 50	12 50	12 50
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	05 59	06 35	07 28	07 28	07 28	11 54	11 52	11 52	11 52	11 52	11 59	12 54	12 54	12 54	12 54
Sulphide Junction	06 02	06 35	07 28	07 29	07 29	11 55	11 53	11 53	11 53	11 52	11 59	12 54	12 54	12 54	12 54
Adamstown	06 21	06 45	07 38T	07 39	07 39	12 05	12 03	12 03	12 03	12 03	12 15T	13 06	13 06	13 06	13 06
		R	**TR**			**DYD**					**TR**				
Broadmeadow Yard ..... **arr**	.	**06 49L**	**07 43**	.	.	**12 10**	.	.	.	.	.	.	.	.	.
dep	06 25	**06 56x**	—	07 40	07 40	—	12 04	12 04	12 04	12 04	12 16	13 07	13 07	13 07	13 07
											R				
Broadmeadow	06 26	07 00	.	07 42	07 42	.	12 06	12 06	12 06	12 06	12 18T	13 09	13 09	13 09	13 09
Woodville Junction	06 30	07 04	.	07 46	07 46	.	12 10	12 10	12 10	12 10	12 22	13 13	13 13	13 13	13 13
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	06 32	07 06	.	07 50T	07 50T	.	12 12	12 12	12 12	12 12	12 24	13 15	13 15	13 15	13 15
Forms or Destination	Kooragang Coal Ldr	Mt Thorley		Acacia Ridge	Acacia Ridge		Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge	Kooragang Coal Ldr	Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS

Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:10).

SECTION 3	031N	TB410	JW73	035N	039N	014M	014M	3AB6	014M	2MB2	029B	031B	027B	TB414	041N
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	1500	1360	850	1000	1000	500	500	1500	500	1500	1500	1500	1500	1360	740
COMMODITY	Spare	Coal	Coal	Spare	Spare	Spare	Spare	General	Spare	General	Spare	Spare	Spare	Coal	Spare
OPERATOR	RailCorp	PNC	PNC	RailCorp	RailCorp	RailCorp	RailCorp	PNIN	RailCorp	PNIN	RailCorp	RailCorp	RailCorp	PNC	RailCorp
SCHEDULE	A1	8GL	1CE	C1	C1	A1	A1	A1	A1	A1	A1	A1	A1	8GL	C
PATH TYPE	S	T	T	S	S	S	S	T	S	T	S	S	S	T	S
	MO				MO	TuO	WO	ThO	FO	TuO	WO	Th.F	MO		Tu.Th.F
Enfield ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	**10 16**	.	**10 37**	**11 36**	.	.	.	.	.	.	**12 46**	**12 46**	**12 46**	.	**13 17**
Chullora SOY	.	.	.	.	.	.	.	**11 45**	.	**12 46L**	.	.	.	.	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	From	.	.	.	.	.	.	.	.	.	.
Chullora Jctns	10 23	.	10 44	11 43	Clyde Up	.	.	11 51T	.	12 53	12 53	12 53	12 53	.	13 24
Flemington Gds South	10 28	.	10 49	11 48	Yards	.	.	11 56	.	12 58	12 58	12 58	12 58	.	13 29
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 32	.	10 52	11 52	12 22T	.	.	11 59	.	13 01	13 02	13 02	13 02	.	13 32
						UG	**UG**		**UG**						
Flemington Markets ..... **arr**	.	.	.	.	.	.	.	12 06	.	.	.	.	.	.	.
dep	10 38	.	10 58	11 58	12 28	**12 26**	**12 26**	12 26T	**12 26**	13 07	13 08	13 08	13 08	.	13 38
Homebush Loop	10 41	.	11 02	12 01	12 31	12 31	12 31	12 31	12 31	13 11	13 11	13 11	13 11	.	13 41
	R		**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**	**XNM**		**XNM**
Nth Strathfield Jctn	10 43	.	11 03	12 03	12 33	12 33	12 33	12 33	12 33	13 12	13 13	13 13	13 13	.	13 43
Concord West	10 46	.	11 06	12 06	12 36	12 36	12 36	12 36	12 36	13 15	13 16	13 16	13 16	.	13 46
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 48	.	11 09	12 08	12 38	12 38	12 38	12 38	12 38	13 17	13 18	13 18	13 18	.	13 48
	XDM														
West Ryde	10 50	.	11 11	12 10	12 40	12 40	12 40	12 40	12 40	13 19	13 20	13 20	13 20	.	13 50
	S		**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**		**S**
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 53	.	11 16	12 15T	12 46T	12 46T	12 46T	12 46T	12 46T	13 23	13 23	13 23	13 23	.	13 52
Epping	10 56	.	11 18	12 19T	12 49T	12 49T	12 49T	12 49T	12 49T	13 25	13 26	13 26	13 26	.	13 55
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	11 05	.	11 30	12 31	13 01	13 01	13 01	13 01	13 01	13 34	13 35	13 35	13 35	.	14 02
	R		**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**		**R**
Hornsby	11 10	.	11 36	12 37T	13 07T	13 07T	13 07T	13 07T	13 07T	13 39	13 39	13 39	13 39	.	14 06
			DM	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**	**DM**		
Hornsby C.S. Jctn	11 11	.	11 38	12 39	13 09	13 09	13 09	13 09	13 09	13 40	13 40	13 40	13 40	.	14 07
Hornsby 2 Down T/B	11 11	.	.	.	.	.	.	.	.	.	.	.	.	.	14 07
	DM														**DM**
Asquith	**...**	.	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	.	**...**
			R												
Berowra	11 22T	.	11 46	12 47	13 17	13 17	13 17	13 17	13 17	13 48	13 48	13 48	13 48	.	14 15
			XM												
Cowan	11 26	.	11 50	12 51	13 21	13 21	13 21	13 21	13 21	13 52	13 52	13 52	13 52	.	14 19
Hawkesbury River	11 36	.	12 00	13 01	13 31	13 31	13 31	13 31	13 31	14 02	14 02	14 02	14 02	.	14 29
Woy Woy	11 50	.	12 16	13 16	13 46	13 46	13 46T	13 46	13 46T	14 16	14 16	14 16	14 16	.	14 43
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	11 57	.	12 23	13 23	13 53	13 53	13 53	13 53	13 53	14 23	14 23	14 23	14 23	.	14 50
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	11 58	.	12 24	13 24	13 54	13 54	13 54	13 54	13 54	14 24	14 24	14 24	14 24	.	14 51
Wyong	12 11	.	12 39	13 40T	14 09	14 09	14 09	14 09	14 09	14 38T	14 38T	14 38T	14 38T	.	15 06
Wyee	12 20	.	12 51	13 52	14 21	14 21	14 21	14 21	14 21	14 47	14 47	14 47	14 47	.	15 17
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	12 23	.	12 55	13 56	14 26	14 25	14 25	14 25	14 25	14 49	14 49	14 49	14 50	.	15 20
Morisset	12 26	.	12 59	14 00	14 29	14 29	14 29	14 29	14 29	14 53	14 53	14 53	14 53	.	15 24
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery Jct	12 35	.	13 10	14 09	14 39	14 38	14 38	14 38	14 38	15 01	15 01	15 01	15 02	.	15 32
Awaba	12 39	.	13 15	14 15	14 44	14 44	14 44	14 44	14 44	15 06	15 06	15 06	15 06	.	15 37
Fassifern	12 44T	.	13 19	14 19	14 48	14 48	14 48	14 48	14 48	15 10	15 10	15 10	15 10	.	15 41
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	12 44	.	13 20	14 19	14 48	14 48	14 48	14 48	14 48	15 10	15 10	15 10	15 11	.	15 41
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	.	**12 45**	.	.	.	.	.	.	.	.	.	.	.	**15 10**	.
Teralba Colliery Jct	12 50	12 55	13 26	14 25	14 55	14 54	14 54	14 54	14 54	15 16	15 16	15 16	15 17	15 20	15 47
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	12 54	12 59	13 29	14 28	14 57	14 57	14 57	14 57	14 57	15 19	15 19	15 19	15 20	15 24	15 50
Sulphide Junction	12 54	13 02	13 29	14 29	14 58	14 58	14 58	14 58	14 58	15 20	15 20	15 20	15 20	15 27	15 51
Adamstown	13 06	13 21	13 39	14 39	15 08	15 08	15 08	15 08	15 08	15 30	15 30	15 30	15 30	15 46	16 01
	DYD		**R**	**DYD**	**DYD**	**R**	**R**	**R**	**R**		**DYD**			**R**	**DYD**
Broadmeadow Yard ..... **arr**	**13 11**	.	**13 43L**	**14 44**	**15 13**	15 12	15 12	15 12	15 12	.	**15 35**	.	.	.	**16 06**
dep		13 25	**14 06x**			15 21	15 21	15 21	15 21	15 31		15 31	15 32	15 49	
Broadmeadow	.	13 26	14 10	.	.	15 25	15 25	15 25	15 25	15 33	.	15 33	15 33	15 54T	.
Woodville Junction	.	13 30	14 14	.	.	15 29	15 29	15 29	15 29	15 37	.	15 37	15 37	15 58	.
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	13 32	14 16	.	.	15 31	15 31	15 31	15 31	15 39	.	15 39	15 39	16 01T	.
Forms or Destination		Kooragang Coal Ldr	Mt Thorley			Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge		Acacia Ridge	Acacia Ridge	Kooragang Coal Ldr	

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:10).

SECTION 3	1581	043N	1443	4443	TB418	TB420	049N	TB422	1511	053N	057N	NW436	1431	063N	1565
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	600	1000	550	550	1010	1010	550	1360	900	1000	1000	800	900	1000	600
COMMODITY	General	Spare	General	General	Spare	Spare	Spare	Coal	General	Spare	Spare	Coal	Steel	Spare	General
OPERATOR	FLA	RailCorp	SSRS	SSRS	RailCorp	RailCorp	RailCorp	PNC	SSRS	RailCorp	RailCorp	PNC	PNIN	RailCorp	IRA
SCHEDULE	C	A1	C	C	8CL	8CL	C1	8GL	C1	C1	C2	6CL	C1	C1	C
PATH TYPE		S			S	S	S	T		S	S	F	T	S	
	M.W	MO	Tu to F	MO					M.W.F				M.W	Tu.Th.F	Tu.Th
Enfield ..... **arr**	.	.	**14 11L**	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 21	**14 16**	**14 16**	.	.	.	**17 51**	.	18 32	**19 05**	**19 36**	.	.	**20 36**	21 02
Chullora SOY	From	.	From	.	.	.	.	.	From	.	.	.	**20 38**	.	From
Chullora Jctn West ..... arr	Botany	.	Cooks	.	.	.	.	.	Botany	.	.	.	.	.	Botany
dep	.	.	River	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctns	13 26	14 23	14 23	.	.	.	17 58	.	18 37	19 12	19 43	.	20 43	20 43	21 07
Flemington Gds South	13 31	14 28	14 28	.	.	.	18 03	.	18 42	19 17	19 48	.	20 48	20 48	21 12
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 34	14 32	14 31	.	.	.	18 07	.	18 45	19 21	19 52	.	20 51	20 52T	21 16
Flemington Markets ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 40	14 38	14 37	.	.	.	18 13	.	18 51	19 27	19 58	.	20 57	20 58	21 23
Homebush Loop	13 43	14 41	14 40	.	.	.	18 17	.	18 55	19 30	20 01	.	21 01	21 01	21 26
	XNM	**XNM**	**XNM**				**R**		**R**	**R**	**R**		**XNM**	**XNM**	**R**
Nth Strathfield Jctn	13 45	14 43	14 42	.	.	.	18 18	.	18 57T	19 32	20 03	.	21 02	21 03	21 28
Concord West	13 48	14 46	14 45	.	.	.	18 21	.	19 02T	19 35	20 06	.	21 05	21 06	21 33
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 50	14 48	14 47	.	.	.	18 23	.	19 05T	19 37	20 08	.	21 07	21 08	21 36
							XDM		**XDM**	**XDM**	**XDM**				**XDM**
West Ryde	13 52	14 50	14 49	.	.	.	18 25	.	19 09T	19 39	20 10	.	21 09	21 10	21 41
	S	**S**	**S**				**S**		**S**	**S**	**S**		**S**	**S**	**S**
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	13 54	14 53	14 52	.	.	.	18 30T	.	19 16T	19 44	20 16	.	21 15	21 15	21 44T
Epping	13 57	14 56	14 54	.	.	.	18 33T	.	19 19T	19 47	20 19	.	21 18	21 18	21 48T
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	14 04	15 05	15 03	.	.	.	18 45	.	19 31	19 59	20 32	.	21 30	21 30	22 00T
	R	**R**	**R**				**R**		**R**	**R**	**R**		**R**	**R**	**R**
Hornsby	14 08	15 09	15 08T	.	.	.	18 52T	.	19 37T	20 04	20 37	.	21 36T	21 36T	22 07T
		DM	**DM**				**DM**		**DM**						
Hornsby C.S. Jctn	14 09	15 10	15 09	.	.	.	18 54	.	19 39	20 06	20 40	.	21 37	21 37	22 08
Hornsby 2 Down T/B	14 09	.	.	.	.	.	.	.	.	20 06	20 40	.	21 38	21 38	22 08
	DM									**DM**	**DM**		**DM**	**DM**	**DM**
Asquith	**...**	**...**	**...**	.	.	.	**...**	.	**...**	**...**	**...**	.	**...**	**...**	**...**
							R								**R**
Berowra	14 17	15 18	15 17	.	.	.	19 03	.	19 47	20 14	20 49	.	21 46	21 46	22 17
							XM								**XM**
Cowan	14 21	15 22	15 21	.	.	.	19 08	.	19 51	20 18	20 53	.	21 50	21 50	22 21T
Hawkesbury River	14 31	15 32	15 31	.	.	.	19 18	.	20 01	20 28	21 03	.	22 00	22 00	22 31T
Woy Woy	14 45	15 46	15 45	.	.	.	19 33	.	20 16	20 43	21 18	.	22 15	22 15	22 45
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	14 52	15 53	15 52	.	.	.	19 40	.	20 23	20 50	21 25	.	22 22	22 25T	22 52
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	14 53	15 54	15 53	.	.	.	19 41	.	20 24	20 51	21 26	.	22 23	22 26	22 53
Wyong	15 08	16 07	16 08	.	.	.	19 56	.	20 40T	21 06	21 42	.	22 38	22 44T	23 08
Wyee	15 19	16 20T	16 21T	.	.	.	20 08	.	20 52	21 18	21 54	.	22 50	22 56	23 19
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	15 22	16 24T	16 24T	.	.	.	20 13	.	20 56	21 23	21 59	.	22 54	23 00	23 22
Morisset	15 26	16 30T	16 30T	.	.	.	20 16	.	21 00	21 26	22 02	.	22 58	23 04	23 26
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery Jct	15 34	16 38	16 38	.	.	.	20 25	.	21 09	21 36	22 13	.	23 07	23 13	23 35T
Awaba	15 39	16 43	16 43T	.	.	.	20 31	.	21 15	21 41	22 18	.	23 13	23 19	23 40T
Fassifern	15 43	16 48T	16 48T	.	.	.	20 35	.	21 19	21 45	22 23	.	23 17	23 23	23 45T
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	**22 45**	.	.	.
Newstan Colliery Jct	15 43	16 48	16 48	.	.	.	20 35	.	21 19	21 45	22 23	22 55	23 17	23 23	23 46
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	.	.	.	.	**16 50**	**20 02**	.	**20 59**	.	.	.	.	.	.	.
Teralba Colliery Jct	15 49	16 54	16 55T	.	17 00	20 12	20 41	21 09	21 25	21 52	22 30	23 07	23 23	23 29	23 52
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	15 52	16 57	16 58	.	17 04	20 16	20 44	21 13	21 28	21 55	22 34	23 09	23 26	23 32	23 55
Sulphide Junction	15 53	16 59T	16 59	.	17 06	20 18	20 45	21 16	21 29	21 55	22 34	23 10	23 27	23 33	23 56
Adamstown	16 03	17 09T	17 09	.	17 23	20 35	20 55	21 35	21 39	22 05	22 44	23 22T	23 37	23 43	00 06
	DYD	**DYD**					**DYD**		**R**	**DYD**	**TR**			**DYD**	**DYD**
Broadmeadow Yard ..... **arr**	16 07	**17 14**	.	.	.	.	**21 00**	.	21 43	**22 10**	**22 49**	.	.	**23 48**	**00 10S**
dep	16 12L		17 10	**17 15**	17 24	20 36		21 39	21 46			23 24T	23 38		**00 52**
	R			**R**											**R**
Broadmeadow	16 15	.	17 12	17 17	17 26	20 38	.	21 40	21 50	.	.	23 27T	23 40	.	00 56
	XM														
Woodville Junction	16 20T	.	17 17T	17 22	17 30	20 42	.	21 44	21 54	.	.	23 32T	23 44	.	01 00
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	16 22	.	17 21T	17 24	17 33T	20 44	.	21 46	21 56	.	.	23 36T	23 46	.	01 02
Forms or Destination	Narrabri		Walsh Point	Walsh Point	Kooragang Coal Ldr	Kooragang Coal Ldr		Kooragang Coal Ldr	Narrabri			Kooragang Coal Ldr	Morandoo		Narrabri

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:11).

SECTION 3	065N	2WB3	3WB3	4WB3	051B	SF69	1YN2	2YN2	3YN2	4YN2	002Y	1423	1411	1411		
Consist																
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght		
LENGTH (M)	900	1200	1200	1200	1200	850	1200	1200	1200	1200	1200	400	635	635		
COMMODITY	Spare	Steel	Steel	Steel	Spare	Coal	Steel	Steel	Steel	Steel	Spare	General	General	General		
OPERATOR	RailCorp	PNIN	PNIN	PNIN	RailCorp	PNC	PNIN	PNIN	PNIN	PNIN	RailCorp	PNRB	SSRS	SSRS		
SCHEDULE	C1	C2	C2	C2	C2	1CE	C1	C1	C1	C1	C1	C2	C1	C1		
PATH TYPE	S	T	T	T	S	T	T	T	T	T	S	T				
	M.W.F	MO	TuO	WO	ThO	FO	MO	TuO	WO	ThO	FO		FO	M to Th		
Enfield ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	23 31L	**23 34L**	.	.
dep	**21 00**	**21 13**	**21 13**	**21 13**	**21 13**	21 34	.	.	.	.	.	.	00 02x	**23 51**	.	.
Chullora SOY	.	.	.	.	.	From	.	.	.	.	.	.	From	From	.	.
Chullora Jctn West ..... arr	.	.	.	.	.	Inner	.	.	.	.	.	.	Botany	Botany	.	.
dep	.	.	.	.	.	Harbour	**22 12**	**22 12**	**22 12L**	**22 12L**	**22 12**	From	.	.	.	.
Chullora Jctns	21 07	21 20	21 20	21 20	21 20	21 39	22 13	22 13	22 13	22 13	22 13	Clyde Up	00 08	23 58	.	.
Flemington Gds South	21 12	21 25	21 25	21 25	21 25	21 44	22 18	22 18	22 18	22 18	22 18	Yards	00 14	00 03	.	.
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	21 15	21 28	21 28	21 28	21 28	21 47	22 21	22 21	22 21	22 21	22 21	22 31	00 22T	00 06	.	.
Flemington Markets ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	21 21	21 35	21 35	21 35	21 35	21 53	22 27	22 27	22 27	22 27	22 27	22 37	00 32T	00 13T	.	.
Homebush Loop	21 26T	21 39T	21 39T	21 39T	21 39T	21 57	22 31	22 31	22 31	22 31	22 31	22 41	00 35	00 17T	.	.
	R	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**XNM**	**XNM**	**XNM**		
Nth Strathfield Jctn	21 28T	21 42T	21 42T	21 42T	21 42T	21 58	22 32	22 32	22 32	22 32	22 32	22 42	00 37	00 19	.	.
Concord West	21 33T	21 47T	21 47T	21 47T	21 47T	22 01	22 35	22 35	22 35	22 35	22 35	22 45	00 40	00 22	.	.
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	21 35	21 50T	21 50T	21 50T	21 50T	22 04	22 37	22 37	22 37	22 37	22 37	22 47	00 42	00 24	.	.
	XDM					**XDM**	**XDM**	**XDM**	**XDM**	**XDM**	**XDM**					
West Ryde	21 41T	21 52	21 52	21 52	21 52	22 06	22 40	22 40	22 40	22 40	22 40	22 49	00 44	00 26	.	.
	S	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**		
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	00 32	.	.
dep	21 46	22 00T	22 00T	22 00T	22 00T	22 11	22 45	22 45	22 45	22 45	22 45	22 57T	00 49	00 42x	.	.
Epping	21 49	22 04T	22 04T	22 04T	22 04T	22 13	22 48	22 48	22 48	22 48	22 48	23 04T	00 52	00 46	.	.
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	22 01	22 18	22 18	22 18	22 18	22 25	23 00	23 00	23 00	23 00	23 00	23 18	01 04	00 58	.	.
	R						**R**	**R**	**R**	**R**	**R**			**R**		
Hornsby	22 06	22 23	22 23	22 23	22 23	22 30	23 05	23 05	23 05	23 05	23 05	23 23	01 09	01 03T	.	.
Hornsby C.S. Jctn	22 08	22 25	22 25	22 25	22 25	22 32	23 07	23 07	23 07	23 07	23 07	23 25	01 11	01 05	.	.
Hornsby 2 Down T/B	22 08	.	.	.	.	.	23 07	23 07	23 07	23 07	23 07	.	.	01 05	.	.
	DM						**DM**	**DM**	**DM**	**DM**	**DM**			**DM**		
Asquith	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	.	.
		R	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**	**R**			**R**		
Berowra	22 16	22 35	22 35	22 35	22 35	22 40	23 15	23 15	23 15	23 15	23 15	23 36	01 19	01 14	.	.
		XM	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**		**XM**		
Cowan	22 20	22 40	22 40	22 40	22 40	22 45	23 20	23 20	23 20	23 20T	23 19	23 41	01 23	01 19	.	.
Hawkesbury River	22 30	22 50	22 50	22 50	22 50	22 55T	23 30	23 30	23 30	23 30	23 30T	23 51	01 33	01 29T	.	.
Woy Woy	22 45	23 05	23 05	23 05	23 05	23 11	23 45	23 45	23 45	23 45	23 45	00 06	01 48	01 45T	.	.
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	22 52	23 12	23 12	23 12	23 12	23 18T	23 53T	23 53T	23 53T	23 53T	23 53T	00 13	01 55	01 54T	.	.
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	22 53	23 13	23 13	23 13	23 13	23 19	23 54	23 54	23 54	23 54	23 54	00 14	01 56	01 55	.	.
Wyong	23 08	23 29	23 29	23 29	23 29	23 34	00 12T	00 12T	00 12T	00 12T	00 12T	00 30	02 11	02 13T	.	.
Wyee	23 20	23 41	23 41	23 41	23 41	23 46	00 24	00 24	00 24	00 24	00 24	00 42	02 23	02 25	.	.
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	23 25	23 46	23 46	23 46	23 46	23 50	00 28	00 28	00 28	00 28	00 28	00 46	02 28	02 30	.	.
Morisset	23 28	23 49	23 49	23 49	23 49	23 54	00 32	00 32	00 32	00 32	00 32	00 50	02 31	02 33	.	.
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery Jct	23 38	24 00	24 00	24 00	24 00	00 05	00 41	00 41	00 41	00 41	00 41	01 00	02 41	02 43	.	.
Awaba	23 43	00 05	00 05	00 05	00 05	00 10	00 47	00 47	00 47	00 47	00 47	01 06	02 46	02 48	.	.
Fassifern	23 47	00 10	00 10	00 10	00 10	00 14	00 51	00 51	00 51	00 51	00 51	01 11	02 50	02 52	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	23 47	00 10	00 10	00 10	00 10	00 15	00 51	00 51	00 51	00 51	00 51	01 11	02 50	02 53	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery Jct	23 54	00 17	00 17	00 17	00 17	00 21	00 57	00 57	00 57	00 57	00 57	01 17	02 57	02 59	.	.
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	23 56	00 20	00 20	00 20	00 20	00 24	01 00	01 00	01 00	01 00	01 00	01 21	02 59	03 02	.	.
Sulphide Junction	23 57	00 21	00 21	00 21	00 21	00 24	01 01	01 01	01 01	01 01	01 01	01 22	02 59	03 02	.	.
Adamstown	00 07	00 31	00 31	00 31	00 31	00 34	01 11	01 11	01 11	01 11	01 11	01 32	03 12T	03 13	.	.
	DYD												**DYD**			
Broadmeadow Yard ..... **arr**	**00 12**	.	.	.	.	.	.	.	.	.	.	.	**03 16&**	.	.	.
dep	———	00 32	00 32	00 32	00 32	00 35	01 12	01 12	01 12	01 12	01 12	01 33	& Stage	03 14	.	.
													and Form			
Broadmeadow	.	00 34	00 34	00 34	00 34	00 37	01 14	01 14	01 14	01 14	01 14	01 35	4441	03 16	.	.
													Monday			
Woodville Junction	.	00 38	00 38	00 38	00 38	00 41	01 18	01 18	01 18	01 18	01 18	01 39	.	03 20	.	.
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	00 40	00 40	00 40	00 40	00 43	01 20	01 20	01 20	01 20	01 20	01 41	.	03 22	.	.
Forms or Destination		Acacia Ridge	Acacia Ridge	Acacia Ridge	Acacia Ridge	Stratford Colliery	Morandoo	Morandoo	Morandoo	Morandoo	Morandoo	Morandoo		Bullock Island		

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:12).

SECTION 3

Consist																
Mondays to Fridays																
LENGTH (M)																
COMMODITY																
OPERATOR																
SCHEDULE																
PATH TYPE																
Enfield ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora Jctns	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flemington Gds South	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Flemington Markets ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Homebush Loop	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Nth Strathfield Jctn	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Concord West	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhodes ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
West Ryde	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eastwood ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Epping	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh Dn Relief ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thornleigh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hornsby	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hornsby C.S. Jctn	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hornsby 2 Down T/B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asquith	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Berowra	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cowan	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hawkesbury River	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Woy Woy	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford Down Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford North	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyong	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vales Point Jctn	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Morisset	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eraring Colliery Jct	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Awaba	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fassifern	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teralba Colliery Jct	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sulphide Jctn Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sulphide Junction	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Adamstown	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Broadmeadow Yard ..... **arr**	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Broadmeadow	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Woodville Junction	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Forms or Destination																

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:13).

SECTION 3	002N	5938	004N	5112	TB401	006N	5166	ER470	ER472	TB405	010N	014B	2NP3	3NY3	4132	
Consist																
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	
LENGTH (M)	1000	850	740	900	1360	600	600	760	760	1360	850	1500	900	900	600	
COMMODITY	Spare	Grain	Spare	General	Spare	Spare	General	Coal	Coal	Coal	Spare	Spare	General	Steel	Steel	
OPERATOR	RailCorp	PNRB	RailCorp	SSRS	RailCorp	RailCorp	IRA	PNC	PNC	PNC	RailCorp	RailCorp	PNIN	PNIN	PNIN	
SCHEDULE	C1	C1	C2	C2	3CE	C2	C2	8CL	8CL	3CE	C2	A1	C1	C1	C1	
PATH TYPE	S	T	S		S	S		T	F	T	S	S	T	T	T	
	M.W.Th	Tu.F	M.Tu.Th	W.F		M.W.F	Tu.Th				Tu.W.Th	Tu to F	MO	TuO	WO	
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	00 10	.	01 02	01 23	.	01 15	02 14	02 50	03 07	.	06 26	06 40	06 40	06 40	.
							R						R	R	R	
Woodville Junction	.	00 12	.	01 04	01 25	.	01 18	02 16	02 52	03 09	.	06 28	06 43T	06 43T	06 43T	.
Broadmeadow	.	00 16	.	01 08	01 29	.	01 22	02 20	02 56	03 13	.	06 32	06 48T	06 48T	06 48T	.
Broadmeadow Yard ..... arr	.	.	.	.	.	.	01 26	.	.	.	.	.	.	.	.	.
dep	**00 16**	00 17	**01 08**	01 09	01 30	**01 51**	01 51L	02 21	02 57	03 14	**05 23**	06 33	06 50	06 50	06 50	.
	XM		**XM**			**XM**	**XM**				**XM**		**XM**	**XM**	**XM**	
Adamstown	00 19	00 19	01 11	01 11	01 32	01 54	01 54	02 23	02 59	03 16	05 26	06 35	06 51	06 51	06 51	.
Sulphide Junction	00 28	00 28	01 21	01 21	01 43	02 04	02 04	02 38	03 14	03 27	05 36	06 43	07 00	07 00	07 00	.
Sulphide Jctn Yard ..... arr	.	.	.	.	.	.	.	.	.	.	05 39	.	.	.	.	.
dep	00 28	00 28	01 21	01 21	01 43	02 04	02 04	02 38	03 14	03 27	.	06 43	07 00	07 00	07 00	.
Teralba Colliery Jct	00 30	00 30	01 23	01 23	01 48	02 06	02 06	02 41	03 17	03 32	.	06 45	07 02	07 02	07 02	.
Teralba Colliery	.	.	.	.	**02 00**	.	.	.	.	**03 44**	.	.	.	.	.	.
Newstan Colliery	.	.	.	.		.	.	.	.		.	.	.	.	.	.
Newstan Colliery Jct	00 37	00 37	01 30	01 30	Not to	02 13	02 13	02 52	03 28	Will not	.	06 52	07 09	07 09	07 09	.
Newstan Colliery	.	.	.	.	run when	.	.	.	.	run when	.	.	.	.	.	.
Fassifern	00 38	00 38	01 31	01 31	TB405	02 14	02 14	02 53	03 29	TB401	.	06 53	07 10	07 10	07 10	.
Awaba	00 42	00 42	01 36	01 36	runs	02 19	02 19	02 59	03 35	runs	.	06 57	07 14	07 14	07 14	.
Eraring Colliery Jct	00 46	00 46	01 40	01 40	.	02 23	02 23	03 07	03 43	.	.	07 01	07 18	07 18	07 18	.
Eraring Colliery	.	.	.	.	.	.	.	**03 12**	**03 48**	.	.	.	.	.	.	.
Morisset	00 56	00 56	01 51	01 51	.	02 34	02 34			.	.	07 09	07 28	07 28	07 28	.
Vales Point Jctn	00 58	00 59	01 53	01 54	.	02 36	02 36	Not to	Not to	.	.	07 12	07 30	07 30	07 30	.
Vales Point Colliery	.	.	.	.	.	.	.	run when	run when	.	.	.	.	.	.	.
Wyee	01 03	01 03	01 59	01 59	.	02 42	02 42	ER472	ER470	.	.	07 15	07 35	07 35	07 35	.
								runs	runs							
Wyong	01 15	01 15	02 11	02 11	.	02 54	02 54	.	.	.	.	07 24	07 47	07 47	07 47	.
Gosford North	01 30	01 30	02 26	02 26	.	03 09	03 09	.	.	.	.	07 37	08 02	08 02	08 02	.
Gosford Up Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	01 31	01 31	02 27	02 27	.	03 10	03 10	.	.	.	.	07 40T	08 03	08 03	08 03	.
Woy Woy	01 39	01 39	02 35	02 35	.	03 18	03 18	.	.	.	.	07 51T	08 11	08 11	08 11	.
Hawkesbury River	01 54	01 54	02 50	02 50	.	03 33	03 33	.	.	.	.	08 07T	08 26	08 26	08 26	.
Cowan	02 17	02 17	03 15	03 15	.	04 00T	04 00T	.	.	.	.	08 23	08 49	08 49	08 49	.
												R	R	R	R	
Cowan Extd Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	08 28	08 54	08 54	08 54	.
dep	.	.	.	.	.	.	.	.	.	.	.	08 37x	09 09x	09 09x	09 09x	.
												XM	XM	XM	XM	
Berowra ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	02 24	02 24	03 22	03 22	.	04 09T	04 09T	.	.	.	.	08 43	09 16	09 16	09 16	.
Hornsby	02 34	02 34	03 33	03 33	.	04 22T	04 22T	.	.	.	.	08 54T	09 26	09 26	09 26	.
Thornleigh	02 38	02 38	03 37	03 37	.	04 26	04 26	.	.	.	.	09 02T	09 30	09 30	09 30	.
		M		M												
Epping	02 45	02 45	03 44	03 44	.	04 33	04 33	.	.	.	.	09 17T	09 37	09 37	09 37	.
	S	S	S	S		S	S									
West Ryde ..... arr	.	.	.	.	.	.	.	.	.	.	.	09 26T	.	.	.	.
dep	02 50	02 50	03 49	03 49	.	04 38	04 38	.	.	.	.	09 35x	09 43	09 43	09 43	.
Rhodes	02 53	02 53	03 52	03 52	.	04 41	04 41	.	.	.	.	09 40	09 46	09 46	09 46	.
	XR	XR	XR	XR		XR	XR					XR	XR	XR	XR	
Concord West	02 55	02 55	03 54	03 54	.	04 44	04 43	.	.	.	.	09 43	09 49	09 49	09 49	.
Nth Strathfield Jctn ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	02 58	02 58	03 57	03 57	.	04 47	04 46	.	.	.	.	09 46	09 52	09 52	09 52	.
Homebush Loop	03 00	03 00	03 59	03 59	.	04 49	04 48	.	.	.	.	09 48	09 54	09 54	09 54	.
	DG	DG	DG	DG		DG	DG					DG	DG	DG	DG	
Flemington Markets ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	03 03	03 03	04 02	04 02	.	04 52	04 53T	.	.	.	.	09 51	09 57	09 57	09 57	.
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	03 09	03 09	04 08	04 08	.	04 58	05 01T	.	.	.	.	09 57	10 03	10 03	10 03	.
Flemington Gds South	03 14	.	04 13	04 13	.	05 03	05 07T	.	.	.	.	10 02	10 09	10 09	10 09	.
Chullora Jctns	03 17	.	04 16	04 16	.	05 06	05 11T	.	.	.	.	10 06	10 12T	10 12T	10 12T	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	**10 09**	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	**10 17**	**10 17**	**10 17**	.
Enfield ..... arr	**03 24**	.	**04 23**	.	.	**05 13**	.	.	.	.	.	.				.
dep		.		04 21	.		05 16	.	.	.	.	.	.	.	.	.
Forms or Destination		Clyde Up Yards		Botany			Botany				07 12 Up	014B Melbourne	11 25	11 25		

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:14).

SECTION 3	5NY3	6NY3	010N	ER476	020B	020B	3BA6	4BS6	5BS6	014N	026B	2BM4	3BM4	4BM4	5BM4
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	900	900	850	760	1500	1500	1500	1200	1500	600	1500	1500	1500	1500	1500
COMMODITY	Steel	Steel	Spare	Coal	Spare	Spare	General	General	General	Spare	Spare	General	General	General	General
OPERATOR	PNIN	PNIN	RailCorp	PNC	RailCorp	RailCorp	PNIN	PNIN	PNIN	RailCorp	RailCorp	PNIN	PNIN	PNIN	PNIN
SCHEDULE	C1	C1	C2	8CL	A1	A1	A1	A1	A1	C2	A1	A1	A1	A1	A1
PATH TYPE	T	T	S	F	S	S	T	T	T	S	S	T	T	T	T
	ThO	FO	Tu.W.Th		MO	TuO	WO	ThO	FO		MO	TuO	WO	ThO	FO
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	06 40	06 40	.	07 00	08 44	08 44	08 44	08 44	08 44	.	09 30	09 30	09 30	09 30	09 30
	R	**R**									**R**	**R**	**R**	**R**	**R**
Woodville Junction	06 43T	06 43T	.	07 02	08 46	08 46	08 46	08 46	08 46	.	09 33T	09 33T	09 33T	09 33T	09 33T
Broadmeadow	06 48T	06 48T	.	07 06	08 50	08 50	08 50	08 50	08 50	.	09 37	09 37	09 37	09 37	09 37
Broadmeadow Yard ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	06 50	06 50	.	07 07	08 51	08 51	08 51	08 51	08 51	**08 55**	09 39	09 39	09 39	09 39	09 39
	XM	**XM**								**XM**	**XM**	**XM**	**XM**	**XM**	**XM**
Adamstown	06 51	06 51	From	07 09	08 53	08 53	08 53	08 53	08 53	08 59	09 40	09 40	09 40	09 40	09 40
Sulphide Junction	07 00	07 00	Broadmea-	07 24	09 01	09 01	09 01	09 01	09 01	09 09	09 48	09 48	09 48	09 48	09 48
			dow Yard												
Sulphide Jctn Yard ..... arr	.	.	**R**	.	.	.	.	.	.	.	.	.	.	.	.
dep	07 00	07 00	07 12x	07 24	09 01	09 01	09 01	09 01	09 01	09 09	09 48	09 48	09 48	09 48	09 48
			XM												
Teralba Colliery Jct	07 02	07 02	07 17	07 27	09 03	09 03	09 03	09 03	09 03	09 11	09 50	09 50	09 50	09 50	09 50
Teralba Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	07 09	07 09	07 24	07 38	09 10	09 10	09 10	09 10	09 10	09 18	09 57	09 57	09 57	09 57	09 57
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fassifern	07 10	07 10	07 25	07 39	09 11	09 11	09 11	09 11	09 11	09 19	09 58	09 58	09 58	09 58	09 58
Awaba	07 14	07 14	07 30	07 45	09 15	09 15	09 15	09 15	09 15	09 24	10 02	10 02	10 02	10 02	10 02
Eraring Colliery Jct	07 18	07 18	07 34	07 53	09 19	09 19	09 19	09 19	09 19	09 28	10 06	10 06	10 06	10 06	10 06
Eraring Colliery	.	.	.	**07 58**	.	.	.	.	.	.	.	.	.	.	.
Morisset	07 28	07 28	07 45		09 27	09 27	09 27	09 27	09 27	09 39	10 14	10 14	10 14	10 14	10 14
Vales Point Jctn	07 30	07 30	07 47	.	09 30	09 30	09 30	09 30	09 30	09 41	10 16	10 16	10 16	10 16	10 16
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	07 35	07 35	07 53	.	09 33	09 33	09 33	09 33	09 33	09 47	10 20	10 20	10 20	10 20	10 20
Wyong	07 47	07 47	08 06T	.	09 42	09 42	09 42	09 42	09 42	09 59	10 31T	10 31T	10 31T	10 31T	10 31T
Gosford North	08 02	08 02	08 26T	.	09 55	09 55	09 55	09 55	09 55	10 14	10 46T	10 46T	10 46T	10 46T	10 46T
Gosford Up Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	08 03	08 03	08 28T	.	09 56	09 56	09 56	09 56	09 56	10 15	10 48T	10 48T	10 48T	10 48T	10 48T
Woy Woy	08 11	08 11	08 40T	.	10 04	10 04	10 04	10 04	10 04	10 23	10 56	10 56	10 56	10 56	10 56
Hawkesbury River	08 26	08 26	08 55	.	10 18	10 18	10 18	10 18	10 18	10 38	11 10	11 10	11 10	11 10	11 10
Cowan	08 49	08 49	09 21	.	10 34	10 34	10 34	10 34	10 34	11 03	11 27T	11 27T	11 27T	11 27T	11 27T
	R	**R**	**R**		**R**	**R**	**R**	**R**	**R**	**R**					
Cowan Extd Refuge ..... arr	08 54	08 54	09 26	.	10 39	10 39	10 39	10 39	10 39	11 08	.	.	.	.	.
dep	09 09x	09 09x	10 23x	.	10 51x	10 51x	10 51x	10 51x	10 51x	11 21x	.	.	.	.	.
	XM	**XM**	**XM**		**XM**	**XM**	**XM**	**XM**	**XM**	**XM**					
Berowra ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 16	09 16	10 30	.	10 56	10 56	10 56	10 56	10 56	11 28	11 33T	11 33T	11 33T	11 33T	11 33T
Hornsby	09 26	09 26	10 41	.	11 08T	11 08T	11 07T	11 07T	11 07T	11 39T	11 43	11 43	11 43	11 43	11 43
Thornleigh	09 30	09 30	10 45	.	11 14T	11 14T	11 14T	11 14T	11 14T	11 44T	11 47	11 47	11 47	11 47	11 47
Epping	09 37	09 37	10 52	.	11 22	11 22	11 22	11 22	11 22	11 52T	11 55T	11 55T	11 55T	11 55T	11 55T
			S		**S**	**S**	**S**	**S**	**S**	**S**					
West Ryde ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 43	09 43	10 58T	.	11 27	11 27	11 27T	11 27T	11 27T	11 57T	12 01	12 01	12 01	12 01	12 01
Rhodes	09 46	09 46	11 01	.	11 30	11 30	11 30	11 30	11 30	12 00	12 06T	12 06T	12 06T	12 06T	12 06T
	XR	**XR**	**XR**		**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**
Concord West	09 49	09 49	11 04	.	11 32	11 32	11 33	11 33	11 33	12 03	12 11T	12 11T	12 11T	12 11T	12 11T
Nth Strathfield Jctn ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 53	09 53	11 07	.	11 36	11 36	11 36T	11 36T	11 36T	12 06	12 15T	12 15T	12 15T	12 15T	12 15T
Homebush Loop	09 55	09 55	11 09	.	11 38	11 38	11 38	11 38	11 38	12 08	12 17	12 17	12 17	12 17	12 17
	DG	**DG**	**DG**		**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**
Flemington Markets ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 58	09 58	11 12	.	11 41	11 41	11 41	11 41	11 41	12 11	12 20	12 20	12 20	12 20	12 20
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 04	10 04	11 18	.	11 47	11 47	11 47	11 47	11 47	12 17	12 26	12 26	12 26	12 26	12 26
Flemington Gds South	10 09	10 09	11 23	.	11 52	11 52	11 52	11 52	11 52	12 22	12 32	12 32	12 32	12 32	12 32
Chullora Jctns	10 13T	10 13T	11 26	.	11 55	11 55	11 56T	11 56T	11 56T	12 25	12 35	12 35T	12 35T	12 35T	12 35T
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	**12 38**	**12 38**	**12 38**	**12 38**	**12 38**
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	**10 18**	**10 18**	.	.	.	.	**12 01**	**12 01**	**12 01**	.	.	.	.	.	.
Enfield ..... arr			**11 33**	.	**12 02**	**12 02**				**12 32**	.	.	.	.	.
dep	.	.		.			.	.	.		.	.	.	.	.
		11 25					18 45				026B Melbourne	12 44	12 44	12 44	12 44
Forms or Destination															

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS

Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:14).

SECTION 3	2BM7	3BM7	4BM7	5BM7	018N	TB409	4112	TB413	TB417	026N	030N	2BW4	3BW4	4BW4	5BW4
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	1200	1200	1200	1200	635	1360	635	1360	1010	1000	1500	1200	1200	1200	1200
COMMODITY	General	General	General	General	Spare	Coal	General	Coal	Spare	Spare	Spare	Steel	Steel	Steel	Steel
OPERATOR	INTRL	INTRL	INTRL	INTRL	RailCorp	PNC	SSRS	PNC	RailCorp	RailCorp	RailCorp	PNIN	PNIN	PNIN	PNIN
SCHEDULE	A1	A1	A1	A1	C2	3CE	C2	3CE	3CE	C2	C1	C1	C1	C1	C1
PATH TYPE					S	T		T	S	S	S	T	T	T	T
	TuO	WO	ThO	FO	MO						MO	TuO	WO	ThO	FO
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	09 43	09 43	09 43	09 43	.	09 48	10 51	12 41	14 29	.	.	16 43	16 43	16 43	16 43
									R						
Woodville Junction	09 45	09 45	09 45	09 45	.	09 50	10 53	12 45	14 32T	.	.	16 45	16 45	16 45	16 45
Broadmeadow	09 49	09 49	09 49	09 49	.	09 54	10 57	12 49	14 36	.	.	16 49	16 49	16 49	16 49
Broadmeadow Yard ..... arr	.	.	.	.	.	.	.	.	14 38	.	.	.	.	.	.
dep	09 50	09 50	09 50	09 50	**09 50**	09 56	10 58	12 50	14 49x	**15 58**	**16 51**	16 51T	16 51T	16 51T	16 51T
					XM				**XM**	**XM**	**XM**				
Adamstown	09 52	09 52	09 52	09 52	09 53	09 58	11 00	12 52	14 52	16 01	16 54	16 54T	16 54T	16 54T	16 54T
Sulphide Junction	10 00	10 00	10 00	10 00	10 03	10 10	11 10	13 03	15 03	16 11	17 03	17 03	17 03	17 03	17 03
Sulphide Jctn Yard ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 00	10 00	10 00	10 00	10 03	10 11	11 10	13 04T	15 03	16 11	17 03	17 03	17 03	17 03	17 03
Teralba Colliery Jct	10 02	10 02	10 02	10 02	10 05	10 16	11 12	13 08	15 08	16 13	17 05	17 05	17 05	17 05	17 05
Teralba Colliery	.	.	.	.	.	**10 28**	.	**13 22**	**15 20**	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	10 09	10 09	10 09	10 09	10 12	.	11 19	.	.	16 20	17 12	17 12	17 12	17 12	17 12
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Fassifern	10 10	10 10	10 10	10 10	10 13	.	11 20	.	.	16 21	17 13	17 13	17 13	17 13	17 13T
Awaba	10 14	10 14	10 14	10 14	10 18	.	11 25	.	.	16 26	17 17	17 17	17 17	17 17	17 17
Eraring Colliery Jct	10 18	10 18	10 18	10 18	10 22	.	11 29	.	.	16 30	17 21	17 21	17 21	17 21	17 21
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Morisset	10 26	10 26	10 26	10 26	10 33	.	11 40	.	.	16 41	17 31	17 31	17 31	17 31	17 31
Vales Point Jctn	10 29	10 29	10 29	10 29	10 35	.	11 43	.	.	16 43	17 33	17 33	17 33	17 33	17 33
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	10 32	10 32	10 32	10 32	10 41	.	11 48	.	.	16 49	17 38	17 38	17 38	17 38	17 38
Wyong	10 41	10 41	10 41	10 41	10 53	.	12 00	.	.	17 01	17 50	17 50	17 50	17 50	17 50
Gosford North	10 54	10 54	10 54	10 54	11 09T	.	12 15	.	.	17 16	18 09T	18 09T	18 09T	18 09T	18 09T
Gosford Up Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	10 55	10 55	10 55	10 55	11 11T	.	12 16	.	.	17 17	18 11T	18 11T	18 11T	18 11T	18 11T
Woy Woy	11 03	11 03	11 03	11 03	11 23T	.	12 24	.	.	17 25	18 23T	18 23T	18 23T	18 23T	18 23T
Hawkesbury River	11 17	11 17	11 17	11 17	11 42T	.	12 39	.	.	17 40	18 38	18 38	18 38	18 38	18 38
Cowan	11 33	11 33	11 33	11 33	12 08	.	13 04	.	.	18 05	19 01	19 01	19 01	19 01	19 01
	R	**R**	**R**	**R**	**R**		**R**			**R**	**R**	**R**	**R**	**R**	**R**
Cowan Extd Refuge ..... arr	11 38	11 38	11 38	11 38	12 13	.	13 09	.	.	18 10	19 06	19 06	19 06	19 06	19 06
dep	11 52x	11 52x	11 52x	11 52x	12 21x	.	13 22x	.	.	18 23x	19 27x	19 27x	19 27x	19 27x	19 27x
	XM	**XM**	**XM**	**XM**	**XM**		**XM**			**XM**	**XM**	**XM**	**XM**	**XM**	**XM**
Berowra ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	11 58	11 58	11 58	11 58	12 28	.	13 29	.	.	18 30	19 34	19 34	19 34	19 34	19 34
Hornsby	12 08	12 08	12 08	12 08	12 39	.	13 40	.	.	18 41	19 44	19 44T	19 44T	19 44T	19 44T
Thornleigh	12 14T	12 13T	12 13T	12 13T	12 44T	.	13 44	.	.	18 47T	19 48	19 48	19 48	19 48	19 48
Epping	12 22	12 22T	12 22T	12 22T	12 52	.	13 52T	.	.	18 57T	19 57T	19 57T	19 57T	19 57T	19 57T
	S	**S**	**S**	**S**	**S**		**S**			**S**	**S**	**S**	**S**	**S**	**S**
West Ryde ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	12 27T	12 27	12 27T	12 27T	12 57T	.	13 57	.	.	19 05T	20 06T	20 06T	20 06T	20 06T	20 06T
Rhodes	12 30	12 30	12 30	12 30	13 00	.	14 00	.	.	19 11T	20 10T	20 10T	20 10T	20 10T	20 10T
	XR	**XR**	**XR**	**XR**	**XR**		**XR**			**XR**	**XR**	**XR**	**XR**	**XR**	**XR**
Concord West	12 33	12 33	12 33	12 33	13 03	.	14 03	.	.	19 13	20 13	20 13	20 13	20 13	20 13
Nth Strathfield Jctn ..... arr	.	.	.	.	13 08	.	.	.	.	.	.	.	.	.	.
dep	12 36	12 36	12 36	12 36	13 22x	.	14 06	.	.	19 16	20 17T	20 17T	20 17T	20 17T	20 17T
Homebush Loop	12 38	12 38	12 38	12 38	13 25	.	14 08	.	.	19 18	20 19	20 19	20 19	20 19	20 19
	DG	**DG**	**DG**	**DG**	**DG**		**DG**			**DG**	**DG**	**DG**	**DG**	**DG**	**DG**
Flemington Markets ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	12 41	12 41	12 41	12 41	13 28	.	14 11	.	.	19 21	20 22	20 22	20 22	20 22	20 22
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	12 47	12 47	12 47	12 47	13 34	.	14 17	.	.	19 27	20 28	20 28	20 28	20 28	20 28
Flemington Gds South	12 52	12 52	12 52	12 52	13 39	.	14 22	.	.	19 33	20 33	20 33	20 33	20 33	20 33
Chullora Jctns	12 56	12 56	12 56	12 56	13 42	.	14 25	.	.	19 35	20 36	20 36	20 36	20 36	20 36
Chullora Jctn West ..... arr	12 59	12 59	12 59	12 59	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enfield ..... arr	.	.	.	.	**13 49**	.	.	.	.	**19 41**	**20 43**	**20 43**	**20 43**	**20 43**	**20 43**
dep	.	.	.	.		.	14 30	.	.						
Forms or Destination	2BM7 Melbourne	3BM7 Melbourne	4BM7 Melbourne	5BM7 Melbourne			Botany					21 46	21 46	21 46	21 46

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
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Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:15).

SECTION 3	4124	TB419	JW62	NW435	TB421	032B	3BM2	034B	032B	032B	034N	036B	5182	5182	036N
Consist															
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght
LENGTH (M)	400	1010	850	800	1360	1500	1500	1500	1500	1500	550	1500	600	650	1000
COMMODITY	General	Spare	Coal	Coal	Coal	Spare	General	Spare	Spare	Spare	Spare	Spare	General	General	Spare
OPERATOR	PNRB	RailCorp	PNC	PNC	PNC	RailCorp	PNIN	RailCorp	RailCorp	RailCorp	RailCorp	RailCorp	FLA	FLA	RailCorp
SCHEDULE	B1	3CE	2CL	5CE	3CE	A1	A1	A1	A1	A1	C1	A1	C2	C1	C1
PATH TYPE	T	S	T	F	T	S	T	S	S	S	S	S			S
						MO	TuO	WO	ThO	FO		WO	TuO	WO	M.Th
Islington Junction arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	17 01	17 22	17 41	18 18	19 09	19 59	19 59	19 59	19 59	19 59	.	21 08	21 02	20 38	.
		R	R			R	R	R	R	R			R	R	
Woodville Junction	17 03	17 25T	17 44T	18 20	19 11	20 02T	20 02T	20 02T	20 02T	20 02T	.	21 10	21 05T	20 41T	.
Broadmeadow	17 07	17 29	17 48	18 24	19 15	20 06	20 06	20 06	20 06	20 06	.	21 14	21 09	20 45	.
		UTR													
Broadmeadow Yard arr	.	17 31	17 52	.	.	20 10	20 10	20 10	20 10	20 10	.	.	21 12	**20 48**	.
dep	17 08	17 33T	17 56L	18 25	19 16	20 28	20 28	20 28	20 28	20 28	**20 33**	21 15	21 18x	**21 18**	**21 22**
		XM	XM			XM	XM	XM	XM	XM	XM		XM	XM	XM
Adamstown	17 10	17 36	17 59	18 27	19 18	20 31	20 31	20 31	20 31	20 31	20 38	21 17	21 21	21 21T	21 25
Sulphide Junction	17 19	17 47	18 09	18 38	19 29	20 39	20 39	20 39	20 39	20 39	20 47	21 25	21 31	21 31	21 34
Sulphide Jctn Yard arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	17 19	17 47	18 09	18 39	19 29	20 39	20 39	20 39	20 39	20 39	20 47	21 25	21 31	21 31	21 34
				XM											
Teralba Colliery Jct	17 21	17 52	18 12	18 42	19 34	20 41	20 41	20 41	20 41	20 41	20 49	21 27	21 33	21 33	21 36
Teralba Colliery	.	**18 04**	.	.	**19 46**	.	.	.	.	.	.	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Newstan Colliery Jct	17 28	.	18 19	18 49	.	20 48	20 48	20 48	20 48	20 48	20 56	21 34	21 40	21 40	21 43
Newstan Colliery	.	.	.	**18 55**	.	.	.	.	.	.	.	.	.	.	.
Fassifern	17 29	.	18 20		.	20 49	20 49	20 49	20 49	20 49	20 57	21 35	21 41T	21 41	21 44
Awaba	17 33	.	18 25	.	.	20 53	20 53	20 53	20 53	20 53	21 01	21 39	21 46	21 46	21 48
Eraring Colliery Jct	17 37	.	18 30	.	.	20 57	20 57	20 57	20 57	20 57	21 05	21 43	21 50	21 50	21 52
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Morisset	17 47	.	18 40	.	.	21 05	21 05	21 05	21 05	21 05	21 15	21 51	22 01	22 01T	22 02
Vales Point Jctn	17 50	.	18 44	.	.	21 07	21 07	21 07	21 07	21 07	21 17	21 54	22 03	22 03	22 04
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	17 54	.	18 48	.	.	21 11	21 11	21 11	21 11	21 11	21 22	21 57	22 09	22 09T	22 09
Wyong	18 03	.	19 00	.	.	21 20	21 20	21 20	21 20	21 20	21 34	22 06	22 21	22 21	22 21
Gosford North	18 20T	.	19 15	.	.	21 33	21 33	21 33	21 33	21 33	21 49	22 19	22 36	22 36	22 36
	R														
Gosford Up Refuge arr	18 22T	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	18 46x	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	UM														
Gosford arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	18 49	.	19 16	.	.	21 34	21 34	21 34	21 34	21 34	21 50	22 20	22 37	22 37	22 37
Woy Woy	18 57	.	19 25	.	.	21 42	21 42	21 42	21 42	21 42	21 58	22 28	22 45	22 45	22 45
Hawkesbury River	19 12	.	19 40	.	.	21 56	21 56	21 56	21 56	21 56	22 13	22 42	23 00	23 00	23 00
Cowan	19 38T	.	20 05	.	.	22 12	22 12	22 12	22 12	22 12	22 36	22 58	23 25	23 25T	23 23
			R								R				
Cowan Extd Refuge arr	.	.	20 11	.	.	.	.	.	.	.	22 41	.	.	.	.
dep	.	.	20 24x	.	.	.	.	.	.	.	22 52x	.	.	.	.
			XM								XM				
Berowra arr	.	.	.	.	.	.	.	.	.	.	.	.	23 32	23 32	.
dep	19 45T	.	20 31	.	.	22 17	22 17	22 17	22 17	22 17	22 59	23 03	.	.	23 30
Hornsby	19 56	.	20 42	.	.	22 27	22 27	22 27	22 27	22 27	23 09	23 13	.	.	23 40
Thornleigh	20 00	.	20 46	.	.	22 31	22 31	22 31	22 31	22 31	23 13	23 17	.	.	23 44
	M											M			
Epping	20 07	.	20 54	.	.	22 38	22 38	22 38	22 38	22 38	23 20	23 24	.	.	23 51
						S	S	S	S	S	S	S			S
West Ryde arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	20 13	.	21 00	.	.	22 43	22 43	22 43	22 43	22 43	23 25	23 31T	.	.	23 56
Rhodes	20 16	.	21 03	.	.	22 46	22 46	22 46	22 46	22 46	23 28	23 37T	.	.	23 59
	XR		XR			XR	XR	XR	XR	XR	XR	XR			XR
Concord West	20 19	.	21 06	.	.	22 48	22 48	22 48	22 48	22 49	23 32	23 41	.	.	00 01
Nth Strathfield Jctn arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	20 23T	.	21 09	.	.	22 51	22 51	22 51	22 51	22 52	23 35	23 45	.	.	00 04
Homebush Loop	20 25	.	21 11	.	.	22 53	22 53	22 53	22 53	22 54	23 37	23 47	.	.	00 06
	DG		DG			DG	DG	DG	DG	DG	DG	DG			DG
Flemington Markets arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	20 28	.	21 14	.	.	22 57T	22 56	22 56	22 56	22 57	23 40	23 50	.	.	00 09
Flemington Gds Jctns arr	20 35	.	.	.	.	.	.	.	.	.	.	23 57	.	.	.
dep	20 43x	.	21 20	.	.	23 04T	23 02	23 02	23 02	23 03	23 46	00 04x	.	.	00 15
Flemington Gds South	.	.	21 25	.	.	23 09	23 07	23 07	23 07	23 08	23 51	00 11	.	.	00 20
Chullora Jctns	.	.	21 28	.	.	23 13T	23 11T	23 11T	23 10	23 11	23 54	00 14	.	.	00 23
Chullora Jctn West arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	**23 18**	**23 16**	**23 16**	.	.	.	.	.	.	.
Enfield arr	.	.	**21 35**	.	.	.	.	.	**23 17**	**23 18**	**00 01**	**00 21**	.	.	**00 29**
dep	.	.		.	.	.	.	.					.	.	
	Clyde Up Yards		22 41			01 38 TuO	01 34 WO		01 31 FO	00 56 SatO		01 31 ThO	23 32 Up	23 32 Up	

Forms or Destination

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS

Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)

Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:16).

SECTION 3	5182	5182	040N	NW437	JW74	JW74	JW74	JW74	JW74	4144	4144	TB427	046N	D420	5BM2	
Consist																
Mondays to Fridays	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Fght	Loco	Fght	
LENGTH (M)	600	650	1000	800	850	850	850	850	850	550	550	1360	1000	50	1500	
COMMODITY	General	General	Spare	Coal	Coal	Coal	Coal	Coal	Coal	General	General	Coal	Spare	Loco	General	
OPERATOR	FLA	FLA	RailCorp	PNC	PNC	PNC	PNC	PNC	PNC	SSRS	SSRS	PNC	RailCorp	PNC	PNIN	
SCHEDULE	C2	C1	A1	5CE	2CL	2CL	2CL	2CL	2CL	C2	C2	3CE	C2	LE	A1	
PATH TYPE			S	F	T	T	T	T	T			T	S	T	T	
	TuO	WO	MO		MO	TuO	WO	ThO	FO	M to Th	FO			FO	ThO	
Islington Junction ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	21 38	21 25	21 25	21 25	21 25	21 25	22 05	22 05	22 47	.	23 31	23 59	.
					R	**R**	**R**	**R**	**R**	**R**	**R**	**R**				
Woodville Junction	.	.	.	21 40	21 27	21 27	21 27	21 27	21 27	22 07	22 07	22 49	.	23 33	00 01	.
Broadmeadow	.	.	.	21 44	21 31	21 31	21 31	21 31	21 31	22 11	22 11	22 53	.	23 36	00 05	.
										UYD	**UYD**					
Broadmeadow Yard ..... arr	.	.	.	.	**21 34**	**21 34**	**21 34**	**21 34**	**21 34**	**22 14L**	**22 14L**	.	.	.	.	.
dep	.	.	**21 38**	21 45	**22 01L**	**22 01L**	**22 01L**	**22 01L**	**22 01L**	**22 19**	**22 19**	22 56	**23 16**	23 37	00 06	.
			XM		**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**	**XM**			
Adamstown	.	.	21 43	21 47	22 05	22 05	22 05	22 05	22 05	22 22	22 22	22 57	23 21	23 39	00 08	.
Sulphide Junction	.	.	21 51	21 58	22 15	22 15	22 15	22 15	22 15	22 32	22 32	23 08	23 31	23 48	00 16	.
Sulphide Jctn Yard ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	21 51	21 58	22 15	22 15	22 15	22 15	22 15	22 32	22 32	23 08	23 31	23 48	00 16	.
Teralba Colliery Jct	.	.	21 53	22 01	22 18	22 18	22 18	22 18	22 18	22 34	22 34	23 13	23 33	23 50	00 18	.
Teralba Colliery	.	.	.	.	.	.	.	.	.	.	.	**23 25**	.	.	.	.
Newstan Colliery	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
Newstan Colliery Jct	.	.	22 00	22 07	22 25	22 25	22 25	22 25	22 25	22 41	22 41	.	23 40	24 00	00 25	.
Newstan Colliery	.	.	.	**22 13**	.	.	.	.	.	.	.	.	.	.	.	.
Fassifern	.	.	22 01		22 26	22 26	22 26	22 26	22 26	22 42	22 42	.	23 41	00 01	00 26	.
Awaba	.	.	22 05	.	22 31	22 31	22 31	22 31	22 31	22 47	22 47	.	23 46	00 07	00 30	.
Eraring Colliery Jct	.	.	22 09	.	22 36	22 36	22 36	22 36	22 36	22 51	22 51	.	23 50	00 12	00 34	.
Eraring Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Morisset	.	.	22 17	.	22 46	22 46	22 46	22 46	22 46	23 02	23 02	.	00 01	00 23	00 42	.
Vales Point Jctn	.	.	22 19	.	22 50	22 50	22 50	22 50	22 50	23 04	23 04	.	00 03	00 27	00 45	.
Vales Point Colliery	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyee	.	.	22 23	.	22 54	22 54	22 54	22 54	22 54	23 10	23 10	.	00 09	00 33	00 48	.
Wyong	.	.	22 35T	.	23 06	23 06	23 06	23 06	23 06	23 22	23 22	.	00 21	00 50	00 57	.
Gosford North	.	.	22 48	.	23 21	23 21	23 21	23 21	23 21	23 37	23 37	.	00 36	01 13	01 10	.
Gosford Up Refuge ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gosford ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	.	.	22 49	.	23 22	23 22	23 22	23 22	23 22	23 38	23 38	.	00 37	01 15	01 11	.
Woy Woy	.	.	22 57	.	23 31	23 31	23 31	23 31	23 31	23 46	23 46	.	00 45	01 25	01 19	.
Hawkesbury River	.	.	23 11	.	23 46	23 46	23 46	23 46	23 46	00 01	00 01	.	01 00	01 43	01 33	.
Cowan	.	.	23 32T	.	00 11	00 11	00 11	00 11	00 11	00 26	00 26	.	01 25	01 59	01 49	.
Cowan Extd Refuge ..... arr	From	From	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	Islington	Islington	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Junction	Junction														
Berowra ..... arr	**UM**	**UM**	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	23 32	23 32	23 37T	.	00 18	00 18	00 18	00 18	00 18	00 33	00 33	.	01 32	02 04	01 54	.
Hornsby	23 43	23 43	23 54T	.	00 29	00 29	00 29	00 29	00 29	00 44	00 44	.	01 43	02 15	02 04	.
Thornleigh	23 47	23 47	23 59T	.	00 33	00 33	00 33	00 33	00 33	00 48	00 48	.	01 47	02 20	02 08	.
	M	**M**												**M**	**M**	
Epping	23 54	23 54	00 08T	.	00 41	00 41	00 41	00 41	00 41	00 55	00 55	.	01 54T	02 27	02 15	.
	S	**S**								**S**	**S**		**S**	**S**	**S**	
West Ryde ..... arr	.	.	00 16	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	23 59	24 00	00 27x	.	00 48	00 48	00 48	00 48	00 48	01 00	01 00	.	02 02T	02 32	02 20	.
Rhodes	00 02	00 03	00 33T	.	00 51	00 51	00 51	00 51	00 51	01 03	01 03	.	02 07T	02 35	02 23	.
	XR	**XR**	**XR**		**XR**	**XR**	**XR**	**XR**	**XR**	**XR**	**XR**		**XR**	**XR**	**XR**	
Concord West	00 04	00 05	00 36	.	00 53	00 53	00 53	00 53	00 53	01 05	01 05	.	02 13T	02 38	02 25	.
Nth Strathfield Jctn ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	00 07	00 08	00 39	.	00 56	00 56	00 56	00 56	00 56	01 08	01 08	.	02 16	02 41	02 28	.
Homebush Loop	00 09	00 10	00 41	.	00 58	00 58	00 58	00 58	00 58	01 10	01 10	.	02 18	02 42	02 30	.
	DG	**DG**	**DG**		**DG**	**DG**	**DG**	**DG**	**DG**	**DG**	**DG**		**DG**	**DG**	**DG**	
Flemington Markets ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	00 12	00 13	00 44	.	01 01	01 01	01 01	01 01	01 01	01 13	01 13	.	02 21	02 45	02 33	.
Flemington Gds Jctns ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
dep	00 18	00 19	00 50	.	01 07	01 07	01 07	01 07	01 07	01 19	01 19	.	02 27	02 51	02 39	.
Flemington Gds South	00 23	00 24	00 55	.	01 13	01 13	01 13	01 13	01 13	01 24	01 24	.	02 33T	02 54	02 44	.
Chullora Jctns	00 26	00 27	00 58	.	01 15	01 15	01 15	01 15	01 15	01 27	01 27	.	02 37T	02 57	02 48T	.
Chullora Jctn West ..... arr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	**02 53**	.
dep	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chullora SOY	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enfield ..... arr	.	.	**01 04**	.	**01 21**	**01 21**	**01 21**	**01 21**	**01 21**	.	.	.	**02 44**	.	.	.
dep	00 31	00 32		.						01 32	01 32	.		.	.	.
	Botany	Botany			01 21 TuO	01 21 WO	01 21 ThO	01 21 FO	01 36 SatO	Botany	Botany			Delec	5BM2 Melbourne	

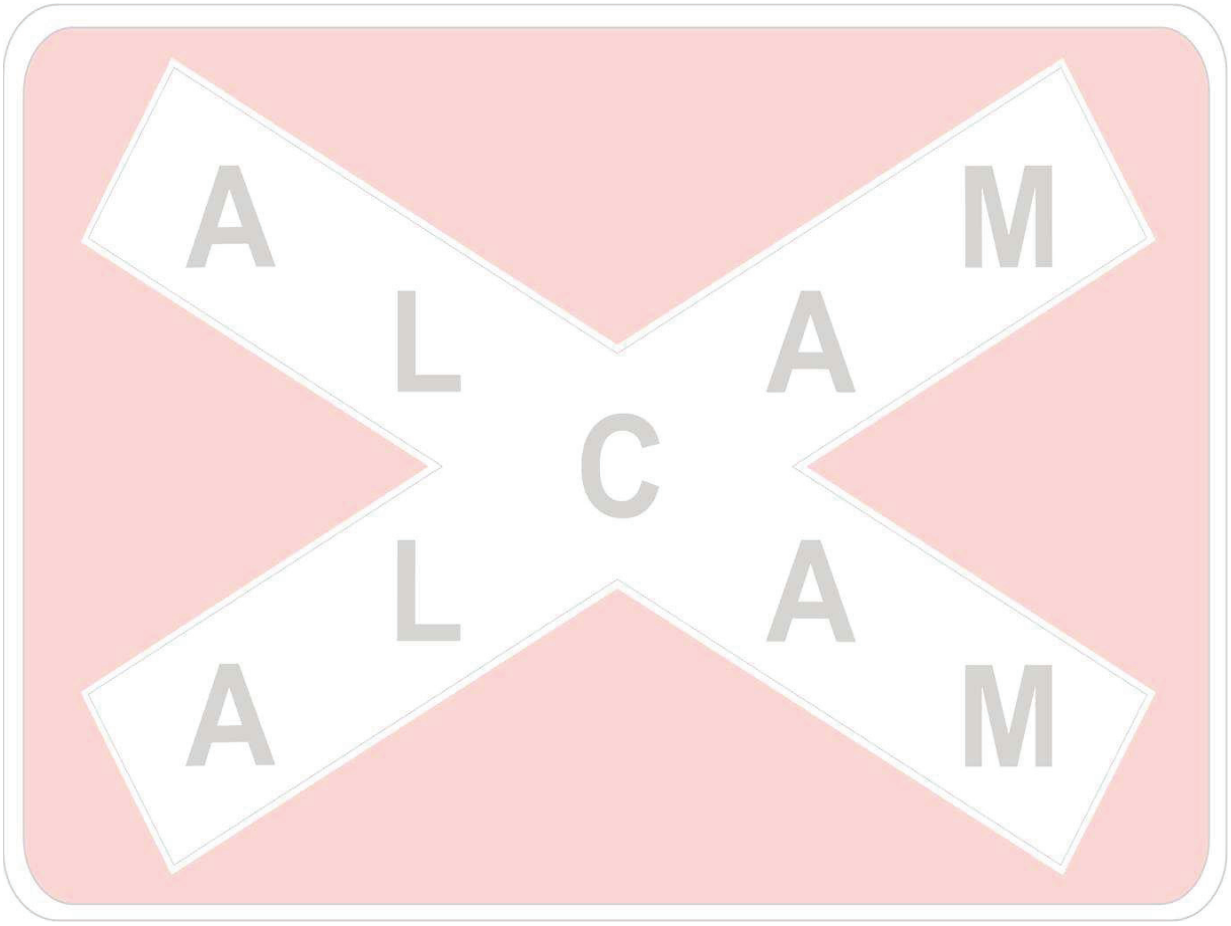
Forms or Destination

COMPLETE SERVICE IN THIS SECTION IS DETAILED IN THE SECTION MAPS
Freight Standard Working Timetable, Book 4, Mondays to Fridays, Version 3.43 (111222)
Effective from 30 January 2012 Mondays to Fridays (22 December, 2011, 14:26:17).

Appendix D

Level Crossing Safety References

The Australian Level Crossing Assessment Model



ALCAM in Detail

Updated 2nd February 2010

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APPENDIX A – ALCAM Example – Typical Passive Level Crossing

APPENDIX B – ALCAM Example – Typical Active Level Crossing

APPENDIX C – Road Level Crossing – Characteristics, Controls & Accident Mechanisms

APPENDIX D – Pedestrian Level Crossing – Characteristics, Controls & Accident Mechanisms

The Australian Level Crossing Assessment Model

1.0 Summary

The Australian Level Crossing Assessment Model (ALCAM) is an assessment tool used to identify key potential risks at level crossings and to assist in the prioritisation of railway level crossings according to their comparative safety risk. It is used to support a rigorous defensible process for decision making for both road and pedestrian level crossings as well as a method to help determine the most cost effective treatments.

At the May 2003 Australian Transport Council (ATC) meeting all state and territory transport ministers agreed to adopt this innovative method of risk assessment. ALCAM is currently applied nation wide across Australia and New Zealand and is overseen by a committee of representatives from the various jurisdictions of these countries to ensure its consistency of development and implementation.

ALCAM is a complex scoring algorithm which considers each level crossings physical properties (characteristics and controls) including consideration of the related common human behaviours, to provide each level crossing with a "Likelihood Factor" score. This score is then multiplied by the level crossings "Exposure" score (a factor taking into account the volumes of Vehicles / Pedestrians & Trains) & finally multiplied by the Consequence score to give the ALCAM Risk Score. The ALCAM Risk Score, enables the comparison of the relative scores across level crossings within a given jurisdiction. This provides an overall risk rating for the level crossing however each individual hazard needs to be considered in its own right.

ALCAM Risk Score = Likelihood Factor x Exposure x Consequence

ALCAM produces both an overall comparative risk score for each level crossing as well as highlighting where specific potential hazards exist. It utilises likelihood bands as a preliminary means of determining the potential level of likelihood of an incident (High / Medium / Low) at a level crossing. ALCAM is then used in the determination of proposed treatments to address these hazard areas. A total data management system is used (the Level Crossing Management System – LXM) to allow for the effective management of ALCAM data as well as other important information (such as accident history) which assists in the overall decision making process.

The model allocates weighted points to characteristics and controls at a level crossing to calculate a Likelihood Factor. The weightings applied have been determined through a series of workshops with contribution from experts including representatives from each mainland state of Australia and New Zealand covering expertise in road and rail engineering. In excess of 100 individuals, primarily from Australia's road and rail jurisdictions, with expertise collectively covering the areas of level crossing safety have been involved in the development of ALCAM from its conception in 1999 through to its continuing development and current use. The weightings take into account the likelihood and impact of a series of identified accident causal / human factors (accident mechanisms) and to what comparative degree each characteristic and control measure at a level crossing contributes to and/or impacts on these accident mechanisms.

It is important to note that ALCAM is only one of the tools used in the safety assessment of level crossings. Consideration also needs to be made to address other elements such as full social and economical impact as well as level crossing specific safety factors. Whilst ALCAM does produce various outputs, this does not preclude the need for sound engineering, operational, and human factor judgment. It should be used in conjunction with stakeholder level crossing assessments, standards, and other risk mitigation strategies. ALCAM should be applied by road and / or railway safety engineers or other similar professionally qualified staff who have been trained by approved ALCAM instructors in the proper application of ALCAM. This needs to be combined with appropriate expertise and experience in railway level crossing safety, risk management and knowledge of the applicable railway level crossing standards.

2.0 Introduction

Each state and territory in Australia and New Zealand is responsible for road and rail transport regulation within its jurisdiction. Each jurisdiction has a level crossing strategy committee comprising high-level management representation from both road and rail entities. These committees are chartered with the continuing improvement of safety at level crossings within their jurisdiction. The major difficulty in addressing risks at level crossings is the determination of how to achieve the optimal results with the available resources. A tool, which consistently assesses the characteristics at each level crossing, was required to effectively determine priorities when addressing safety hazards at these level crossings. A project team was formed to establish such a tool, which has now undergone a variety of improvements to reach the stage it is at today. (See table 2). Prior to ALCAM, various methods of level crossing analysis were utilised involving basic risk allocation combined with accident history and predetermined warrants (exposure based levels of control, eg upgrade from flashing lights to booms at a road / rail exposure of 100,000). These methods did not encompass sufficient detail to adequately address some of the more critical / complex safety hazards such as queuing, short stacking and sight visibility standards.

The main benefits of ALCAM and the LXM system include the:

- The ability to rank level crossings within a jurisdiction using a consistent basis according to a detailed level of comparable risk, exposure and consequence
- The identification of specific risk characteristics
- Assessment of the overall effects of proposed treatments
- The provision of a level crossing warehouse inventory/ asset management database and photographs
- A means by which road and rail authorities can liaise with each other in respect of their individual and/or joint legislative and public risk reduction responsibilities
- The capacity to measure the reduction or elimination road/rail interface risk as defined by the National Transport Commission (NTC) Model Rail Safety Bill 2006 and the various jurisdictions Rail Safety Act legislation
- The capacity for each railway crossing safety dollar to be spent where it can best generate the greatest safety improvement, by allowing the amount of capital investment in railway crossing safety to be applied to a far larger number of risk mitigation measures

Through the Australian Transport Council of Ministers (ATC) and the Standing Committee of Transport (SCOT) all state and territory transport ministers agreed to adopt the Australian Level Crossing Assessment Model. ALCAM is overseen by a committee (the National ALCAM Group) of representatives from these states and territories to ensure its consistency of development and implementation.

The National ALCAM Group is overseen by the Safety Standing Sub Committees' Rail Level Crossing Group (RLCG) which reports to ATC through SCOT.

2.1 ALCAM in NSW

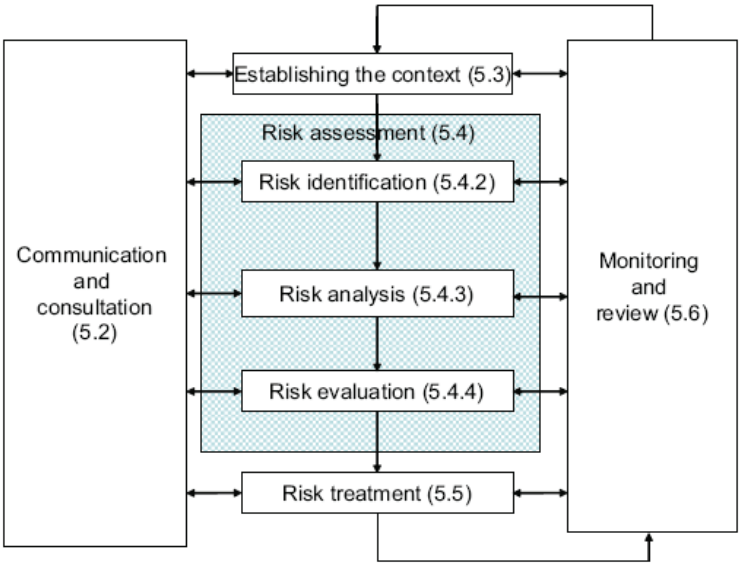
NSW public road level crossings are ranked according to their ALCAM risk score and this list is used to help inform which level crossings are upgraded under the Level Crossing Improvement Program. Level crossings may be upgraded out of ALCAM order as some sites have simpler development requirements than others.

ALCAM is also used by road and rail stakeholders to help identify potential risk areas at level crossings. It is generally accepted that the outputs from ALCAM are a good starting point for carrying out safety risk assessments at level crossings.

3.0 Risk

Risk (effect of uncertainty on objectives) is widely known and accepted as the combination of both the likelihood (probability or frequency) of the occurrence of an event and the resulting consequence (outcome or impact) of that event once it has taken place. The risk management process as outlined in the International Standard ISO 31000:2009, which follows a simple series of steps as outlined below (Figure 1):

Figure 1 – Risk Management Process



ALCAM and the ALCAM process considers all elements outlined in ISO 31000. It involves communication and consultation with a wide range of technical experts as well as the local stakeholders at individual level crossings. The context is well established as the safety risks relating to the potential of a collision at the at grade intersection of a roadway and railway. It identifies, analyses and evaluates the risks inherent at level crossings as well as giving a determination of the adequacy of proposed treatments for the risks. Finally the model and the results produced from the model are regularly monitored and under a process of continual review and improvement.

In line with safety risk modelling principles ALCAM looks at risk from the viewpoint of consideration of loss (negative consequence) only as opposed to risk and reward (loss and gain).

The model considers both qualitative and quantitative characteristics as well as assessing the impact of physical properties (characteristics and controls) including consideration of the related common human behaviours. It looks at the likelihood of a collision as well as the consequential effects resulting from that collision. The model allocates weightings to each characteristic in relation to how it would contribute to a collision and assesses what impact the existing controls would have on these characteristics.

4.0 ALCAM Formula

In simple terms ALCAM is a mathematical tool which considers physical characteristics and controls in existence at both road and pedestrian level crossings. It considers these elements as well as the common motorist/pedestrian behaviour at the site to provide a “Likelihood Factor” score and “ALCAM Risk Score” for each level crossing which enables the comparison of relative risk across all level crossings within a given jurisdiction. The ALCAM Mechanics as outlined on the following pages have been illustrated graphically in Figure 4, and as examples in Appendix A & B.

4.1 Likelihood Factor

ALCAM Risk Score = **Likelihood Factor** x Exposure x Consequence

4.1.1 *Accident Mechanisms, Characteristics & Controls*

The main calculation engine within ALCAM involves a matrix of weightings relating to how much each nominated characteristics at a level crossing influences the potential accident causal / human factors (accident mechanisms). The model also determines the impact the existing controls would have on these accident mechanisms. Significant and practical accident mechanisms, characteristics and controls have been considered and included through a process of seeking expert opinion through a series of workshops and interviews. The full listing of characteristics, controls and accident mechanisms for both road and pedestrian level crossings can be found in Appendix C and D respectively

Accident Mechanisms include significant and practical accident causal factors associated with a collision between a level crossing user (motorist or pedestrian) and a train. They have been determined based on experience of accident history as well as expert knowledge.

Mechanisms have been grouped into the following categories:

- where the level crossing user is **unaware** of the dangerous situation.
- where the level crossing user is **unable to avoid** the dangerous situation.
- where the level crossing user is **unwilling** to recognise the dangerous situation.

Each of these mechanisms is then weighted based on a six by six probability matrix. A mechanism's weighting is calculated as the product of the occurrence and collision probability rating (weighting score between 1 and 36).

- **Occurrence Probability** – is a measure of how often the accident causal factor (accident mechanism) is likely to come into play.
- **Collision Probability** – is a measure of the likelihood of an incident if the accident causal factors (accident mechanism) comes into play.

A characteristic is defined as a physical feature of a roadway or railway, or of a level crossing user (motorist or pedestrian), which may to some degree contribute to each of the accident mechanisms occurring. Characteristics include items such as sighting, speed of trains, queuing or short stacking.

Controls are devices installed or implemented to improve the safety hazard profile of the site and can included devices such as flashing warning lights, boom gates, signage, improved road alignment and through the effects of education and law enforcement campaigns.

4.1.2 The ALCAM Matrix

A matrix has been constructed to represent the effect each characteristic would have on each accident mechanism. Some characteristics may have no causal effect on a particular accident mechanism, whilst some may have a partial effect. If a characteristic is the only contributor to a given mechanism then the percentage weighting will be 100%. The total percentage effect for each mechanism must total 100%.

The final output from the Matrix is a Likelihood Factor score which is used to help determine whether or not a level crossing is likely to require safety improvement works.

Since the development of the original matrix, several workshops have been held to both add and remove accident mechanisms, characteristics and controls. The need for these changes has generally risen from concerns / recommendations raised by users of the model.

The current version of the matrix produces results, which have been shown to accurately reflect the current hazard profile at each site. This has been determined through a detailed analysis and comparison of the results of a number of sample sites across each of the major Australian States in combination with ongoing review of model outputs.

4.1.3 Sensitivity

A combination of both the weighted percentages and mechanism weightings result in each of the accident mechanisms having a different impact on the overall ALCAM Risk Score at any particular level crossing. There are particular characteristics, which have a greater influence on the overall risk profile at each level crossing. These characteristics include limited sighting of trains (at passive sites), limited approach sighting, queuing and short stacking, proximity to shunting yards and stations, high percentage of heavy vehicles and a hump or dip across the tracks.

It is these highly sensitive accident mechanisms which have the greatest influence on whether or not a level crossing will be prioritised for safety improvement works.

4.2 Exposure (Vehicles or Pedestrians x Trains)

ALCAM Risk Score = Likelihood Factor x **Exposure** x Consequence

Exposure for each level crossing is determined by multiplying the actual road traffic volume (V) or the pedestrian volume (P) and the train volume (T). The result of which is either a VT for road level crossings or a PT for pedestrian level crossings.

The overall likelihood of an incident at a level crossing is represented by a combination of the Likelihood Factor and the Exposure

LF x VT (or PT).

4.3 Consequence

ALCAM Risk Score = Likelihood Factor x Exposure x **Consequence**

Currently ALCAM utilises a relatively simple methodology for the determination of a Consequence factor based on the information shown in the Table 1 below. The Consequence factor (C) is determined as a relationship between an environmental factor and a train speed factor.

Table 1 recognises and represents the likely outcome once a collision has occurred. It considers both a train speed factor and an environmental factor. The combination of these two elements results in a modification factor (Consequence). For example, where there is a situation which involves very low train speeds and minimal exposure the VT would be reduced by a factor of 10 (Consequence factor = 0.1). At the other extreme where there are high train speeds and the potential for high exposure to human life (passenger train, or bus) the VT is increased by a factor of 10 (Consequence factor = 10).

Table 1 – Factors Affecting Consequence

Factors affecting Consequences		Speed				
		0 - 60	61 -80	81 - 100	101 - 120	> 120
Environmental Factors	Index	1	2	3	4	5
Curve within stoping distance & Points in direction of travel	1	4	10	10	10	10
Road under bridge or river bridge	2	4	10	10	10	10
Steep embankment 3m +	3	4	4	10	10	10
Multiple track	4	3	4	10	10	10
School bus route	5	3	4	10	10	10
High proportion of heavy vehicles using the level crossing +10%	6	0.1	3	4	10	10
Tunnel within the stopping distance	7	0.1	3	3	10	10
Medium embankment	8	2	3	3	4	4
Curve within stopping distance & No other environmental concerns	9	1	2	3	3	3
Straight track + passengers	10	1	1	3	3	3
Straight track + freight only	11	0.1	1	1	3	3

Consequence effects are only relevant to vehicle level crossing incidents, as pedestrian level crossing incidents are limited in their range of effect to the pedestrian involved in the collision and there is no real likelihood of infrastructure damage. In the pedestrian matrix, the consequence score is 1.

The system of consequence modifiers has been developed to have the effect of inflating or deflating the Exposure Score for the level crossing by up to a factor of 10, as a means of recognising the potential human life impact of a collision.

Work is currently under way to utilise event tree modelling to better represent the potential outcomes of a collision at a level crossing. This will result in Consequence Factors, which more accurately reflect the potential outcomes of the collision, as they will be based on actual statistical data rather than the current expert opinion.

4.4 Likelihood Bands

The ALCAM Likelihood Factor score in conjunction with Likelihood Bands is used to indicate the likelihood of an incident at the level crossing (High / Medium / Low) based on the exposure of each individual rail vehicle, road vehicle or pedestrian, which can then be used to assist in the determination of whether treatment is likely to be required at a particular level crossing. To identify whether the controls at a level crossing are likely to be considered adequate, ALCAM compares the Likelihood Factor with Likelihood Bands.

For a level crossing, where the Likelihood Factor falls in the High Likelihood Bands, treatment is generally considered as a high priority. Such treatment should be effective enough to reduce the proposed Likelihood Factor to a Low Likelihood Bands as well as addressing all risks to a level which is considered to be as low as reasonably practicable.

For a level crossing with a Likelihood Factor in the Medium Likelihood Band, a further assessment should be carried out to determine if there are treatments which can be employed which would be considered as low as reasonably practicable.

For a level crossing with a Likelihood Factor below the Low Likelihood Band, in most cases, is likely to be within acceptable limits and may not require to be prioritised for remedial works. A review of the hazards should be carried out on a regular basis on these sites to ensure there has been no significant change to the profile and that there are no specific individual hazards which require urgent attention (such as queuing, short stacking and standards compliance).

For a new level crossing the Likelihood Factor should fall in the Low Likelihood Band and should consider the future road/rail traffic volumes. Sites with a Likelihood Band in the Low Likelihood Category are generally considered to be at a level which is as low as reasonably practicable; however other factors

may have an impact such as Flags (see Section 4.6) and if an identified hazard can be reasonably practicably mitigated then action should be taken to ensure this hazard is addressed.

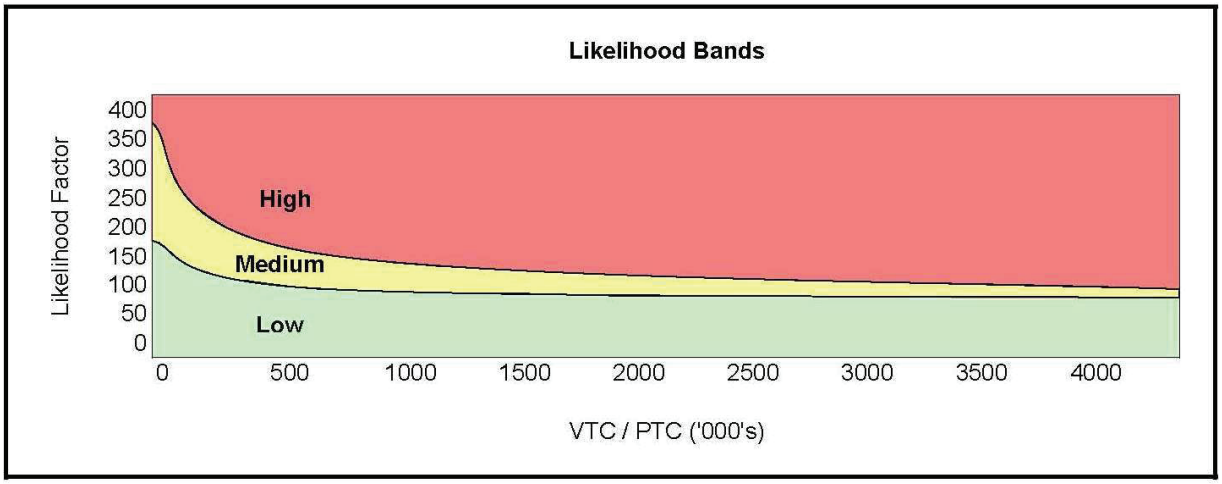
Figure 2 illustrates the different Likelihood Bands and action most likely to be required for each.

Figure 2 – Likelihood Bands

HIGH	**Safety improvement highly likely** - Factors have been identified that may require priority attention and are likely to require mitigation works to be undertaken to return to an acceptable level.
MEDIUM	**Safety improvement to be considered -** Factors have been identified that may require further assessment by road and railway entities. Remedial action may be required to address hazards.
LOW	**Safety at site to be monitored** - Indicative that appropriate control is in place and that remedial action may not be required. Ongoing monitoring by road and railway entities is required. (Consider Flags).

These Likelihood Bands are defined on a scale dependant on the exposure rating (VTC or PTC). As the exposure increases, the acceptable likelihood level will decrease. This recognises that where there is a higher level of exposure there is a greater opportunity for an incident to eventuate and therefore a lower tolerable level of likelihood. Figure 3 illustrates the general shape of the Likelihood Category bands.

Figure 3 – Likelihood Bands (Graphic Representation)



4.5 ALCAM Risk Score

The final overall comparative score which is produced by ALCAM is called the “ALCAM Risk Score” (ARS). This number is a product of the Likelihood Factor, Exposure and Consequence scores, and it is this figure which allows comparison of level crossings against each other within a given jurisdiction based on the level of risk. By sorting level crossings in relation to their ARS a priority listing can be created which can then be used to assist in the development of safety improvement programs.

4.6 Flags

There are particular hazards at level crossings which are identified for consideration regardless of level crossings overall Likelihood Factor or Likelihood Band (H/M/L). Flags are used to highlight specific characteristics or risks which may have a low probability of occurring however may result in a situation which is considered unacceptable (eg queuing and short stacking). ALCAM flags such areas of concern to allow further assessment to ensure they are not left unconsidered. A compliance flag is also included in relation to the requirements of the relevant Australian Standard (AS1742.7).

4.7 Treatment

Once a level crossings particular profile has been established suitable risk mitigation treatments / safety improvement works options can be determined. ALCAM allows the user to run various proposed mitigations measures and consider the impact based on the theoretical reduction in overall and specific ALCAM risk scores.

It must be understood that active controls (flashing lights and boom barriers) are not always the answer. The proposed mitigation must address the specific hazards particular to each level crossing. For example, at a level crossing where queuing has been identified as a hazard, the introduction of active controls such as boom gates may reduce the overall risk at the level crossing, however it may not address the queuing hazard and may actually compound the hazards associated with vehicles queued on the tracks. A more suitable solution may involve changes to road infrastructure on the departure side of the level crossing or interfacing with adjacent road traffic controls.

It is also very important to ensure that all stakeholders associated with the particular level crossing are involved with the determination of the final recommended treatment. Although ALCAM is a comprehensive tool for the assessment of level crossing hazards, it cannot make an assessment of unique situations particular to individual a level crossing. An on-site meeting of all relevant stakeholders is recommended at each level crossing to ensure any unique hazards are identified and treated as required. A level crossing incident history and any other contributing hazards should also be considered at this stakeholder meeting and addressed as required.

It is important to ensure that if an identified hazard can reasonably practicably be mitigated then action should be taken to ensure that this hazard is addressed.

4.8 Cost Benefit

As a part of the determination of the optimal treatment to be implemented at an individual level crossing ALCAM can be used to provide an analysis of the theoretical reduction in risk of a proposal verses the estimated cost of that treatment. This then allows the comparison of a number of options in relation to their cost benefit. This information can then used at the stakeholder meeting to assist in the determination of the optimal solution.

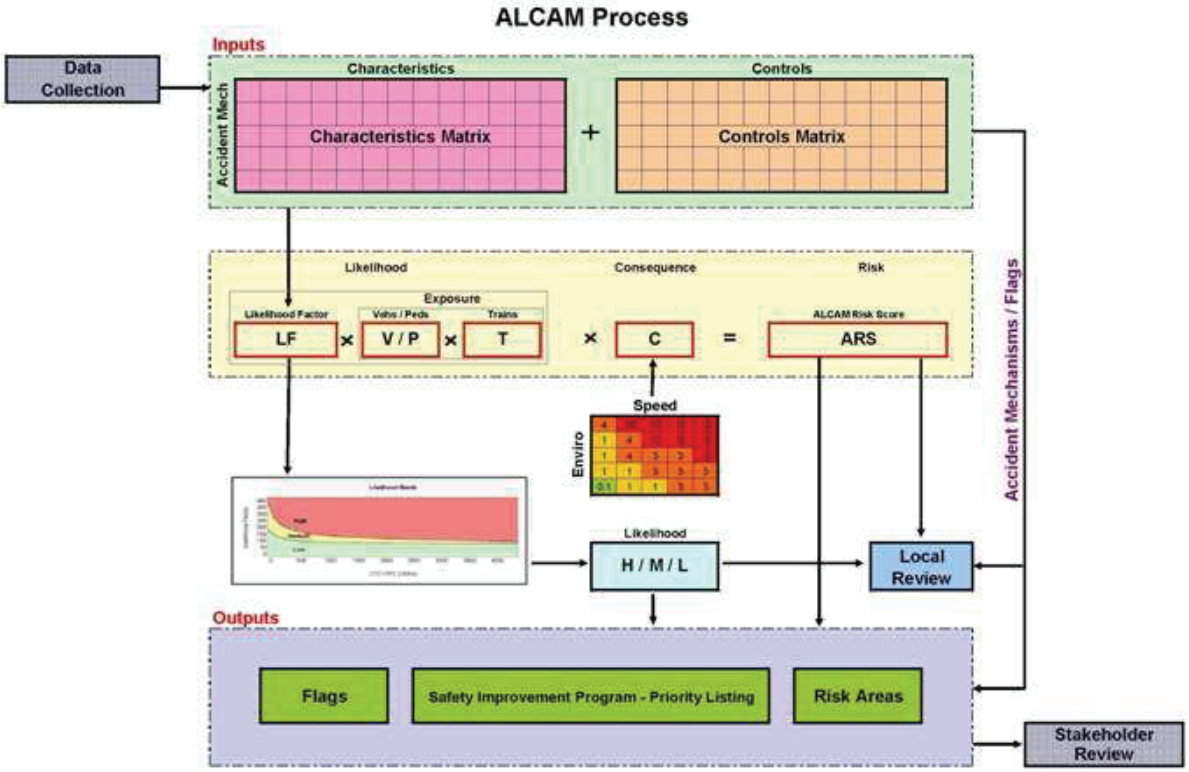
5.0 ALCAM Process

The ALCAM process involves the collection of data through a combination of level crossing surveys and train and vehicle information from the respective rail and road authorities. Each level crossing must be assessed uniformly using a standardised procedure to gather level crossing data. This requires a simple yet explicit process for the determination of quantitative information in combination with detailed instructions on the determination of qualitative information. Once the data is collected and entered into ALCAM, reports can be run to produce a priority listing, which can be used as the basis for determining safety improvement programs. A total data management system is provided (the Level Crossing Management System – LXM) to allow for the effective management of ALCAM data as well as other important information (such as incident history and digital photographs) which assists in the overall decision making process.

Potential treatment options are determined through the use of ALCAM and a treatment report is prepared. The proposals as outlined in this report are then discussed at an on-site stakeholder meeting, where the highlighted hazards and proposed treatments are combined with any site specific hazards and treatments. This process ensures that level crossings are addressed on a consistent priority basis and that all safety hazards have been addressed.

The ALCAM process is represented graphically in Figure 4. This shows the flow of information through from data collection, input, the model calculations, road and rail volumes, Consequence and Likelihood Categories Bands through ALCAM itself and on the outputs and how these feed into the stakeholder review and eventually to the finalisation of proposed safety improvement works.

Figure 4 – ALCAM Process



The above diagram (and the examples in Appendix A & B) illustrates the process and mechanics of ALCAM and the ALCAM formula. Starting at the top left of the diagram data is collected in the field and through a number of other sources including Road and Rail Authority traffic data information. This information flows into the ALCAM matrix and a Likelihood Factor (LF) is calculated dependant on the particular level crossings characteristics and controls and the weightings which have been developed for ALCAM. This LF is multiplied by the exposure (PT or VT- product of pedestrians or vehicles and trains) and finally by the Consequence Factor (C). This calculation results in what is known as the ALCAM Risk Score (ARS).

At the same time the LF is compared to the Likelihood Bands to give a preliminary indication of the level of likelihood of an incident occurring at the level crossing. Depending on the ARS, LF, Stakeholder analysis of site specific features and any other influencing factors decisions can then be made of the need for treatment and level of priority given to this treatment. This may be in the form of state-wide upgrade programs or through a local review between road and rail stakeholders.

Appendices A & B then go on and illustrate how ALCAM can provide an indication of the degree of improvements likely to be achieved through different mitigations as well as consideration of the cost benefit of these mitigations.

6.0 The History of ALCAM

Table 2 – The history of ALCAM development

1999	A project team was formed, part of its role was to establish a tool and technical guidelines for the assessment and treatment of level crossings and oversee the development of a database for level crossings. Prior to this project there was little evidence of a standard process whereby all level crossings were assessed in a consistent manner. The processes included a search of existing level crossing assessment tools which found a number of simple formula methods (eg The Warren Henry Formula) which considered elements such as road / rail traffic volumes, number of tracks, road grade / curvature, adjacent intersections, sun glare, etc. Accordingly, the project team developed a risk scoring system referred to as the "Risk Scoring Matrix". This system provided a process for evaluating the Risk Score of a level crossing based on its existing characteristics and controls. It also enabled the identification of improvements to the Risk Score due to the implementation of selected controls and changes to characteristics.
2002	The project team identified that some modifications were required to improve the outputs of the Risk Scoring Matrix. A national committee was established to ensure that the Risk Scoring Matrix was used consistently and uniformly across the nation. The matrix was re-named the Australian Level Crossing Assessment Model (ALCAM) and the committee as the ALCAM Group. Part of this committee's brief was also to develop a database that would enable the model to be used by all ALCAM members in the risk assessment of their level crossings. The ALCAM Technical Committee was commissioned as an ALCAM Group sub-committee of the ALCAM group to further develop and improve the current risk assessment tool and to produce the first version of a national level crossing assessment tool.
2003	The ALCAM Group initiated major reviews of both the vehicle and pedestrian assessment matrices by the ALCAM Technical Committee. In February an independent review of the processes used to review ALCAM took place. During 2003 Australian Transport Council (ATC) and SCOT (Rail Group) sanctioned that the ALCAM be adopted nationally. In addition, the Australian Railway Level Crossing Safety Implementation Group (ARLCSIG) was authorised to overview the ALCAM process of setting the standard for the Vehicle and Pedestrian matrices within ALCAM.
2004	Following a number of enhancements a new version of the ALCAM was released in May 2004. A Microsoft Access database was developed (Level Crossing Management System – LXM) as a useful tool for maintaining data and running assessments. It was adopted formally by the ALCAM Group.
2005	ALCAM Technical Committee was formed to progress technical issues associated with the ongoing development of ALCAM. A workshop was held to commence work on pedestrian crossing weightings and a pedestrian level crossing matrix was added to ALCAM and issued in May 2005 and was incorporated in the LXM system.

2006	Favourable findings in a report received on the integrity of ALCAM and a determination of the legal position of ALCAM if challenged in court. Paper on ALCAM presented to the 9th International Trespass and level crossing symposium outlining the process and outputs. A series of Flags introduced in ALCAM to highlight particular areas representing high levels of risk at level crossings and well as areas related to standards conformance.
2007	Changes made in ALCAM (especially in relation to sighting distance requirements) to align with the 2007 version of AS1742.7. New Zealand invited to joint the National ALCAM Group and commence collection data to use ALCAM. Work commence on the development of a Consequence event tree to replace the current simple Consequence factor used in ALCAM
2008	Structure changes made within ALCAM to ensure alignment with AS/NZ4360 the risk management standard The Australian Road Research Board (ARRB) was commissioned to carry out several projects including: • A comparison between ALCAM and the UK model the All Level Crossing Risk Model (ALCRM) • An analysis of the relationship between ALCAM outputs and actual incident information • A review of the structure of ALCAM in consideration of its alignment with general risk principles.
2009	Significant changes made to the terminology used in ALCAM to address issues raised by the National ALCAM Group and reports commissioned into the models robustness and alignment with general risk principles. ALCAM documentation and training material developed and training courses made more readily available to level crossing practitioners including contractors. Significant changes made to the LXM to incorporate requirements of ARTC to use ALCAM across multiple states and as a higher security level. An ALCAM Weightings Workshop was held in Sydney to fine tune the matrix and to incorporate changes recommend above.

7.0 The Future of ALCAM

ALCAM continues to be developed with fine-tuning of weightings, introduction of new level crossing control technology and most recently the commencement of refinement of the Consequence Factor. The development occurring in relation to the Consequence Factor is incorporating the principles of Cause – Consequence modelling through the use of event trees. An event tree is used to analyse a sequence of possible events which will result in a certain outcome. Each final outcome in the tree can have a value allocated to it and a corresponding likelihood of it occurring.

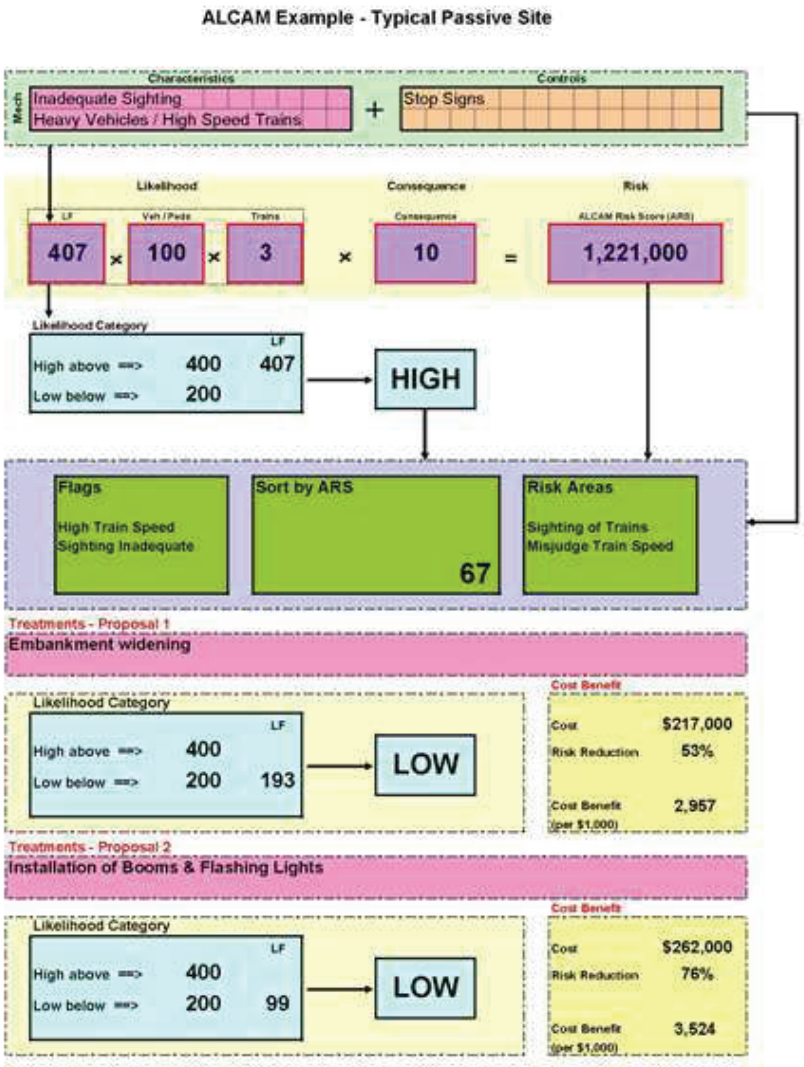
8.0 Definitions / Acronyms

Accident Mechanism	Accident Mechanisms include significant and practical accident causal factors associated with a collision between a level crossing user (motorist or pedestrian) and a train.
ALCAM	The Australian Level Crossing Assessment Model
ALCAM Matrix	The matrix which represents the effect each characteristic & control has on each accident mechanism
ATC	The Australian Transport Council which is a Ministerial forum for Commonwealth, State and Territory consultations and provides advice to governments on the coordination and integration of all transport and road policy issues at a national level
Characteristics	A characteristic is defined as a physical feature of a roadway or railway, or of a level crossing user (motorist or pedestrian), which may to some degree contribute to each of the accident mechanisms occurring. Characteristics include items such as sighting, speed of trains, queuing or short stacking.
Consequence (C)	Consequence (C) is a factor representing the potential outcome of a level crossing incident. It is determined as a relationship between an environmental factor and a train speed factor
Controls	Controls are devices installed or implemented to improve the safety hazard profile of the level crossing and can included devices such as flashing warning lights, boom gates, signage, improved road alignment and through the effects of education and law enforcement campaigns.
Exposure (VT)	Exposure for each site is determined by multiplying the actual road traffic volume (V) or the pedestrian volume (P) and train volume (T). The result of which is either a VT for road level crossings or a PT for pedestrian level crossings.
Flags	There are particular hazards at level crossings which are identified for consideration. These are referred to as Flags and are used to highlight areas which may have a low likelihood of occurrence however may result in a situation which is considered unacceptable (eg queuing and short stacking).
Likelihood Factor (LF)	The Likelihood Factor is a factor of the likelihood of an incident at a level crossing.

Likelihood Bands	The ALCAM Likelihood Factor score in conjunction with Likelihood Bands are used to indicate the likelihood of an incident at the site (High / Medium / Low) based on the exposure of each individual rail vehicle, road vehicle or pedestrian, which can then be used to assist in the determination of whether treatment is likely to be required at a particular level crossing.
LXM	The Level Crossing Management System (Microsoft Access data base).
NTC	National Transport Commission – Lead transport regulatory reform nationally to meet the needs of transport users and the broader community for safe, efficient land transport policies, laws and practices.
RLCG	Rail Level Crossing Group – Australian strategic group with a strategic objective to reduce the likelihood of crashes and near misses at Australian rail level crossings.
SCOT	Standing Committee on Transport under the Australian House of Representatives which oversees transport issues across NSW including those issues associated with railway level crossings.

APPENDIX A

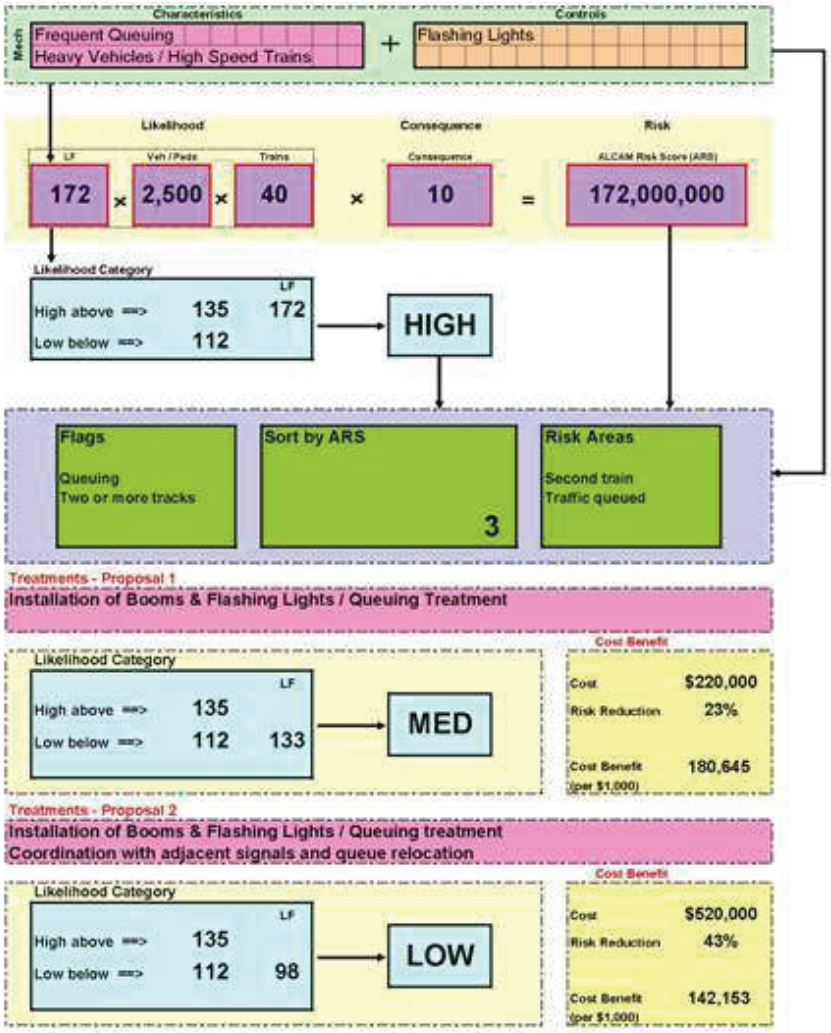
The diagram below illustrates the flow of information for a typical passive level crossing. It shows a selection of the main inputs and outputs of the level crossing as well as the critical figures which make up the comparative ALCAM Risk Score. It also shows two proposals and their effects on the ALCAM outputs as well as their cost benefit. The diagram follows the process as described on pages 3 to 8 of the main text.



APPENDIX B

The diagram below illustrates the flow of information for a typical active level crossing. It shows a selection of the main inputs and outputs of the level crossing as well as the critical figures which make up the comparative ALCAM Risk Score. It also shows two proposals and their effects on the ALCAM outputs as well as their cost benefit. The diagram follows the process as described on pages 3 to 8 of the main text.

ALCAM Example - Typical Active Site



APPENDIX C

Road Level Crossings – Characteristics, Controls & Accident Mechanisms

Level Crossing Characteristics

- Effectiveness of equipment inspection and maintenance
- Longest approach warning time
- Proximity to intersection control point
- Proximity to siding/shunting yard
- Proximity to station
- Possibility of short stacking
- Number of lanes
- Vulnerability to road user fatigue
- Presence of adjacent distractions
- Condition / Visibility of traffic control at level crossing
- Distance from advance warning to level crossing
- Conformance with Australian Standards (AS 1742.7)
- Heavy vehicle proportion
- Level of Service (vehicle congestion)
- Queuing from adjacent intersections
- Road traffic speed (approach speed 85th percentile)
- Train volume - two way (high / low)
- Seasonal / infrequent train patterns
- Slowest train speed at level crossing (typical)
- Longest train length at level crossing (typical)
- High Train Speed on approach to level crossing
- Number of operational rail tracks
- Condition of road surface on immediate approach/departure (not Xing panel)
- Level crossing panel on a hump, dip or rough surface
- S1 - advance visibility of level crossing from road
- S2 - approach visibility to train (vehicle approaching level crossing)
- S3 - visibility to train (vehicle stopped at level crossing)
- Road / Rail effected by sun glare
- Temporary visual impediments - sighting of level crossing / sighting of train

Level Crossing Controls

- Active control - Half boom, flashing lights / Half boom, flashing lights (Duplicated)
- Active control - Full boom, flashing lights
- Active control - primary flashing lights / primary flashing lights (Duplicated)
- Passive control - stop signs / stop signs (Duplicated)
- Passive control - give way signs / give way signs (Duplicated)
- Passive control - position markers only
- Rail operated gates at level crossing
- "Keep Clear" signs and cross hatching of level crossing
- Backing boards / LED lights
- Hump / dip advisory sign to road user
- R6-25 signage (confederate flag)
- Train speed advisory sign to road user
- Overhead mounted (mast arm) traffic control
- RX-9 Railway Width Marker Assembly

Level Crossing Controls (cont)

- SINGLE / DUPLICATED train activated advance warning (eg. flashing lights)
- SINGLE / DUPLICATED large passive advanced warning
- STANDARD passive advanced warning (W7-4, W7-7)
- Vehicle activated advance warning (eg. strobe lights)
- Passive tactile advance warning (eg. rumble strips)
- Rail-X pavement marking
- Localised public education strategies / enforcement
- Red light camera
- CCTV surveillance
- Hand signallers (flagmen)
- Public response phone number
- Reschedule train to avoid conflict
- Whistle board / location board for train
- Reduce train speed sign (to achieve S2 & S3)
- Street lighting at level crossing
- Maintenance program for vegetation etc
- Create extra lanes over level crossing - to address queuing
- Central barrier posts/median on road approach
- Address short stacking – infrastructure / alternate access
- Vehicle escape zones
- Control of level crossing (CCTV or on-site)
- Sign (active) for second train
- Detectors in level crossing conflict zone
- Queue clearance / queue relocation (Coordinate with adjacent traffic signals)
- Healthy state monitoring
- Queue relocation

Accident Mechanisms

- Competing stimuli (at the level crossing)
- Could not see traffic control
- Could not see train from road approach (S2)
- Could not see train from at level crossing (S3)
- Vandalism
- Failure (wrong side) of active control
- Failure (right side) of active control
- Shunting
- Simultaneous trains from both directions
- Level crossing control is ambiguous
- Fatigue
- Road standard / road driver expectation
- Unable to stop in time
- Vehicle stuck on tracks (infrastructure)
- Vehicle stopped on tracks (vehicle / driver behaviour)
- Traffic queued on tracks
- Long vehicle overhangs on tracks
- Racing train or misjudged train speed
- Driving through passive control without looking
- Driving through flashing lights
- Driving around boom gates

APPENDIX D

Pedestrian Level Crossings – Characteristics, Controls & Accident Mechanisms

Level Crossing Characteristics

- Effectiveness of equipment inspection and maintenance
- Shortest approach warning time
- Longest approach warning time
- Presence of adjacent distractions (visual)
- Proximity to intersection control point, siding/shunting yard, station
- Proximity to licensed establishments / special event venue
- Proximity to school, playground aged care facility
- Ambient noise level / Audibility of alarm
- Conspicuity / Visibility of traffic control at level crossing
- Volume of pedestrians
- Percentage of cyclists / wheelchairs
- Percentage of children
- Percentage of physically / sensory / intellectually impaired
- Train Volume
- Seasonal / infrequent train patterns
- Highest Train Speed at level crossing (typical)
- Longest train length (typical)
- Number of operational rail tracks
- Angle of level crossing / width of flange gap
- Condition of level crossing (fencing / path surface)
- Trains stand across level crossing
- gradients, widths and manoeuvring space of pathway/maze
- Path approach alignment
- Conformance to Australian Standards
- Visibility of train from level crossing
- Trains effected by sun glare
- Temporary visual impediments - sighting of train
- Masking of trains

Level Crossing Controls

- Swing gates
- Boom gates
- Manual Gates
- Maze
- Path only
- Visual and Audible alarm
- Signs only
- Adjacent boom gates and audio
- Adjacent visual and audio
- Adjacent boom gates and lights
- Adjacent lights
- Emergency egress with latch
- Emergency egress without latch
- Hand signallers

Level Crossing Controls (cont)

- Control of level crossing (CCTV or on-site)
- Healthy state monitoring
- Police enforcement
- Public education strategies
- Public response phone number
- Supervision of children
- CCTV monitored
- Signage advising train speed
- Signage “Level Crossing unsuitable for mobility devices"
- Sign (active) for second train
- Holding line (painted only)
- Delineation line marking (painted only)
- Tactile ground surface indicators (TGIS)
- Advanced warning signs for mobility devices/ cyclists
- Path lighting of level crossing
- Maintenance program for vegetation etc
- LED’s / Target boards
- Whistle boards
- Wing / funnel / guide fencing
- Funnel pathway
- Adjacent corridor fencing / four quadrant booms
- Change pathway alignment
- Flange Gap Filler
- Increase path width and trafficability
- Train lights
- Reduce train speed sign to achieve sighting requirements

Accident Mechanisms

- Distracted
- Did not see train
- Did not hear train
- Incapable of recognition
- Did not see level crossing
- Vandalism
- Failure (wrong side) of active control
- Failure (right side) of active control
- Simultaneous trains from both directions
- Misjudge where train would stop
- Shunting of trains
- Unable to stop in time
- Skylarking
- Caught in tracks
- Unable to cross quickly enough
- Trapped between automatic gates
- Racing train or misjudged train speed
- Ignoring warning signals / signs
- Crawling under / over wagons

Appendix 1 – ALCAM List of Priority Sites

ALCAM #	ROAD	SUBURB
1	Garfield Road	Riverstone
2	Princes Highway	Unanderra
3	Beaumont Street	Hamilton
4	Park Road	Woonona
5	Merewether Street	Civic
6	Pine Road	Fairfield
7	Bellambi Lane	Bellambi
8	Gosford Road / Rawson Road	Woy Woy
9	Creamery Road	Albion Park Rail
10	Nolan Street	Unanderra
11	Railway Parade (Street)	Corrimal
12	Bong Bong Road	Dapto
13	Belgrave Street	Kempsey
14	Bundarra Street	Blackheath
15	General Holmes Drive	Mascot
16	Liverpool Hospital	Liverpool
17	Couche Crescent / Koolewong Road Crossing	Koolewong
18	Stewart Avenue	Wickham
19	Shellharbour Road	Dunmore
20	Fern Street	Omega (Gerringong)
21	Camden Road	Douglas Park
22	High Street	Coffs Harbour
23	Shamrock Street	Hexham
24	West Dapto Road	Kembla Grange
25	Liverpool Street	Scone
26	Macquarie Street	Taree
27	Muldoon Street	Taree
28	Parramatta Road	Granville
29	Clyde Street	Islington
30	Oxley Highway	Wauchope
31	Railway Street	Wickham
32	Balfour Street / Olympic Highway	Culcairn
33	Hulbert Street	Sawtell
34	Avondale Road	Dapto
35	Bourke Street	East Richmond
36	Fernleigh Road	Wagga
37	New England Highway	Scone
38	Mulgrave Road	Mulgrave
39	Clarinda Street - Sir Henry's Drive	Faulconbridge
40	Willton Road (Maldon Creek Road)	Maldon
41	Docker Street	Wagga
42	Fairey Road	Windsor
43	Casula Road	Casula
44	Warnervale Road	Warnervale
45	Military Road	Yennora
46	Blumer Avenue	Griffith
47	Thurgoona Road	Albury
48	Ash Street	Orange
49	Fallon Street	Albury
50	Taree Road	Wingham
51	St James Road	Adamstown
52	Poplar Avenue (Leeton Truck By Pass)	Leeton
53	Range Road	Whittingham

Appendix 1 – ALCAM List of Priority Sites

ALCAM #	ROAD	SUBURB
54	Summerland Way	Koolkhan
55	Bushland Drive	Taree
56	Lansdowne Road	Kundle Kundle
57	Olympic Highway (Doddyns Street)	Junee
58	Byng Street	Orange
59	Brook Street	Muswellbrook
60	Sheep Wash Road	Calwalla
61	Dalton Street	Orange
62	Siaden Street	Henty
63	King Street	Paterson
64	Hoddle Street (Illawarra Highway)	Robertson
65	Gundagai Road	Cootamundra
66	Rosier Parade (Yankee Road)	Henty
67	Bruxner Highway	Casino
68	Landsdowne Road	Landsdowne
69	Victoria Street / Mitchell Highway	Dubbo
70	Summer Street	Orange
71	Urana Street	The Rock
72	River Street (Comboyne Street)	Kendall
73	Bullus Drive	Moree
74	Yerong Street	The Rock
75	Newell Highway (MR17)	Welcome
76	Landsdowne Road	Coopernook
77	Robert Street	Tamworth
78	Station Lane	Lochinvar
79	Summerland Way (Kyogle Road)	Namoona
80	Dandaloo Street	Narromine
81	Wheelers Lane	Dubbo
82	Canal Road	Leeton
83	Newell Highway (MR17)	Tichborne
84	Lansdowne Road	Melinga
85	Olympic Highway	Bethungra
86	Adelaide Street / Mid Western Highway	Blayney
87	Tilly Willy Street / McKay Street	Macksville
88	Olympic Highway	Illabo
89	Single Street	Werris Creek
90	Segenhoe Road	Aberdeen
91	Primrose Street	Wingham
92	Venda Road / Burley Griffin Way	Yoogali / Griffith
93	Wharf Road	Berry
94	Marquis Street	Gunnedah
95	Golden Highway / Sandy Hollow Road	Denman
96	Blumer Avenue	Griffith
97	Darling Street	Dubbo
98	Plunkett Street	Yerong Creek
99	Burley Griffin Way - West Street	Stockinbingal
100	Geordie Street	Bowenfels
101	Young Road	Bribbaree
102	Racecourse Road	Clarendon
103	Hebden Road	Ravensworth
104	Holten Drive	Broken Hill
105	Limestone Road / Sandy Creek Road	Muswellbrook
106	Olympic Highway	Tanyinna
107	Dampier Street	Bomen
108	Newell Highway	Mirrool

ALCAM #	ROAD	SUBURB
109	Fitzroy Street	Dubbo
110	North Street	Kempsey
111	Middle Folbrook Road	Nundah
112	Tip Road	Dunmore
113	Dallinger Road	Albury
114	Rothbury Road	Belford
115	Big Creek Road	Hilldale
116	Tynans Road	Table Top
117	The Escort Way	Borenore
118	Malbon Street	Bungendore
119	Level Crossing Road	Vineyard
120	Myall Park Road	Yenda
121	Brisbane Street	Tamworth
122	Newell Highway	Parkes
123	Burradoo Road	Burradoo
124	Murrimba Road	Wingelo
125	Blackshaw Road	Goulburn
126	Whitton Street	Narrandera
127	Mackays Road	Coffs Harbour
128	Mid Western Highway	Caragabal
129	Eastbank Roa	Nana Glen
130	Boothemba Road	Dubbo
131	Gwydir Highway / Alice Street	Moree
132	Hotham Street	Casino
133	Collombatti Link Road	Tamban
134	Yarrangundry Street	Uranquinty
135	Dungog Road (Clarencetown Road)	Wallarobba
136	Main Road (MR243)	Rockview
137	Yellow Rock Road	Urunga
138	Glennies Creek Road	Glennies Creek
139	New Street	Gunnedah
140	Oakhampton Road	Oakhampton
141	Dolly's Flat Road	Killawarra
142	Summerland Way	Wiangaree
143	Martins Creek Road	Martins Creek
144	Crossing Street	Griffith
145	Plough mans Lane	Orange
146	Newell Highway (MR17) / Dowling Street	Forbes
147	East Road	Gerogery
148	Ebert Street	Griffith
149	Parkes Road	Manildra
150	Mitchell Highway	Nyngan
151	Suttor Road	Moss Vale
152	Dowling Street (Stroud Road)	Dungog
153	Cootamundra Road - Ellis Street	Stockinbingal
154	Darling Street	Tamworth
155	Bentley Road	Kyogle
156	Warne Street	Wellington
157	Leeton - Griffith Road	Leeton
158	Markham Street	Armidale
159	Clergate Road	Clergate
160	Henry Street	Quirindi
161	McNabbs Lane	Coolamon
162	Parker Street	Cootamundra
163	Schnapper Beach Road	Valla

Appendix 1 – ALCAM List of Priority Sites

ALCAM #	ROAD	SUBURB
164	Goulburn Road	Perthville
165	Kings Creek Road	Wauchope
166	Maxwell Street	Wellington
167	Andersons Road	Kyogle
168	Red Lane	Koolkhan
169	Gisbourne Street	Wellington
170	Beckom Road	Beckom
171	Hall Street	Tamworth
172	Bridge Street	Forbes
173	Young Road	Milvale
174	Nandabah Street	Rappville
175	Wagga - Temora Road (TR57)	Old Junee
176	Sheraton Road	Dubbo
177	Iona Park Road	Calwalla
178	L10yds Road	Bathurst
179	Back Brawlin Road	Cootamundra
180	Mitchell Highway	Trangie
181	South Bank Road	Eungai
182	Junee Road	Temora
183	Purvis Lane	Dubbo
184	Whybrow Street	Griffith
185	Cowcumbla Street	Cootamundra
186	Eulomogo Road	Dubbo
187	Williams Crossing	Henty
188	Irrigation Way	Widgelli
189	Burrendong Way (MR573)	Apsley (Wellington)
190	Brown's Crossing Road	Macksville
191	Racecourse Road (MR86)	Dunedoo
192	Old North Road	Blandford
193	Whiley Road	Spring Hill
194	Irrigation Way	Wumbulgul
195	Golden Highway	Beni
196	Twynam Street	Temora
197	Carrs Peninsular Road	Koolkhan
198	Nowland Street	Quirindi
199	Manildra Street	Narromine
200	Tambar Springs Road	Connemarra
201	Newell Highway	Gilgandra
202	Werris Creek Road	Currabubula
203	Mangoola Road	Mangoola
204	Dennison Street	Tamworth
205	Shepards Road	Shepards Siding
206	Barmedman Road	Bribbaree
207	Parkes - Orange Road	Bumberry
208	Temora Road	Cootamundra
209	Public Road (Saleyards)	Dubbo
210	Johnson Creek Road (Tereel Road)	Wards River
211	Boorowa Road	Cunningar
212	Mitchell Highway	Trangie
213	Trahairs Lane	Bomen
214	Single Street (North)	Werris Creek
215	Borenore Road / Amaroo Road	Borenore
216	Neuhaus Lane	Yerong Creek
217	Oakey Forest Road	Lithgow
218	Bundook Road	Bulliac

ALCAM #	ROAD	SUBURB
219	Nash Street	Parkes
220	Phillips Street	Gloucester
221	Lake Street	Ganmain
222	Marsden Road	Wirrinya
223	Camira Creek Yard	Camira Creek
224	Woodward Road	Orange
225	Mogriguy Road	Mogriguy / Eumungerie
226	Tracey Street / Trunkey Road	Georges Plains
227	Mt Marsh Road	Whiporie
228	Ogilvie Street	Denman
229	Macedone Street	Griffith
230	Blaxland Street	Parkes
231	Cemetery Lane	Whittingham
232	Cowabbie Street	Coolamon
233	Mongogarie Road	Leeville
234	Baird Street	Culcairn
235	Kiewa Street / Parkes Road	Manildra
236	Warral Road (Behtremere Road)	Warral
237	Molong Street / Orange Road	Manildra
238	Huntly Road	Spring Hill
239	Off Muscle Creek Road	Grasstree
240	Yellow Rock Road	Raleigh
241	Garema Pinnicle Road (South End)	Garema
242	Henry's Lane	Moorland
243	Mt George Station Yard	Mt George
244	Mangoola Road	Mangoola
245	Cudal / Manildra Road / Boree Street	Manildra
246	River Street	Narrandera
247	McKellar Road	Yanco
248	Gurrendah Road	Breadalbane
249	Golden Highway (MR84)	Dunedoo
250	Dunwoodie Street	Kendall
251	Condobolin Road	Parkes
252	Mangoola Road	Mangoola
253	Castlereagh Highway	Mendooran
254	Fountaindale Road	Robertson
255	Rosemount Road	Denman
256	Mendooran Road	Broklehurst
257	Illabo	Illabo
258	Jacks Road	Gloucester
259	Meryla Street	Robertson
260	Narrandera - Leeton Road	Yanco
261	Polaris Street	Temora
262	Lowes Creek Road	Quipolly
263	Rossglen Road	Rossglen
264	Mirari Road	Kilbride
265	Perryman's Lane	Table Top
266	Burley Griffin Way - Stockinbingal to Temora Road	Springdale
267	Samuel Street	Wellington
268	Charles Street	Wellington
269	Rylstone Road / Bylong Valley Way	Sandy Hollow
270	Fry Street	Grafton
271	Wyalong Road	Quandialla
272	Dunedoo Road / Golden Highway	Beni
273	Cowra Road / Grenfell Road	Forbes

Appendix 1 – ALCAM List of Priority Sites

ALCAM #	ROAD	SUBURB
274	Kamilaroi Highway	Curlewis
275	Coolamon Street	Ariah Park
276	Ettamogah Road	Albury
277	Yarrandale Road	Dubbo
278	Merriwa Road	Willow Tree
279	Caragabal Road	Quandialla
280	Brolgan Road	Brolgan
281	McCourt Road (North Fork)	Moss Vale
282	Woods Road	Craven
283	Bathurst Street	Forbes
284	Leeville Station Road	Leeville
285	Liamena (MR86)	Dunedoo
286	Barbigal Road/Beni Street	Wongarbon
287	Albany Street	Berry
288	Harley Hill Road	Berry
289	Victoria Street	Temora
290	Bathampton Road	Wimbledon
291	Moonagee Street / Mitchell Highway	Nyngan
292	Carroll Street	Gunnedah
293	Brolgan Road	Parkes
294	Greghamstown Road	Blayney
295	Station Street	Gulgong
296	Halls Creek Road	Murrurundi
297	Crowthers Road	Stratford
298	Old South Road	Cullarin
299	Broadway Road	Jerrawa
300	Coralville Road	Moorland

Appendix E

March 2012 Level Crossing Waiting Times Survey

MONDAY

Level Crossing Delays at Adamstown
Monday 5 March 2012
Single Train Movement - Type of Train

Passenger		Freight		Loaded Coal		Empty Coal		Other		Double Train Movement		Triple Train Movement	
Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds
3	52	6	2	7	24	5	22	4	38	5	34	9	28
3	44	2	38	6	45	6	38	2	3	4	2	7	57
4	6	3	45	11	33	5	33			5	55		
2	26	5	26	7	19	3	27			4	9		
2	24	5	0	1	45	4	30			8	36		
3	4	3	38	9	25					7	11		
3	25	2	38	9	12					3	45		
2	20	5	38	6	55					5	32		
1	30	4	10							2	14		
4	26	4	53							7	12		
3	8	9	4							7	23		
2	37	4	18							4	43		
3	30	4	58										
1	57	4	22										
2	54	3	27										
2	33												
2	22												
3	44												
2	24												
2	32												
3	34												
2	33												
2	9												
1	53												
2	30												
3	25												
2	41												
3	52												
2	0												
2	51												
2	1												
1	39												
2	59												
3	39												
2	33												
2	7												
1	48												
2	10												
3	43												
1	44												
2	15												
1	25												
1	26												
1	31												
4	17												
1	38												
3	50												
1	27												
2	52												
1	27												
2	49												
4	56												
2	5												
1	50												
3	34												
1	48												
1	49												
2	22												
2	48												
1	39												
3	21												
1	28												
1	27												
4	3												
1	47												
2	5												
3	33												
1	38												
3	15												

Total	69		15		8		5		2		12		2
											24		6
145	2174	63	417	56	258	23	150	6	41	61	316	16	85
2.101	0.525	4.2	0.463	7	0.538	4.6	0.5	3	0.342	2.542	0.219	2.667	0.236
	2.626		4.663		7.538		5.1		3.342		2.761		2.903
2	38	4	40	7	32	5	6	3	21	2	46	2	54
	181.194		69.945		60.304		25.5		6.684		66.264		17.418

Average Delay Per Train (Minutes) — Single Train Movements 3.471 — Multiple Train Movements 2.789

All Train Movements 3.312

TUESDAY

Level Crossing Delays at Adamstown
Tuesday 6 March 2012
Single Train Movement - Type of Train

Passenger		Freight		Loaded Coal		Empty Coal		Other	
Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds
3	10	4	39	7	20	2	44	2	6
1	54	6	2	8	19	9	40	4	11
1	59	4	10	2	46	5	13		
2	12	4	18	6	52	3	1		
3	19	6	53	8	33	4	53		
1	39	5	11	11	27				
2	3	3	36	6	38				
4	0	8	36	6	34				
2	48	4	15	9	44				
2	21	3	52	4	41				
4	2	5	39						
2	45	5	57						
3	15								
1	55								
3	33								
6	12								
2	22								
1	49								
2	45								
1	57								
1	58								
2	11								
3	51								
2	8								
2	43								
1	59								
4	8								
2	38								
2	0								
2	50								
1	57								
3	41								
2	11								
2	45								
2	8								
1	43								
3	10								
1	49								
1	59								
1	30								
3	23								
1	43								
1	29								
1	36								
1	31								
1	37								
1	58								
3	16								
2	5								
1	52								
1	52								
2	7								
3	29								
1	46								
2	48								
1	39								
3	43								
1	44								
3	2								
2	51								
2	18								
3	28								
1	40								
2	1								
2	7								
3	41								
2	42								
4	19								
2	26								
4	20								
3	27								

Double Train Movement		Triple Train Movement	
Minutes	Seconds	Minutes	Seconds
6	14	8	59
6	29		
7	52		
3	21		
2	53		
4	29		
6	19		
7	14		
7	42		
4	32		
4	46		
3	18		
8	50		
4	57		

Total	71		12		10		5		2
146	2239	57	368	67	354	23	151	6	17
2.056	0.526	4.75	0.511	6.7	0.59	4.6	0.503	3	0.142
	2.582		5.261		7.29		5.103		3.142
2	35	5	16	7	17	5	6	3	9
	183.322		63.132		72.9		25.515		6.284

	14		1
	28		3
71	476	8	59
2.536	0.283	2.667	0.328
	2.819		2.995
2	49	3	0
	78.932		8.985

Average Delay Per Train (Minutes) — Single Train Movements 3.512

Multiple Train Movements 2.836

All Train Movements 3.352

WEDNESDAY

Level Crossing Delays at Adamstown
Wednesday 7 March 2012
Single Train Movement - Type of Train

Passenger		Freight		Loaded Coal		Empty Coal		Other	
Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds
3	55	4	35	7	13	7	53	2	34
4	8	6	47	8	41	4	10	4	33
4	7	7	46	11	4	7	29		
2	42	5	6			5	15		
2	33	4	34						
2	35	5	28						
2	15	5	22						
2	29	5	53						
4	24	4	40						
2	3	7	49						
2	29	5	50						
3	56	1	15						
3	5	3	42						
2	37	3	16						
2	51	4	13						
4	21	2	38						
2	53	5	32						
1	55								
3	30								
2	57								
1	51								
1	49								
1	45								
2	14								
3	48								
3	13								
2	5								
3	7								
3	47								
2	59								
1	49								
4	31								
1	27								
1	58								
2	9								
3	9								
2	32								
1	30								
1	29								
1	55								
8	14								
1	27								
3	55								
1	33								
1	59								
1	44								
4	7								
3	5								
3	54								
9	21								
1	54								
1	58								
3	8								
3	48								
1	44								
2	10								
2	26								
1	39								
3	58								
2	1								
1	45								
3	56								
2	32								
4	5								
3	45								

Double Train Movement		Triple Train Movement	
Minutes	Seconds	Minutes	Seconds
7	6	5	52
4	6	4	56
4	35		
6	49		
9	12		
9	6		
8	53		
6	18		
3	50		
9	7		
5	45		
10	16		
5	40		
2	42		
10	23		
13	43		

Total	65		17		3		4		2
155	2160	75	566	26	58	23	107	6	67
2.385	0.554	4.41	0.555	8.667	0.322	5.75	0.446	3	0.558
	2.939		4.965		8.989		6.196		3.558
2	56	4	58	8	59	6	12	3	33
	191.035		84.405		26.967		24.784		7.116

	16		2
	32		6
110	451	9	108
3.438	0.235	1.5	0.3
	3.673		1.8
3	40	1	48
	117.536		10.8

Average Delay Per Train (Minutes) — Single Train Movements 3.674

Multiple Train Movements 3.377

All Train Movements 3.586

THURSDAY

Level Crossing Delays at Adamstown
Thursday 8 March 2012
Single Train Movement - Type of Train

Passenger		Freight		Loaded Coal		Empty Coal		Other		Double Train Movement		Triple Train Movement	
Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds
3	34	4	37	7	18	4	7	2	23	5	57	8	23
3	41	4	53			9	0	2	37	7	26		
3	49	4	1			7	31	2	45	14	18		
2	37	4	12			5	11	3	9	2	32		
2	19	5	46			5	51			3	23		
3	51	3	18							8	0		
4	22	3	24							6	12		
2	50	3	15							4	49		
2	18	1	36							9	34		
2	53	3	22							9	49		
4	36	6	13							4	35		
2	11	2	38							11	15		
4	4	1	41							4	9		
1	51	7	22							6	55		
3	11	3	37										
2	28												
1	27												
2	36												
2	0												
1	56												
1	43												
2	33												
2	19												
2	4												
1	36												
1	48												
3	13												
1	43												
1	47												
3	2												
1	31												
1	30												
2	17												
2	35												
1	36												
1	27												
2	3												
2	13												
3	26												
1	40												
1	57												
2	48												
2	40												
2	3												
2	14												
1	31												
2	22												
4	1												
2	4												
1	50												
3	10												
1	49												
1	56												
2	30												
2	16												
2	17												
3	27												
1	28												
2	23												
2	23												
2	16												
3	38												
1	56												
2	3												
2	36												
4	45												
2	40												
3	49												
2	50												
3	44												
2	2												
4	7												

Total	72		15		1		5		4		14		1
											28		3
149	2115	53	415	7	18	30	100	9	114	92	414	8	23
2.069444	0.489583	3.533333	0.461111	7	0.3	6	0.333333	2.25	0.475	3.285714	0.246429	2.666667	0.127778
	2.559028		3.994444		7.3		6.333333		2.725		3.532143		2.794444
2	34	4	0	7	18	6	20	2	44	3	32	2	48
	184.25		59.91667		7.3		31.66667		10.9		98.9		8.383333

Average Delay Per Train (Minutes) — Single Train Movements 3.031

Multiple Train Movements 3.461

All Train Movements 3.135

Level Crossing Delays at Adamstown

FRIDAY

Friday 9 March 2012

Single Train Movement - Type of Train

Passenger		Freight		Loaded Coal		Empty Coal		Other		Double Train Movement		Triple Train Movement	
Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds	Minutes	Seconds
3	48	3	20	8	37	5	0	2	33	7	6		
4	11	3	13	4	58	6	55	2	42	6	54		
2	37	5	19	8	15	4	23	2	43	5	12		
2	46	5	13	6	37	6	42			2	14		
3	29	3	41	7	36					3	35		
3	41	4	53							7	59		
2	37	4	11							4	31		
2	42	5	19							5	51		
4	17	1	37							7	17		
1	46	6	42							3	46		
3	30	4	3							5	25		
1	46	5	43							6	25		
3	28	1	34							2	16		
1	33	7	2							4	52		
2	2	3	55							9	55		
2	27	1	59							6	57		
1	49	2	39							6	5		
1	59	6	24							11	31		
1	27	5	17							5	2		
1	35												
3	47												
1	38												
2	12												
3	40												
1	37												
3	42												
1	27												
1	34												
2	26												
2	14												
2	2												
2	28												
1	46												
1	58												
4	17												
1	33												
3	49												
2	26												
2	11												
3	49												
3	18												
3	50												
2	2												
1	54												
4	8												
3	32												
2	10												
1	49												
2	2												
4	0												
2	26												
2	10												
2	27												
3	41												
3	16												
1	54												
2	1												
4	5												
1	43												
3	48												
3	2												
1	31												
2	6												
3	27												

Total	64		19		5		4		3		19		0
											38		0
139	1888	73	544	33	183	21	120	6	118	103	593	0	0
2.171875	0.491667	3.842105	0.477193	6.6	0.61	5.25	0.5	2	0.655556	2.710526	0.260088	0	0
	2.663542		4.319298		7.21		5.75		2.655556		2.970614		0
2	40	4	19	7	13	5	45	2	39	2	58	0	0
	170.4667		82.06667		36.05		23		7.966667		112.8833		0

Average Delay Per Train (Minutes)

Single Train Movements 3.364

Multiple Train Movements 2.971

All Train Movements 3.251