Coal Dust Management Plan

Coal Loss Management Project
February 2010

QRNetwork

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QR Network Executive General Manager statement

The completion of this Coal Dust Management Plan symbolises a significant shift in the way QR Network and our coal supply chain partners manage train-related coal dust in Central Queensland. Not only does it reflect a strong commitment to operate in an environmentally safe way through our neighbouring communities, but it also acknowledges that we have listened to the concerns of the communities where we operate.

This coordinated response to the community's concerns has resulted in a number of benefits. The planned implementation of the Coal Dust Management Plan will benefit the community in minimising coal dust, and it will provide potential long-term commercial benefits to the Central Queensland coal supply chain, saving millions of dollars through improved environmentally friendly practices.

QR Network has installed ambient air monitoring units throughout the three Central Queensland rail systems, improved our coal dust complaints management process, conducted extensive laboratory and field tests to identify dust sources and mitigation methods, aligned our commercial agreements with the planned mitigation methods, and worked closely with the coal supply chain to identify improved operational practices that will minimise dust from trains.

The Coal Dust Management Plan could not have been achieved without the collaborative input of our coal supply chain partners, who have made significant contributions to the plan and are actively implementing changes to their operations in order to mitigate coal dust.

QR Network remains hopeful that this unified approach to managing coal dust from trains in transit will be sustained. This will help to ensure we achieve the vision of cleaner coal solutions for the people of Queensland, the environment, and the coal industry.

Mike Carter

EGM

QR Network

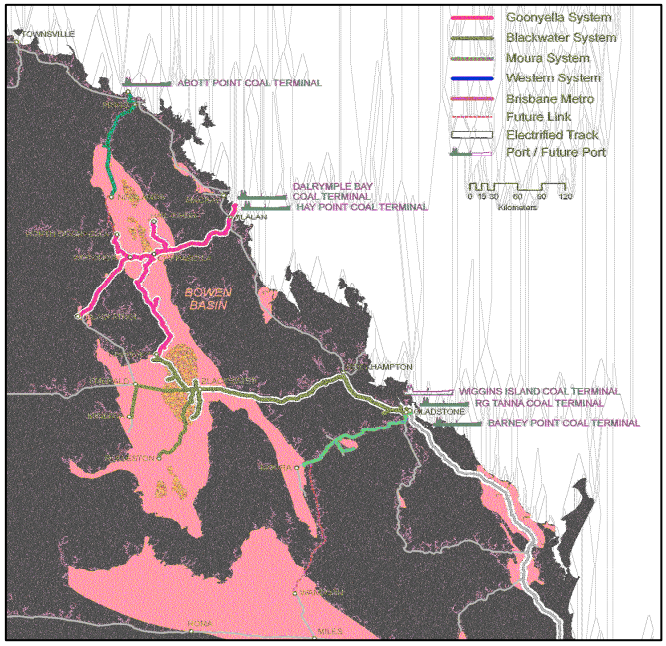
Glossary

QR	Queensland Rail
CDMP	Coal Dust Management Plan
DERM	Department of Environment and Resources
EE	Environmental Evaluation
TEP	Transitional Environmental Program
CCEF	Coal Chain Environmental Forum
QRC	Queensland Resource Council
GPCL	Gladstone Port Corporation Limited
DBCT	Dalrymple Bay Coal Terminal
PM10	Particulate Matter less then 10 microns
TSP	Total Suspended Particles
NPI	National Pollutant Inventory

1 Introduction

1.1 Background

The Coal Dust Management Plan (CDMP) has been prepared by QR Network on behalf of QR Limited (QR) and the Central Queensland coal supply chain in response to community concerns regarding dust from coal trains. On 2 July 2007, the Department of Environment and Resource Management (DERM formerly EPA) issued the Chief Executive Officer at QR with an Environmental Evaluation (EE) Notice under section 323 of the *Environmental Protection (EP) Act 1994* with respect to coal dust from trains in the Central Queensland coal Goonyella, Blackwater and Moura rail systems connecting to the Ports of Gladstone and Hay Point. QR Network submitted the EE on 31 March 2008, and DERM, under s326 of the EP Act accepted the report.



Central Queensland Coal Systems

1.2 Relationship between the EE and the CDMP

The CDMP outlines a range of actions and strategies available across the Central Queensland (CQ) coal supply chain to address coal dust – specifically at load-out facilities, with coal train operators, rail network managers and at coal terminals (domestic and export). QR Network's role has been to identify the range of mitigation approaches and provide an overview of how participants can seek to mitigate coal dust depending on the extent of nuisance caused. Mitigation strategies within the CDMP address coal dust from the sources and activities identified in the EE.

The EE identified coal dust can be emitted from the following sources in the coal rail system:

- coal surface of loaded wagons
- coal leakage from doors of loaded wagons
- wind erosion of spilled coal in corridor
- residual coal in unloaded wagons and leakage of residual coal from doors
- parasitic load on sills, shear plates and bogies of wagons.

The EE recommended the following mitigation methods could be implemented in the Goonyella, Blackwater and Moura rail systems:

- coal surface veneering using dust suppressants at the load-out
- improved coal loading techniques at the load-out to reduce parasitic load on horizontal wagon surfaces and reduce over-filling hence spillage during transport
- load profiling to create a consistent surface of coal in each wagon, to be implemented at the load-out
- improved unloading techniques to minimise coal ploughing and parasitic load in wagons.

The recommendations from the EE formed the basis for a Transitional Environmental Program (TEP) that DERM requested QR Network undertake in cooperation with the Central Queensland coal supply chain. The CDMP is a key deliverable of the TEP. QR Network Pty Ltd (QR Network) has responsibility within QR Limited for the coordination of the development of this plan.

1.3 Purpose and scope of the Coal Dust Management Plan

The purpose of this CDMP is to provide a high level plan for the CQ coal supply chain participants to manage coal dust from trains transporting coal on the Goonyella, Blackwater and Moura rail systems connecting to the ports of Gladstone and Hay Point. This document is a voluntary guide intended to inform coal supply chain practices.

Rather than a comprehensive implementation plan for every coal supply chain participant, the CDMP reflects the range of actions available across the coal supply chain to address dust. Indicative timeframes for implementation are considered in the CDMP for existing operations as well as considerations for new operations – to the extent that DERM directly regulates any such activities, the established processes and approved DERM parameters will continue to apply.

Ultimately, implementation of dust mitigation strategies will be influenced according to the:

- prevailing business conditions at the time the decision is required
- effectiveness of the particular mitigation approaches given technology and cost constraints
- timeframes required to implement mitigation strategies
- overall strategy undertaken given the specific characteristics underlying the contribution to dust
- consideration of the impact on other supply chain participants.

It is important to note that across the coal supply chain, participants recognise the need for industry Best Practice to mitigate coal dust. The CDMP highlights that isolated responses by single entities will not provide the best outcome and that a whole-of-supply chain approach should provide the most effective mitigation approach to coal dust.

1.4 Development of the Coal Dust Management Plan

The CDMP has been developed in cooperation with the relevant coal supply chain participants, as requested by DERM. A Coal Chain Environmental Forum (CCEF) was formed to lead the strategic development of the plan; and a subset working group of the CCEF also provided operational level input to the plan.

Due to the many variables that impact individual supply chain participants, the CDMP outlines a high level plan surrounding a number of potential mitigation methods. These mitigation methods may not be

applicable to all supply chain participants due to a variety of factors (such as location or operational characteristics). As such, the responsibility rests within individual organisations to indentify the appropriate approaches for their operational requirements.

Input has also been provided by Katestone Environmental and Introspec Consulting in specialist areas. These include the design and development of monitoring stations, laboratory testing of coal types and veneering product effectiveness, and field studies of factors influencing the effectiveness of coal wagon surface veneering in mitigating coal dust.

A review of Environmental and Safety Risk Assessments has set objectives for the overall CDMP. This will allow the supply chain participants to make dust mitigation decisions for the short, medium and long term in the best interest of the environmental requirements of the community and establish a process of continuous environmental improvement.

2 Central Queensland Coal Supply Chain Statement

The CQ coal supply chain plays a significant role in the transportation of coal to satisfy domestic and global market needs. A strong coal industry benefits surrounding communities by contributing to the regional economy. This shared interest between the community and the coal industry ensures there is a viable future in terms of creating employment, establishing economic opportunities and protecting environmental values for local communities.

The CQ coal supply chain is working collaboratively by recognising coal dust mitigation requires active participation by all sectors including: coal producers, coal train operators, rail network managers and coal terminals (domestic and export).

The commitment is to undertake a transparent process to identify effective actions, monitor dust from trains and implement a range of effective dust mitigation strategies including operational procedures, application of new techniques and training to improve awareness and reduce the risk of environmental harm while ensuring this aspect of the coal supply chain network continues to have community support.

3 Coal Chain Sector Statements and Summaries

This section of the CDMP has been developed by each coal supply chain sector to reflect its intent and commitment to coal dust mitigation. It has been compiled through a combination of direct input and outputs of a number of working groups convened as part of the CDMP consultation process. A more detailed view of this information is contained in the industry sector statements and summaries following this section and the associated appendices that detail the coal dust mitigation activities.

3.1 Coal Chain Sector Contributors

- **Coal Producers:** Represented by Queensland Resources Council
- **Coal Train Operators:** Coal train operators include QR National and Pacific National
- **Rail Network Managers:** The sole rail network manager is QR Network
- **Capricornia Domestic Coal Terminals:** Capricornia domestic coal terminals include NRG Gladstone Operating Services (Gladstone Power Station); RIO Tinto Aluminium Yarwun; Queensland Alumina Limited (QAL); Stanwell Power Station, Cement Australia
- **Goonyella Export Coal Terminals:** Goonyella export coal terminals include Hay Point Services and Dalrymple Bay Coal Terminal
- **Capricornia Export Coal Terminals:** Capricornia export coal terminals include: RG Tanna and Barney Point represented by Gladstone Port Corporation.

3.2 Coal Producers Sector Statement and Summary

3.2.1 Introduction

Coal producers delivering on the Goonyella, Blackwater and Moura rail systems to the Ports of Gladstone and Hay Point have been represented in the compilation of this document by the Queensland Resources Council (QRC). The Queensland coal industry is linked to each of the supply chain participants (directly or indirectly), in that they provide services for the transportation of coal to customers, and therefore the Queensland coal industry is a key stakeholder in addressing coal dust.

QRC focuses its Environmental Policy on promoting and facilitating sustainable environmental outcomes throughout the resources sector. QRC leads the Queensland resources sector in negotiating responsible environmental outcomes with all stakeholders in the development of policies, legislation, regulations, guidelines and procedures that contribute to the protection of environmental values.

QRC provides strategic leadership by:

- promoting responsible environmental management processes
- promoting continual improvements in environmental performance
- facilitating stakeholder communication
- establishing an industry position on environmental issues
- working with key stakeholders to achieve an equitable legislative framework.

In implementing the objectives of the environmental policy and guidelines, the QRC encourages and supports its member companies to:

- plan all activities and develop environmental strategies in the context of sustainable development, within which three dimensions are intrinsically linked: ecological, economic and social
- consider compliance with applicable laws, regulations and standards, and utilise relevant guidelines for the protection of the environment, as the minimum requirement
- adopt the best practical means to minimise adverse impacts on environmental values.

3.2.2 Coal Producers Statement

The Queensland coal industry is committed to mitigating coal dust from coal trains by working with members of the coal supply chain to optimise effective operational and economical mitigation practices. This includes:

- identifying and implementing effective mitigation initiatives to address coal dust
- conducting research and development into operational and technological solutions
- where practical, implementing operational and technical solutions
- complying with environmental policies, legislation, regulations, guidelines and procedures set by Government.

In order to mitigate coal dust at mines, mitigation methods have been identified for implementation, review or further development.

3.2.3 Coal Producers Summary

The table below summarises the current status as well as short, medium and long term activities of the mine sector of the Central Queensland coal industry relating to coal dust mitigation in rail transport. It also identifies improvements for new facilities and infrastructure.

Existing Infrastructure or Facilities	
Current	▪ development of an effective veneering strategy in close consultation with QR Network ▪ veneer spray stations at three load-outs ▪ sill brushes ▪ profile design of chute loaders – including skirts ▪ effective loading procedures ▪ community liaison and communication ▪ procedural review and operational training
Short/Med. Term <3 yrs	▪ implementation of an effective veneering strategy in collaboration with QR Network – including veneer spray stations at appropriate locations ▪ development of standards informed by monitoring processes and coal type testing (to be progressed in consultation with QR Network and the coal industry) ▪ veneer spray stations at additional sites ▪ profiling chute loaders with skirts ▪ wagon loading practices ▪ load out facility infrastructure ▪ appropriate coal moisture regulating systems ▪ internal communications ▪ coal type testing for dustiness
Long Term > 3yrs	▪ load out facility infrastructure ▪ batch weighing load-out system ▪ load-out chute retrofitting
New Facilities	
▪ veneer spray stations consistent with veneer strategy ▪ profiling chute loaders with skirts ▪ appropriate coal moisture regulating systems ▪ batch weighing load out system ▪ coal type testing for dustiness ▪ load out facility infrastructure	

Table 3.1.2: Coal Producers Coal Dust Mitigation Activities

3.3 Coal Train Operators Sector Statement and Summary

3.3.1 Introduction

Currently there are two coal train operators - QR National Coal and Pacific National - providing coal haulage services in Central Queensland.

3.3.2 Coal Train Operators Sector Statement

Both coal train operators are committed to minimising dust from coal trains. They will achieve this through a number of strategies including:

- working with other members of the coal supply chain to identify and implement coal dust mitigation initiatives
- conducting research and development into operational and technological solutions that will assist in the suppression of coal dust from coal trains on Central Queensland rail lines
- where practical, implementing operational and technical solutions.

These activities are in line with the coal train operators' ongoing commitment to the reduction of coal dust from trains.

3.3.3 Coal Train Operators Sector Summary

The table below summarises the current status as well as short, medium and long term activities of the coal train operator sector of the Central Queensland coal industry relating to coal dust mitigation in rail transport. It also identifies best practice for new facilities and infrastructure.

Existing Infrastructure or Facilities	
Current	▪ train speed indicators ▪ operational procedures ▪ operator procedural training ▪ internal environmental awareness ▪ community liaison and communication
Short/Med. Term <5 yrs	▪ wagon design
Long Term > 5yrs	▪ wagon replacement ▪ ECP brakes (QR National only)
New Facilities	
▪ New wagons	

Table 3.2.2: Coal Train Operators Dust Mitigation Strategy and Activities

3.4 Rail Network Manager Sector Statement and Summary

3.4.1 Introduction

Currently there is one rail network manager, QR Network, providing coal rail infrastructure and services in Central Queensland.

3.4.2 Rail Network Manager Sector Statement

QR Network is committed to working with industry to address train-related coal dust management issues identified in the EE. The following risk mitigation strategies will be implemented once agreement with the Central Queensland coal supply chain has been achieved:

- Change current mine loading methodologies at each loadout to deliver a veneered 'garden bed profile' to the wagon surface (e.g. edge of loaded coal 100mm below cant rail, levelled top, loading methodology to maximum volume [taking into consideration axle load] and minimises coal spillage outside the wagon, optimum moisture content, install veneering spray station at mine loadout, spray the loaded coal surface with approved veneers and integrate veneering with loading methodology.
- Mines and operators are to ensure their direct employment and contract loaders adhere to the changing loading requirements.
- Develop system-wide veneering supply contracts to achieve consistency of product and encourage a competitive environment (nominally two-three years before a retender on a system-wide basis).
- Amend the commercial arrangements between QR Network and mines to reflect these changed loading and monitoring methodologies
- Introduce reasonable system monitoring to allow the coal supply chain to adopt a continuous improvement approach over the next three to five years.

Existing monitoring under the regulated environment will be increased with cameras, and other measurement devices. A key issue is that monitoring and recording of data be on a central website so that mines can confirm all are adhering to this veneering process.

3.4.3 Coal Chain support

Formal agreement to this risk mitigation opportunity has not been received from the coal supply chain. QR Network is currently seeking the voluntary agreement of the supply chain to a non-regulated approach to the letting of system-wide veneering contracts, audit and reporting arrangements, and amendment to the current and future commercial arrangements (Transfer Facility Licences (TFL)).

3.4.4 Implementation

Discussions are continuing with a number of mines with a target to implement veneering, loading, and profiling methodologies at 14 priority mines in Central Queensland by Q4 2010/Q1 2011.

A reasonable implementation target for all mines to adopt these revised dust mitigation strategies could be 2013.

QR Network has an important role in the coal chain to mitigate coal dust by improving infrastructure and operating practices through commercial agreements and strong relationships. In addition, QR Network is well placed to initiate activities to improve mitigation of coal dust from corridor coal, one of the sources identified in the EE. QR Network is also committed to monitoring coal dust from trains and the management of community complaints related to the rail transportation of coal as well as ongoing community consultation.

The table below is an indicative timeline for veneering implementation.

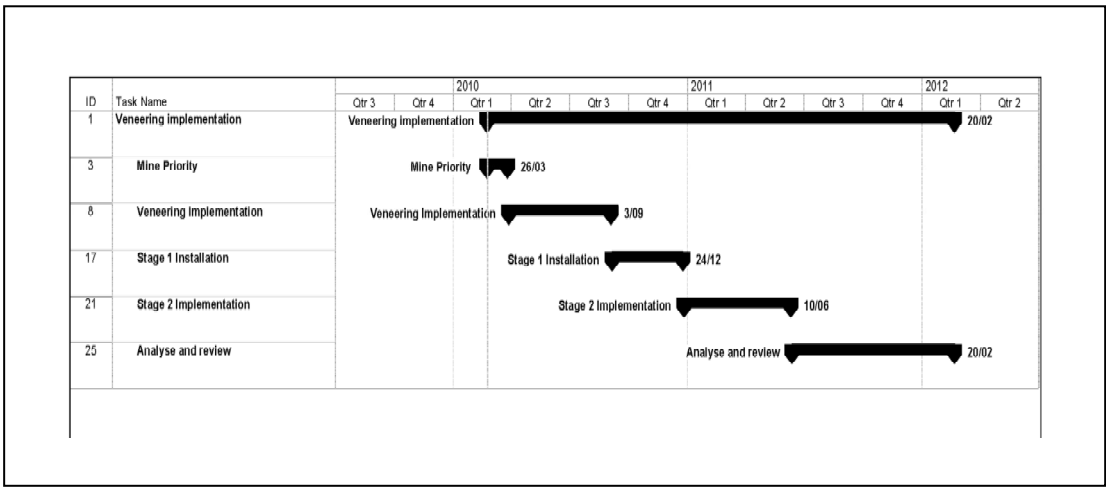


Table 3.3.2 Veneering Implementation Timeline

3.4.3 Rail Network Manager Summary

The table below summarises the current status as well as short, medium and long-term activities, for the mitigation of coal dust from trains in transit in Central Queensland. It also identifies potential improvements for new facilities and infrastructure.

Existing Infrastructure or Facilities	
Current	▪ coal dust removal (ballast cleaning) ▪ complaints management ▪ community liaison ▪ internal education & awareness ▪ weighbridges to monitor loading ▪ coal dust monitoring systems ▪ commercial agreements
Short/Med. Term <3 yrs	▪ ballast spoil management ▪ corridor coal and spoil removal ▪ corridor barriers and vegetation ▪ commercial agreements
Long Term > 3yrs	▪ corridor barriers & vegetation ▪ review monitoring systems
New Facilities	
▪ liaison with local government ▪ commercial agreements ▪ corridor barriers and vegetation	

Table 3.3.3: QR Network's Coal Dust Mitigation Strategy and Activities

3.5 Coal Terminal Sector Statements and Summaries

3.5.1 Introduction

Domestic and export terminals currently provide coal terminal services in Central Queensland. Domestic terminals include:

- NRG Gladstone Operating Services (Gladstone Power Station)
- RIO Tinto Aluminium Yarwun
- Queensland Alumina Limited (QAL)
- Stanwell Power Station
- Cement Australia.

Export terminals include:

- Hay Point Services
- Dalrymple Bay Coal Terminal
- Gladstone Port Corporation.

Due to the site specifications in infrastructure and operational practices at each terminal, not all identified mitigation methods can be applied to all terminals. For example, some terminals take delivery of minimal amounts of coal compared to others. These variables have been acknowledged where possible; however, it will be the responsibility of the individual terminal to identify the correct mitigation method for its site.

3.5.2 Capricorn Domestic Terminals Sector Statement

The domestic coal terminals of Central Queensland are committed to reducing coal dust from coal trains by working with other members of the coal supply chain to optimise cleaner coal transport practices. The domestic terminals are concerned with coal that is carried back inside the wagons due to incomplete unloading and fugitive coal that collects on the outside of wagons due to unloading practices.

3.5.3 Capricorn Domestic Terminal Sector Summary

The table below summarises the current status as well as short, medium and long term activities of the Capricorn domestic terminal sector. It also identifies potential improvements for new facilities and infrastructure.

Existing Infrastructure or Facilities	
Current	▪ modify existing unloading procedures ▪ operator procedural training ▪ monitor empty wagons ▪ community liaison and communication ▪ increase environmental awareness internally
Short/Med. Term <3 yrs	▪ wheel washing ▪ wagon vibrators ▪ moisture levels of coal in transit ▪ wagon sill brushes
Long Term > 3yrs	▪ implement a coal dust suppressant system at QAL (empty wagons)
New Facilities	
▪ wagon cleaning station ▪ improved unloading pit design	

Table 3.4.2: Capricorn Domestic Terminals Coal Dust Mitigation Strategy and Activities

3.5.4 Goonyella Export Terminal Sector Statement

The Goonyella system coal terminals are committed to supporting the rail provider's actions to reduce coal dust from coal wagons in transit and are working with other members of the coal chain to optimise dust minimisation practices. The export terminal sector will focus efforts with the aim to mitigate residual and parasitic coal dust sources at the train terminal interface.

Due to the site specifications in infrastructure and operational practices at each terminal, not all identified mitigation methods can be applied to all terminals. These variables have been acknowledged where possible. However, it will be the responsibility of the individual terminal to identify the correct mitigation method applicable to its operation.

3.5.5 Goonyella Export Terminal Sector Summary

The table below summarises the current status as well as short, medium and long term opportunities available to the export terminal sector of the Central Queensland coal industry relating to coal dust mitigation in rail transport. It also identifies future opportunities that can be considered for the introduction of new facilities and infrastructure.

Existing Infrastructure or Facilities	
Current	▪ operator procedural training ▪ hopper level/train speed indicators ▪ internal environmental awareness ▪ wheel washing (DBCT only)
Short/Med. Term <3 yrs	▪ wagon unloading practices ▪ wagon vibrators ▪ residual coal monitoring
Long Term > 3yrs	▪ wagon unloading practices
New Facilities	
▪ wagon cleaning facility ▪ unloading facility infrastructure	

Table 3.4.4: Goonyella Export Terminals Coal Dust Mitigation Opportunities

3.5.6 Capricorn Export Terminal Sector Statement

The Capricorn export coal terminals are committed to the reduction of coal dust from coal wagons in transit and are working with other members of the coal chain to optimise dust minimisation practices. The Capricorn export terminal sector will focus mitigation of the residual and parasitic coal dust sources at the train terminal interface.

3.5.7 Gladstone Port Corporation Limited (GPCL) Summary

The following document provides an overview of the processes and systems that are in place that will enable GPCL to achieve outcomes based on a specified mitigation activity / strategy.

These activities and strategies are based on benchmarking studies conducted by the GPCL in 2007 / 2008. The objective of these studies was to:

- review current processes which generate dust (including rail infrastructure related sources) at GPCL coal terminals. This review included the effectiveness of current control measures
- assess the current procedures at GPCL which are used to operate equipment, monitor dust generation and provide feedback to adjust procedures
- benchmark GPC's operation against other coal terminals and similar operations to gauge how well GPC's terminals compare worldwide with other facilities

- recommend strategies to reduce dust generation at operating coal terminals. These strategies include the mitigation of residual and parasitic coal dust sources at the train terminal interface.

Based on the outcomes of these studies, GPCL's approach to mitigating residual and parasitic coal dust sources is based on eight key areas:

Training and Communication:

1. Internal Training / Environmental Awareness
2. Community Liaison and External Communication

Procedural and Infrastructure:

3. Wagon Unloading Practices
4. Hopper Level / Train Speed Indicators
5. Remnant Coal Monitoring
6. Remnant Coal Elimination / Removal - Wagon Interior
7. Remnant Coal Elimination / Removal – Wagon Exterior
8. New Unloading facility infrastructure

Appendix G outlines GPCL's commitment to these eight areas. Additional details can be accessed through GPCL systems / statutory documentation as referenced in this document.

4 Transitional Environmental Program (TEP) elements

4.1 Performance Monitoring and Reporting

An innovative monitoring system to identify dust levels from trains has been developed by QR Network in consultation with Katestone Environmental and EcoTech. Three monitoring stations are installed at: Marmor on the Blackwater system; Shillings Lane near Calliope on the Moura system, and Mindi near Coppabella on the Goonyella system.

The system measures the opacity of the air across the top of moving coal trains as they pass the monitoring stations. A co-located weather station records wind direction and speed; relative humidity and rainfall to determine the influence of weather on dust incidents.

Train movement information is used to identify trains and their origin as they pass the monitoring station.

Marmor Monitoring Station Installation

Monitoring and Weather Station

The output from the three monitoring stations can be related to coal dust complaints received via the Community Connect Line.

Monitoring reports from Katestone Environmental will be forwarded to QR Network. QR Network will provide this information to coal producers and DERM. The reports will include data on increased opacity readings attributable to train movements. This data will provide an opportunity for establishing an acceptable standard of particle levels with a targeted mitigation response to dusty coal. This will allow QR

Network, in partnership with DERM, to conduct and assess the level of performance on an annual assessment.

Monitoring for coal dust is part of the regulated activities conducted by the Rail Manager. Over the next five years additional type and scope of monitoring may need to be developed to monitor the effectiveness of risk mitigation techniques implemented by the coal supply chain. This may require the development of different monitoring technologies.

4.2 Complaints Management

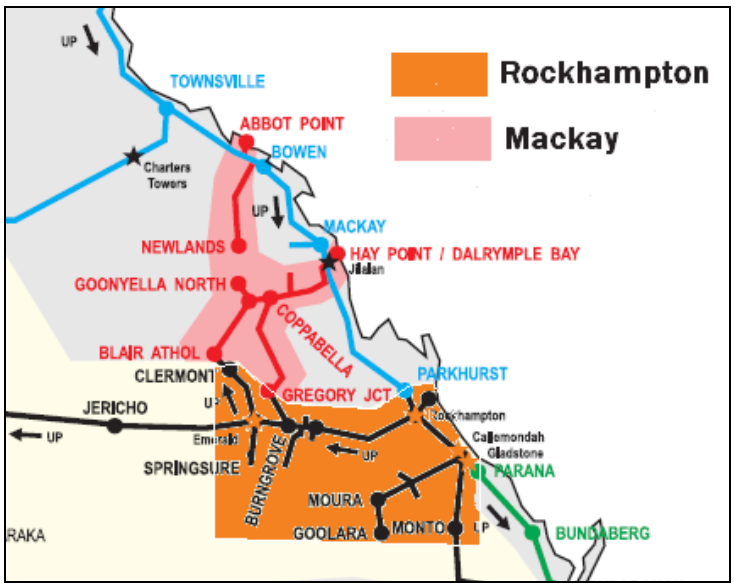
QR Network has established a Community Connect Line (1800 050 480) in Central Queensland for the community to lodge train-related coal dust complaints. Callers from the Goonyella system will be directed to the Mackay Control Room, while callers from the Blackwater and Moura systems will be directed to the Rockhampton Control Room.

After details of the call are recorded in the Control Room they are passed on to the relevant area for handling and resolution. This management system is an interim step towards a longer term solution to be implemented by QR to manage a broad range of complaints. The long-term solution will include a call centre capability and a new purpose built complaints management IT system. The interim solution includes:

- initial recording of the call details
- sending the details of the complaint to the regional QR Network manager
- identification of which train has been the source of the complaint and informing them of the event
- recording of the complaint in a central complaints database
- delivery of an appropriate and timely response
- liaison with the complainant
- closure of complaint.

Industry-wide train-related coal dust complaints in Central Queensland can be directed to the Community Connect Line.

Recording coal dust complaints in a central database allows for regular reports to be compiled determining complaint rates. Over time, community satisfaction with industry coal dust mitigation of train-related coal dust is likely to be reflected in the number of verified complaints received.



Community Connect Line Coverage

4.3 Communication approach

The delivery of an industry-wide CDMP represents a significant supply chain achievement. One that outlines appropriate strategies to mitigate dust from trains in transit; reported by those who have been directly impacted.

Given the community interest in future dust management from trains, the finalisation of the Coal Dust Management Plan and the proposed mitigation methods should be communicated to these interest groups.

Communication Plan

QR Network has a continuous improvement plan to meet environmental best practice and the community's environmental expectations. Through the continuing support of the Queensland coal supply chain and the communication plan these objectives will be met. The following outlines a high-level targeted stakeholder communication plan to be implemented after the CDMP has been accepted by DERM.

Community approach:

- a targeted communication approach to registered complainants, Central Queensland councils, community leaders, and special interest groups
- referral to the Coal Loss Management project webpage for further information
- face-to-face briefs on an 'as requested' basis.

5 Research and Development

5.1 Laboratory Tests on further Coal Types

Laboratory testing has been undertaken at the Tunra facilities at the University of Newcastle of an additional ten coal types using veneering products tested in the Environmental Evaluation. This has resulted in a report by Katestone Environmental and Introspec Consulting titled *Wind Tunnel Tests for the Evaluation of Selected Surface Veneer Products to Reduce Dust Lift-off from the Surface of Coal during Rail Transport*.

The findings and recommendations are:

- All four surface veneer products achieved a high level of performance when applied to the further ten coal types at the sample moisture content. The moisture content for each coal type was provided by the relevant coal producer as the typical moisture content when loaded to trains at the mine loading station. It is noted that these moisture contents were at or near the relevant DEM.
- Samples with nil treatment were exposed for only one minute due to the high rate of dust lift-off. It is noted that a very high reduction in dust lift-off was achieved by the application of surface veneer treatment for all ten coal types.
- A second series of wind tunnel tests was conducted as a preliminary investigation of the effect of "as loaded" coal moisture content on the dust lift-off reduction performance of surface veneer application when applied to two typical thermal unwashed coal types.
- It was noted that there was a significant reduction in the effectiveness of surface veneer performance when the coal moisture level was reduced from 75% DEM to 30% DEM. However, even at low moisture levels, the dust lift-off following surface veneer treatment was significantly lower than the dust lift-off observed with nil treatment.
- Further tests on two thermal unwashed coal types were conducted to determine if dust lift-off from samples with moisture content at 30% DEM could be reduced if the coal surface was treated at the rail loading bin by pre-wetting the coal surface with water at 1.0 litre/m2, prior to application of surface veneer treatment.
- From observation of two typical coal types it is concluded that coal wagons should be loaded with coal moisture content at or near the relevant DEM to achieve the most satisfactory and cost-effective surface veneer performance.

5.2 Field Trials on potential impact of Slip Failure

The field trials to investigate the potential impact of slip failures in the coal on the overall effectiveness of dust control have resulted in the report titled *Review of potential coal surface changes and other factors which may reduce the performance of surface veneer treatment during rail transport*. These trials and the subsequent report have been finalised by Katestone Environmental and Introspec Consulting. The recommendations of the report are listed below.

5.2.1 Basis for recommendations

The following recommendations are based on the conclusions that:

- despite movement in the coal surface having the potential to break the veneer surface seal and expose untreated coal, veneering is still effective
- wagon vibration and other operational impact forces are factors that may result in slip failure or other movement of the surface of coal during transport
- some coal load profiles may contribute to slip failure or other movement of the surface of coal during transport
- coal load profiles are related to the loading method and load-out equipment.

5.2.2 Recommendations

- Surface veneer should be applied to coal surfaces transported by above rail operators in Queensland to achieve a reduction in dust emission.
- Further review of changes to the coal surface during rail transport should be conducted when a number of mines with diverse profiles implement veneering. This will allow review of the operational effectiveness of veneering on a range of profiles to be observed.
- Following the further review, recommendations should be prepared on coal load profiles that best minimise changes to the coal surface. Preliminary coal load profile recommendations determined from the study program completed to date include:
    - Slope angle of coal loads should be reduced to below the angle of repose
    - The length of sloping coal surfaces should be reduced to a minimum
    - Near flat coal surfaces are preferred.
- These recommendations on coal load profile should be adopted unless further observations indicate a review.
- Discussion should be conducted with suppliers of train loading equipment regarding achievement of a coal profile which minimises slip failure and other changes to the coal surface.
- In line with emerging coal port terminal requirements under which coal should be loaded with the moisture level at optimum moisture content, all coal types should be loaded with moisture level above the relevant dust extinction moisture level, to improve surface veneer performance and reduction in surface movement.
- Laboratory tests being conducted as part of the TEP should be referred to for more detail of the effect of low moisture content on the performance of surface veneer treatment. If coal is loaded below the relevant dust extinction moisture level, the surface may need a two stage application to pre-wet the surface before application of the surface veneer.
- Procedures should be developed for regular random inspection of surface veneer application systems to ensure that systems are fully operational and achieve full coverage of the coal surface in all wagons.

5.3 PM_{10} Study

The Transitional Environmental Program required a study for: "The provision of information that proves the assumption made in the environmental evaluation report that concentrations of PM_{10} {particulate matter less then 10 microns} are less than 50% of recorded concentrations of TSP".

This resulted in a report titled *QR Transitional Environmental Program Point 6, Ratio of TSP to PM_{10}*. This study and the subsequent report has been finalised by Katestone Environmental.

The key outcomes of the report are:

A literature review has been conducted that has considered activities and localities that are likely to have sources of dust emissions with a similar mode of dust emissions to that which causes emissions from rail wagons carrying coal, namely, wind erosion:

- A study conducted on behalf of QR at Callemondah found that the proportion of dust collected beside tracks carrying coal trains was, for all measurements, less than 30% and typically less than 15%. This supports the conclusion that coal trains contribute a relatively small amount to measured dust levels adjacent to the railway and indicates that coal trains are unlikely to have contributed substantially to measured TSP levels.
- An ACARP funded study found that the ratio of concentrations of PM_{10} and TSP adjacent to trucks hauling coal was between 28% and 41%.
- Emission factors that have been published by the NPI for activities that have a similar mode of emissions to coal suggest a ratio of PM_{10} to TSP concentrations of 50%.
- Measurements of PM_{10} and TSP in the Hunter Valley in New South Wales and at Hay Point in Queensland, where wind erosion of coal and overburden are likely to be substantial contributors to ambient levels of dust, have found that the ratio of PM_{10} and TSP concentrations was 27% to 40%.
- Particle size distribution information derived from samples of coal from Queensland coal mines indicate PM_{10} to TSP ratios from 26.9% to 45% within samples of coal.
- A study of dust suppressants by Jameson (1984) using a wind tunnel with a wind speed of 9.9 m/s (35.6 km/hr) found a ratio of 44% between the PM_{10} and TSP that was collected at the end of the wind tunnel.

Katestone Environmental Pty Ltd KE0807622 Queensland Rail November 2009 Page 2.

Overall, this study concludes that the ratio of PM_{10} to TSP concentrations in dust emissions from wagons carrying coal is likely to be less than 50%. This is supported by a range of measurements in locations where the mode of dust emissions is dominated by wind erosion, the mode responsible for emissions from coal wagons.

5.4 Kwik-Drop Door Leakage Estimate

Aurecon Hatch was engaged to investigate coal leakage from the doors of coal wagons in Central Queensland. The resulting report Coal Leakage from Kwik-Drop Doors is summarised below.

5.4.1 Summary of Findings

The investigation into coal leakage from Kwik-Drop doors, a discussion regarding potential contributing factors and an assessment of potential mitigation options has yielded the following conclusions:

- The average coal loss from the Kwik-Drop doors is estimated to be 1,900 t and 1,800 t per annum for the Goonyella and Blackwater systems respectively, at an average of 300 kg per train or 0.0027% of coal transported annually.
- The preliminary upper bound estimate of 400 tonnes of coal dust per annum emitted from the ballast (originating from the doors), presented in Section 4.2 of the Environmental Evaluation remains unchanged. The estimated 6% contribution of coal from the doors to coal emitted from the rail corridor is an upper bound estimate, with the average figure likely to be less than 6%.
- There appears to be no correlation between:
    - door loss and door clearance (within the range of clearances 3-8 mm), attributable to the fact that the greater than 60% of coal loss sampled consisted of particles less than the nominal design door clearance (2-3 mm)
    - door loss and distance travelled
    - particle size distribution and door clearance.
- Coal loss appears to be related to coal source (not specifically coal type), which could be influenced by any number of variables, including but not limited to:
    - coal type and rank
    - meteorological conditions
    - moisture content
    - washed/unwashed coal
    - proportion of fines
    - longitudinal travel forces
    - wagon design (door design and wagon stiffness)
    - distance of travel
    - track geometry and condition
    - wagon condition and maintenance.
- The trials and results achieved their intended purpose, to provide preliminary data regarding door loss, and another trial of a similar nature will not alter the order of magnitude of results or the correlations that have been determined.
- The Kwik-Drop door system requires a clearance in the doors to ensure their correct, safe and reliable operation, meaning that seals/bushes would have to be retrofitted to doors to achieve complete sealing – previous trials by QR using non-metallic bushes proved unsustainable.
- A practicability and cost-effectiveness assessment that was presented in Section 9 of the Environmental Evaluation, updated to include retrofitting door seals/bushes, shows that this mitigation option is, in particular, not a cost-effective solution for mitigating coal dust emissions.

- A practicability and cost-effectiveness assessment that compares various door loss mitigation options, while preliminary in nature and reliant on assumptions, suggests that field testing is conducted to determine the effects that shunt and buff (longitudinal forces) and wagon flexing have on coal loss through the doors.
- Improve training for loading operators to ensure that best practice techniques are employed.
- Laboratory tests and field work is conducted to explore the potential impacts of coal arching in wagons and door loss.
- Laboratory tests and field work is conducted to explore the potential impacts of longitudinal shunt and buff forces in wagons and door loss, allowing predictions of any improvements due to the introduction of the driver assistance program.
- Laboratory tests and field work is conducted to explore the potential impacts of wagon flexing and door loss.
- "Smart" trigger technology being introduced at the ports is used to target and adjust doors that are shown to be out of normal operating parameters.

5.4.2 Recommendations:

- Improve training for loading operators to ensure that best practice techniques are employed.
- Laboratory tests and field work is conducted to explore the potential impacts of coal arching in wagons and door loss.
- Laboratory tests and field work is conducted to explore the potential impacts of longitudinal shunt and buff forces in wagons and door loss, allowing predictions of any improvements due to the introduction of the driver assistance program.
- Laboratory tests and field work is conducted to explore the potential impacts of wagon flexing and door loss.
- "Smart" trigger technology being introduced at the ports is used to target and adjust doors that are shown to be out of normal operating parameters.

5.5 ACARP and CSIRO Research

5.5.1 Mapping the distribution of coal related dust along railway lines and port facilities

The CSIRO Exploration and Mining division, with the support of QR Network, has submitted a proposal to ACARP to use similar technology to that used in the Western Australian iron ore industry, to map coal dust distribution along and around rail corridors.

Objectives

The project's objectives are to map the distribution of dust along railway lines and areas surrounding the port handling facility, and to determine the composition of the dust.

Benefits

- a method that delivers spatially-comprehensive data that is currently not available by other techniques
- a cost effective method of rapidly monitoring dust levels
- the method developed will be applicable to other Gladstone railway lines and is applicable to ports handling similar commodities.

This project will support the future use of data acquired by new hyperspectral satellites to be launched in the next five years making it possible to frequently and routinely map dust providing monitoring capabilities compatible to those performed currently using other methods.

Outcomes

- Address a gap in knowledge on the distribution of dust along railway lines and adjacent to the handling facilities at Gladstone. This information will help the community and regulators understand the extent of dust and QR and GPA develop enhanced management strategies for addressing community and regulatory concerns.
- Provide information on the composition of dust especially at locations such as Barney Point where there are a variety of dust sources.
- Provide a baseline of current status of dust levels before new facilities are built. There are forecasts of huge growth a decade into the future.

Contact:

Cindy Ong
CSIRO Exploration and Mining phone:
Ph: (08) 6436 8677
Email: Cindy.Ong@csiro.au

5.5.2 Reduction of Carry-back and Coal Spillage in Rail Transport Project (ACARP C15071)

The CSIRO has developed a carry-back detection system which is installed at RG Tanna Dump Station No 3. This system automatically generates alerts for control room operators whenever the volume of material residing within unloaded wagons exceeds a selected threshold. The carry-back information will serve to identify those wagons harbouring carry-back and require intervention.

The project produced a report: Reduction of Carry-back and Coal Spillage In Rail Transport (CSIRO Report Number: P2008/2423 Revision Date: 29 October 2008)

Contact:

Chad Hargrave
CSIRO Exploration and Mining
Ph: (07) 3327 4423,
Email: chad.hargrave@csiro.au

6 References

Connell Hatch (2008), "Final Report Environmental Evaluation of Fugitive Coal Dust Emissions from Coal Trains Goonyella, Blackwater and Moura Coal Rail Systems", report to Queensland Rail Limited http://www.qrnetwork.com.au/Libraries/Coal_Loss_Management_Project/Coal_Loss_Management_Project_Environmental_Evaluation.sflb?download=true

Cope DL and Bhattacharyya KK, (20010, "Fugitive coal Dust Emissions in Canada" A report from D. Cope Enterprises to The Canadian Council of Ministers of the Environment (CCME)

CSIRO (2007), "Analysis of Carry back at the RG Tanna Coal Terminal (Draft), Exploration and Mining Report" P2007/893

SITMARS – Department of natural resources and Mines (2008), "Gladstone Airborne Coal Dust Monitoring: Complete Report", QR National Coal

CSIRO (2008) Reduction of Carry-back and Coal Spillage In Rail Transport (Report Number: P2008/2423 Revision Date: 29 October 2008)

Katestone Environmental (2009) QR Transitional Environmental Program Point 6, Ratio of TSP to PM10

Katestone Environmental and Introspec Consulting (2009) Review of potential coal surface changes and other factors which may reduce the performance of surface veneer treatment during rail transport.

Katestone Environmental and Introspec Consulting (2009) Wind Tunnel Tests for the Evaluation of Selected Surface Veneer Products to Reduce Dust Lift-Off from the Surface of Coal During Rail Transport.

Appendices

Appendix A: Draft TEP Notice

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Notice

Environmental Operations

Prepare a draft transitional environmental program

This statutory notice is issued by the administering authority pursuant to section 332 of the Environmental Protection Act 1994, *to advise you of a decision or action.*

Queensland Rail
305 Edward Street
Brisbane
QLD 4000

Your reference :

Our reference : GLT 1099

Attention: John Scherer,

Re: Draft transitional environmental program for the mitigation of dust emissions from coal trains operating on the Blackwater, Moura and Goonyella rail systems

The Environmental Protection Agency has decided to require you to prepare, or commission the preparation of, a draft transitional environmental program. This requirement is because coal trains being operated by Queensland Rail Limited on rail lines connecting coal mines in the Bowen Basin and Callide Basin with the ports of Gladstone, Dalrymple Bay and Hay Point are causing, or may cause, unlawful environmental harm.

The draft transitional environmental program must be submitted to the Environmental Protection Agency at the address at the end of this notice by 8 August 2008.

The program is required on the grounds that the administering authority is satisfied that the number, nature and location of dust complaints received by it indicates that trains carrying coal on the Blackwater /Moura and Goonyella systems are a source of dust, and that dust is causing, or has the potential to cause, environmental nuisance and hence environmental harm.

The program must address the following matters:

1. QR Limited shall develop and implement a risk-based coal dust management plan detailing short, medium and long term strategies for minimising coal dust emissions from the key dust sources highlighted in the report entitled 'Environmental Evaluation of Fugitive Coal Dust Emissions from Coal

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www.epa.qld.gov.au ABN 87 221 158 786

Queensland Government
Environmental Protection Agency
Queensland Parks and Wildlife Service

trains" This shall include but not be limited to:

- Veneering of coal in transit
- Profiling of coal loads in wagons
- Pilot trials for wagon washing

This coal dust management plan should be developed in consultation with all affected stakeholders.

2. Undertake further work to provide a more reliable estimate of coal leakage from Kwik-Drop doors.
3. Conduct further laboratory tests and field trials to explore the effectiveness of veneering for a broad range of coal types and to investigate the potential impact of slip failures in the coal on the overall effectiveness of dust control.
4. Implement on-going monitoring at strategic points within the Goonyella, Blackwater and Moura Systems to augment the baseline information collected by way of the environmental evaluation and to quantify the improvement in coal dust emissions as mitigations measures are implemented. The measurement technique adopted needs to:
   a. provide a reliable measure of the magnitude of coal dust emitted from coal trains during transport;
   b. transparently link measurements of coal dust with specific trains and/or characteristics of their hauls.
   c. Link measurements of coal dust to specific meteorological conditions and locations to allow a comprehensive response to any future query or complaint about coal dust.
5. QR Limited, in consultation with stakeholders including the EPA, develop a system of managing and responding to any future complaints about dust in a timely and professional manner which is closely linked to the monitoring system describe under point 4.
6. The provision of information that proves the assumption made in the environmental evaluation report that concentrations of PM_{10} are less than 50% of the recorded concentrations of TSP.

The transitional environmental program must include a schedule of action points, key milestones and outputs with scheduled completion dates.

Fees apply for the assessment of a draft transitional environmental program and any subsequent annual returns. The fees are outlined in the attached operational policy *Transitional Environmental Program (TEP) fees*.

You may apply to the EPA for a review of this decision within 10 business days of receiving this Notice. You may also appeal against this decision to the Planning and Environment Court.

Information outlining the review and appeal processes under the *Environmental Protection Act 1994* is included with this Notice. This information is intended as a guide only. You may have other legal rights and obligations

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Notice

Prepare an environmental management program

Should you have any queries in relation to this Notice, Don Arnold of the EPA on telephone 4971 6500 would be happy to assist you.

JMSL	10 - 06 - 2008
SIGNATURE	DATE

John Sherriff
District Manager Central Coast
Delegate
Environmental Protection Agency

Enquiries:
Central Coast Region
P.O. Box 5056
Gladstone
Ph. 4971 6500
Fax. 4972 1993

Appendix B: Coal Producer Sector Coal Dust Mitigation Activities

Veneer spray stations

Description	Apply veneer suppressant to the surface of loaded coal wagons that binds the surface particles together to provide a membrane that is resistant to dust lift off. The suppressant can be applied to the surface of the loaded wagons using a spray system.
Potential contribution to coal dust management	Reduces dust lift off from trains in transit.
Commercial, operational and other benefits	Potential to improve safety and rail system throughput.
Status	Once assured of the efficacy, practicality and economics of this approach, industry is committed to working with QR network to develop a coherent veneering strategy for appropriate implementation. A number of mines have chosen to undertake veneering at selected sites as a means of mitigating coal dust.
Future potential and indicative timelines	Veneering remains an ongoing effective mitigation measure for industry and QR Network. The delivery and timing will be determined in close consultation between industry, DERM and QR Network.

Wagon loading practices and profiling

Description	Review and modify existing train loading procedures to capture revised and new work practices adopted during the review of existing work practices. The load-out operator should commence loading so the first drop of coal impacts on the leading inside wall of the wagon, avoiding the kwik-drop doors. The profile must be a flat top surface and spillage over the ends and sides must be avoided.
Potential contribution to coal dust management	The benefits of correct loading practices and profiling significantly improves the effectiveness of veneering, reduces the amount of parasitic coal that drops off during transit and reduces residual coal at unloading terminals.
Commercial, operational and other benefits	Potential to reduce 'coal arching' and 'sticky coal' incidents where the coal becomes difficult to unload at the terminal that may result from the loading method
Status	Existing operational review processes will be used with the inclusion of coal dust mitigation improvements
Future potential and indicative timelines	Ongoing operational improvements to better manage loading procedures

Coal type testing for dustiness

Description	Determine the dustiness of coal types being produced to assist identification of those more likely to cause nuisance.
Potential contribution to coal dust management	This allows preventative measures to be effectively implemented before the train causes nuisance.
Commercial, operational and other benefits	Coal dustiness is a property that is required to be known for terminals to better manage unloading and handling.
Status	Some coal types have been tested during the EE and subsequent research.

Future potential and indicative timelines for implementation	An effective coal testing system would provide feedback to mines when their coal is likely to generate dust. This will provide a useful flag to those coals (and those conditions) when dust risk increases.

Load-out facility infrastructure

Description	Improvements in mitigating coal dust can be achieved by influencing the design and operation of mine load-out infrastructure. Examples include mine load-out equipment and mechanisms that contain the coal within the wagon, load accurate volumes of coal, weigh incoming and outgoing wagons, minimise dumping coal onto the wagon doors, and veneer and profile the loaded coal. Some infrastructure changes are too costly and complex to retrofit onto existing load outs. These should be implemented as generational infrastructure changes over the long-term by influencing the design of new mine load-outs.
Potential contribution to coal dust management	New infrastructure that includes coal dust mitigation activities would deliver the benefits of those activities as mentioned herein.
Commercial, operational and other benefits	Opportunity to implement production improvements that better manage coal loading and supply chain management.
Status	This will be a mine-by-mine decision based on a range of variables.

Coal moisture regulating system

Description	A system that measures the moisture content of coal and automatically adds water to maintain an optimum moisture level (whilst not attracting moisture penalties from customers)
Potential contribution to coal dust management	Reduces dust and improves veneer effectiveness
Commercial, operational and other benefits	Improved dust control before and after transit, in load out and terminal conveyors and stockpiles
Status	This will be a decision based on a number of variables.

Sill brushes

Description	Brushes located at a suitable position to remove excess coal on wagon sills immediately after the coal is loaded.
Potential contribution to coal dust management	Minimises parasitic coal that dislodges and falls off the wagon during transit
Commercial, operational and other benefits	Minimises loss of product coal by allowing dislodged coal to be returned for loading.
Status	Currently at some mines. This will be a mine-by-mine decision based on individual site needs.

Internal communications

Description	Upon publication of this plan, mines will raise general awareness of the initiatives being undertaken to reduce coal dust inside their organisations.
Potential contribution to coal dust management	Awareness of the issue will enable staff at all levels to conceive of new initiatives (including improved operating procedures) to help minimise coal dust.
Commercial, operational and other benefits	Improving knowledge sharing and internal relationships within an organisation

Status	Awareness of issue currently at management level and across some specialist positions. Broader education will commence after publication of the CDMP.

Batch weighing load out systems

Description	Batch weighing systems accurately control the quantity of coal loaded into each wagon, resulting in optimised loads.
Potential contribution to coal dust management	Provides the ideal volume of coal into the wagon minimising dust lift off and spillage in transit.
Commercial, operational and other benefits	Greater control of load weight during loading
Status	This will be a commercial decision based on a number of variables.

Appendix C: Coal train operators Sector - Coal Dust Mitigation Activities

Coal train operators have identified and are actively pursuing a number of initiatives to mitigate coal dust. These procedural and technical initiatives are detailed below.

Train Speed Indicator (QR National Coal only)

Description	The TSI utilises an on-board receiver unit to provide advice on optimum train speed to the driver based on wagon class and coal supply.
Potential Contribution to Coal Dust Management	Helps with providing consistent coal surface in loaded wagon
Commercial, Operational and Other Benefits	Optimises loading processes
Status	Operational throughout Goonyella, Blackwater and Moura systems
Future potential and indicative timelines	NA
Targets and measures	NA
Responsibilities and accountabilities	It is the responsibility of the coal train operator to maintain operational use of TSI to continue managing the loading and unloading process
Reporting	Progress reports available on request
Decision Criteria (if not in place)	NA

Overloaded Wagon Charge (QR National Coal and Pacific National)

Description	QR National Coal and Pacific National's standard haulage agreement contains a provision for charging for overloaded wagons
Potential Contribution to Coal Dust Management	The provision is designed to encourage load out facility operators to load wagons to the designed tolerance. Overloaded wagons have a greater potential to generate coal dust as coal drops off the top of the wagon in transit.
Commercial, Operational and Other Benefits	Benefits include the operator's ability to recover any wagon overload charges imposed by QR Network. Overloaded wagons also increase the wear and tear on wagons, posing an increased maintenance cost. Large amounts of coal dust on the track increases the potential for derailments, which poses a substantial threat to safety. Coal train operators are committed to environmental sustainability and minimising community impact and this initiative supports this.
Status	Wagon Overload Charge is in place for all standard haulage agreements (post 2004) and is a feature of all new agreements/renegotiations.
Future potential and indicative timelines	NA
Targets and measures	NA
Responsibilities and accountabilities	NA
Reporting	Progress reports available on request

Decision Criteria (if not in place)	NA

Wagon design (QR National Coal and Pacific National)

Description	Current wagon design and construction does not consciously consider coal dust emission reduction. Both coal train operators are working with their suppliers to ensure designs for new generation coal wagons seek to minimise the incidence of coal dust. Design considerations include: Reduce parasitic load on wagon sills by altering the sill design to a 'sharp' sill with no flat edge to carry coal Trailing bogie ploughs that clear ploughed coal away from the wheel reducing the likelihood of parasitic coal on wheels, springs and axles
Potential Contribution to Coal Dust Management	The design will incorporate aerodynamics to minimise the coal loss from the top of wagons.
Commercial, Operational and Other Benefits	Less ballast fouling therefore less below rail costs and less track closures giving more coal haulage.
Status	QR National Coal: Design phase Pacific National: Current wagon design includes sharper slope chutes to reduce coal hang-ups, sharp sills to minimise parasitic coal on sills and overlapping doors that reduce door leakage.
Future potential and indicative timelines	Given the current processes and procedures required for the acquisition, design, implementation, modification (including loss of utilisation of current rollingstock during modification) and manufacture of rollingstock it is difficult to provide timeframes for the coal dust mitigation procedural and technical initiatives.
Targets and measures	Future wagon design will continue to consider and implement improved coal dust mitigation measures.
Responsibilities and accountabilities	It is the responsibility of the coal train operators to influence the coal wagon manufacturers by recommending wagon design improvements
Reporting	Progress reports available on request
Decision Criteria (if not in place)	May introduce as part of agreed wagon replacement strategy

Modified Kwik-Drop-Doors (QR National Coal only)

Description	There is an opportunity to reduce door gaps by analysing, testing and implementing an overlapping door mechanism.
Potential Contribution to Coal Dust Management	Losses from the KDD are assessed to be in order of 15% of all coal loss.
Commercial, Operational and Other Benefits	Less ballast fouling therefore less below rail costs and less track closures giving more coal haulage.
Status	Research and Development
Future potential and indicative timelines	Improvements in door mechanisms will not be attempted on existing rolling stock as retrofitting costs and industry impacts are too high. However, new rolling stock can be considered for alternative door designs when an appropriate solution has been properly developed and tested.

Targets and measures	Research and development can be initiated in the medium term and implementation of new or modified kwik drop doors will occur thereafter in the long term on new rolling stock
Responsibilities and accountabilities	It is the responsibility of the coal train operator to initiate research and development into improved door design
Reporting	Progress reports available on request
Decision Criteria (if not in place)	May introduce as part of agreed wagon upgrade strategy (i.e. in accordance with economic life)

ECP Brakes (QR National Coal and Pacific National)

Description	Electronically Controlled Pneumatic (ECP) braking provides an even braking force along the coal train reducing the buff and draft longitudinal forces that vibrates wagons shaking loose parasitic coal, increasing door leakage and making consistent loading and unloading difficult.
Potential Contribution to Coal Dust Management	Smoother braking functionality should reduce coal lost through the impact of jarring and vibration.
Commercial, Operational and Other Benefits	Less ballast fouling therefore less below rail costs and less track closures giving more coal haulage.
Status	Pacific National has ECP brakes fitted on all new rollingstock. QR National Coal is currently developing a business case to consider the cost benefit of ECP braking for both new rollingstock and the potential to retrofit existing rollingstock.
Future potential and indicative timelines	The decision to install ECP brakes will be considered upon completion of the business case
Targets and measures	Implementation targets and measures will be considered after the business case is complete
Responsibilities and accountabilities	It is the responsibility of the coal train operator to implement ECP brakes based on commercial and other business factors
Reporting	Progress reports available on request
Decision Criteria (if not in place)	QR National Coal will consider ECP braking for both new and existing rollingstock. This decision will be based on the commercial viability of this initiative.

Railway Disaster Plan and Environmental Management (QR National Coal and Pacific National)

Description	Under the existing Access Agreements with QR Network, there is a requirement to undertake risk assessments and have plans to manage incidents on the network, including the requirement to support the 'recovery of site'.
Potential Contribution to Coal Dust Management	Site cleanup will support the reduction of coal dust resulting from large scale spillage.
Commercial, Operational and Other Benefits	Mitigation of risks associated with railway accidents and incidents
Status	QR National Coal is currently updating documents to a Railway Disaster Plan, incorporating the requirement for a site recovery plan.
Future potential and indicative timelines	NA

Targets and measures	NA
Responsibilities and accountabilities	The Railway Disaster Plan and Environmental Management is the responsibility of the coal train operator along with the network manager
Reporting	Progress reports available on request
Decision Criteria (if not in place)	NA

Internal Communications (QR National Coal and Pacific National)

Description	Upon publication of this plan, both operators will raise general awareness of the initiatives being undertaken to reduce coal dust.
Potential Contribution to Coal Dust Management	Awareness of the issue will enable staff at all levels to conceive of new initiatives (including improved operating procedures) to help minimise coal dust.
Commercial, Operational and Other Benefits	Opportunity for continuous improvement measures through communication between business units
Status	Awareness of issue currently at management level and across some specialist positions. Broader education will commence after publication of the CDMP.
Future potential and indicative timelines	Ongoing communication of the coal dust issue
Targets and measures	NA
Responsibilities and accountabilities	Internal communication of coal dust issues is the responsibility of the Environmental and Operational managers within the business
Reporting	Progress reports available on request
Decision Criteria (if not in place)	NA

External Communication (QR National Coal and Pacific National)

Description	Upon publication of the CDMP, advise customers and ports of our coal dust reduction initiatives and the importance of working together as an industry to minimise coal dust.
Potential Contribution to Coal Dust Management	May encourage customers and ports to work with coal train operators to reduce coal dust.
Commercial, Operational and Other Benefits	QR positioned as an environmentally aware operator.
Status	Will commence once CDMP published.
Future potential and indicative timelines	There is potential for new, as yet unrealised, improvements and further coal dust minimisation
Targets and measures	QR representation at industry and community forums
Responsibilities and accountabilities	External communication of coal dust issues is the responsibility of the Environmental and Operational managers with the business
Reporting	Progress reports available on request
Decision Criteria (if not in place)	NA

Appendix D: Network Manager Sector - Coal Dust Mitigation Activities

Coal Dust Removal from track (Ballast Cleaning)

Description	Ballast cleaning involves the mechanical removal of coal dust and other material contaminating ballast by on track Ballast Cleaning Machines (BCMs).
Potential contribution to coal dust management	The removal of the coal dust lessens the amount of coal in the rail corridor and the potential for it to be blown into neighbouring communities
Commercial, operational and other benefits	Improves availability of track capacity, increases safety by improving the track structure.
Status	This activity is currently undertaken in all central Queensland rail systems on a priority schedule.
Future potential and indicative timelines	Additional on-track BCMs may be deployed to remove coal from track ballast
Targets and measures	
Responsibilities and accountabilities	QR Network
Reporting	QR Network internal
Decision criteria (if not in place)	The criterion for undertaking ballast cleaning is based the percentage void contamination (PVC) which is a measure of the amount of coal in the ballast.

Complaints Management

Description	Community complaints on train related coal dust are managed by QR Network. This includes recording of complaints, coordinating an appropriate response and providing a reporting capability.
Potential contribution to coal dust management	Appropriate management of community complaints is likely to reduce the number of both ongoing and new coal dust related community issues.
Commercial, operational and other benefits	Reinforcement of QR as a responsible long-term member of the community.
Status	A Community Connect line has been established with an interim answering facility in Mackay and Rockhampton. Operational responsibilities have been defined within QR Network.
Future potential and indicative timelines	A call centre-based operation with a new data management system is planned for implementation within the next short to medium term.
Targets and measures	Timely response to caller's complaints.
Responsibilities and accountabilities	QR Network
Reporting	Ongoing monthly reporting to DERM of new central Queensland originated coal dust complaints related to rail transport.
Decision criteria (if not in place)	NA

Community Liaison

Description	Maintain clear and regular communication with community groups, councils, forums and individuals by listening to and discussing issues. Provide information on train-related coal dust mitigation initiatives being undertaken.

Potential contribution to coal dust management	Maintaining communication with community groups, councils and forums is likely to reduce the number of ongoing and new coal dust related community issues. This provides improved focus on solutions.
Commercial, operational and other benefits	Places QR as a responsible long-term member of the community, and provides an opportunity to manage risk
Status	Currently QR Network attends regular community forums and meets with influential community members.
Future potential and indicative timelines	Ongoing
Targets and measures	Community satisfaction and relationships.
Responsibilities and accountabilities	QR Network
Reporting	QR Network Internal
Decision criteria (if not in place)	NA

Infrastructure Liaison

Description	Infrastructure liaison describes activities related to assisting vendors to implement new equipment such as spray stations, reviewing load-out design, site visits and coordination.
Potential contribution to coal dust management	This service will assist the implementation of coal dust mitigation infrastructure.
Commercial, operational and other benefits	Integration with other infrastructure and procedural issues.
Status	This activity is currently partly undertaken by QR Network
Future potential and indicative timelines	Resources have been committed to ensure this service continues for the foreseeable future.
Targets and measures	Compliance with commercial agreements.
Responsibilities and accountabilities	QR Network
Reporting	QR Internal
Decision criteria (if not in place)	New facilities, scheduled inspections, requests for consultation from coal chain members.

Internal/External Education and Awareness

Description	Internal/External education and awareness of the management of coal dust from trains and loaders/unloaders.
Potential contribution to coal dust management	Development of a culture of awareness and responsibility for managing coal dust related issues within QR and coal supply chain that will positively influence future decision making. Operational proficiency in loading coal wagons and minimising spillage and potential slippage of load during transit.
Commercial, operational and other benefits	Improved loading competency is likely to lead to reduced coal dust and ballast and other infrastructure fouling.
Status	The role of managing train related coal dust issues is being operationalised within QR Network

Future potential and indicative timelines	Within 12 months managing coal dust related issues will be business as usual for QR Network.
Targets and measures	TBA
Responsibilities and accountabilities	QR Network
Reporting	QR Network internal
Decision criteria (if not in place)	NA

Weighbridge (Overload detectors)

Description	Weighbridge devices at coal load-outs to monitor coal loaded into wagons.
Potential contribution to coal dust management	Weighbridges enable the weight of each wagon to be determined as it is being loaded and discourages overloading which creates fugitive coal on the wagons and spillage into the rail corridor.
Commercial, operational and other benefits	Correct monitoring of wagon and train weight has significant operational and safety advantages in preventing additional impacts to infrastructure and rollingstock.
Status	A project is currently underway to address reliability of weighbridges within the central Queensland coal fields.
Future potential and indicative timelines	Loaded train dynamically weighed as a measure to prevent overloaded and spillage of coal into the corridor.
Targets and measures	All installed weighbridges operational as overload detectors.
Responsibilities and accountabilities	QR Network
Reporting	QR Network Internal
Decision criteria (if not in place)	All non-operational weighbridges are in scope for this initiative.

Monitoring Systems

Description	Monitoring systems allow dusty coal trains to be identified as well as the source load out.
Potential contribution to coal dust management	The identification of dusty coal trains can trigger appropriate mitigation actions to be undertaken.
Commercial, operational and other benefits	Ongoing reporting from the systems will allow coal dust mitigation progress to be monitored over time.
Status	A monitoring station has been installed at Marmor and is operational. Data collection and analysis is currently taking place. Two additional stations are to be installed at Mindi and Shillings Lane on the Goonyella and Moura systems respectively.
Future potential and indicative timelines	The monitoring stations will be in place by the end of the first quarter 2010. The monitoring stations will be in place indefinitely.
Targets and measures	Indication of opacity readings that can be shown to be related to coal trains.
Responsibilities and accountabilities	QR Network to provide monthly reports to DERM containing the data identifying increased opacity readings related to trains.

Reporting	Monitoring data to be provided to DERM monthly as well as internally in QR Network to compare with complaints.
Decision criteria (if not in place)	All trains on the three central Queensland coal rail systems are to be monitored.

Corridor Barriers & Vegetation

Description	Corridor barriers and vegetation provide visual and physical separation between the rail corridor and community areas. Selected ground cover vegetation can also be used to cover corridor coal.
Potential contribution to coal dust management	The provision of barriers has the potential to reduce the amount of coal dust carried outside the rail corridor. Dust from corridor coal can potentially be reduced by ground cover vegetation that acts as a covering and biding agent.
Commercial, operational and other benefits	Barriers on the edge of the rail corridor have the potential to lower the visual impact of train transport and to lessen noise.
Status	Barriers and vegetation are current options for QR Network to use in addressing identified sites requiring a dust mitigation solution.
Future potential and indicative timelines	Barriers and vegetation will remain an ongoing option for QR Network.
Targets and measures	Community satisfaction.
Responsibilities and accountabilities	QR Network
Reporting	Internal QR Network
Decision criteria (if not in place)	Dust complaint response; potential proactive activity for new rail lines; coal spillage in sensitive areas.

Commercial Agreements

Description	QR Network has commercial agreements with other members of the coal chain in which coal dust mitigation measures can be included.
Potential contribution to coal dust management	Provides a mechanism for implementing coal dust mitigation in areas where QR Network has a commercial influence.
Commercial, operational and other benefits	Having agreements in place ensures consistency in the standards of dust mitigation.
Status	Commercial agreements currently exist with a number of coal chain members.
Future potential and indicative timelines	QR Network will seek to negotiate the prescribed coal dust mitigation elements for new facilities contained in the commercial agreements.
Targets and measures	Compliance to commercial agreements will be checked at the design and commissioning stages of new facilities and on an ongoing schedule for existing facilities.
Responsibilities and accountabilities	QR Network
Reporting	Internal QR Network
Decision criteria (if not in place)	Renewal or review of existing contracts and new contracts.

Corridor Coal and Spoil Removal

Description	Coal and spoil removal includes the removal of coal dust from infrastructure and raw coal from the rail corridor.
Potential contribution to coal dust management	Decreases the amount of coal available to be blown into neighbouring community areas.
Commercial, operational and other benefits	Improved rail infrastructure performance; recycling of coal. Reclaim ballast and reduce impact on environment.
Status	Coal and spoil removal is an option that QR Network could use to address areas within the rail corridor deemed to require coal dust mitigation.
Future potential and indicative timelines	Coal and spoil removal will remain an ongoing option for QR Network.
Targets and measures	Community satisfaction; infrastructure performance
Responsibilities and accountabilities	QR Network
Reporting	Internal QR Network
Decision criteria (if not in place)	Response to complaint. Coal spillage near residential area; failed infrastructure.

Ballast Spoil Management

Description	Ballast spoil management includes the removal of ballast from the rail corridor as it is being replaced, by attaching specialised wagons and infrastructure to ballast cleaning operations.
Potential contribution to coal dust management	Reduction of the quantity of coal in the rail corridor available to be blown into neighbouring community areas.
Commercial, operational and other benefits	Potential recycling of ballast. Reduces impact on environment.
Status	This initiative is in the planning stage.
Future potential and indicative timelines	This initiative is planned to be in place in 3-5 years subject to capital approvals.
Targets and measures	
Responsibilities and accountabilities	QR Network and QR Services
Reporting	Internal QR Network
Decision criteria (if not in place)	Associated with PVC for ballast cleaning.

Liaison with Local Government

Description	Liaison with local government includes discussion regarding the potential siting of new rail corridors and the suitability or otherwise of adjacent residential development.
Potential contribution to coal dust management	Potential to avoid community proximity to coal trains and joint solutions to existing issues.
Commercial, operational and other benefits	Improved community amenity
Status	Relationship building with local governments in central Queensland

Future potential and indicative timelines	Ongoing activity.
Targets and measures	Agreeable outcomes for QR Network, local government and the community.
Responsibilities and accountabilities	QR Network
Reporting	Internal QR Network
Decision criteria (if not in place)	NA

Appendix E: Capricorn Domestic Terminal Sector Coal Dust Mitigation Activities

Existing Capricorn Domestic Coal Terminal Unloading Facilities

The majority of the domestic coal unloading facilities consist of aging infrastructure making modifications costly and technically difficult. Outlined below are some of the opportunities the domestic facilities may be able to pursue in reducing dust generation. New unloading facilities should be aiming to include current best practice in dust minimisation.

Short-term activities

Modify existing unloading procedures

Description	Review and modify existing work practices to minimise dust generation and coal ploughing during train unloading operations Review and modify existing train unloading procedures to capture revised and new work practices adopted during the review of existing work practices
Potential contribution to coal dust management	Minimise the amount of coal dust settling onto wagon and bogie surfaces contributing to parasitic coal that creates coal dust in transit
Commercial, operational and other benefits	Opportunity to review and modify work practices with benefits in other business areas (e.g. productivity, safety, operational, etc)
Status	Existing operational review processes will be used with the inclusion of coal dust mitigation improvements
Future potential and indicative timelines	Operational improvements to better manage unloading procedures can be implemented within a year of the CDMP
Targets and measures	All coal wagons will be unloaded using the modified practices resulting in an immediate reduction of the amount of parasitic coal left on unloaded coal wagons.
Responsibilities and accountabilities	It is the responsibility of the Operations Manager of the coal wagon unloading facility to include coal dust mitigation into procedural reviews. Upon implementation the new procedures are delivered by and accountable to the shift manager of the unloading facility at the time of unloading.
Reporting	Nil
Decision criteria (if not in place)	Coal dust mitigation by means of unloading practices will only be implemented based on the total effect of a modified practice. If this mitigation activity causes detrimental commercial, productivity or other effects it may be discounted for whole-of-business benefits reasons.

Operator Procedural Training

Description	Develop and undertake operator procedural training to implement revised and new unloading practices to ensure consistent work practices across all work crews involved with train unloading.
Potential contribution to coal dust management	Minimises the amount of coal dust remaining in and settling onto wagon and bogie surfaces contributing to parasitic coal that creates coal dust in transit
Commercial, operational and other benefits	Opportunity to review and modify work practices with benefits in other business areas (e.g. productivity, safety, operational, etc)
Status	Existing operational review processes will be used with the inclusion of coal dust mitigation improvements
Future potential and indicative timelines	Operational improvements to better manage unloading procedures can be implemented within a year of the CDMP
Targets and measures	All coal wagons will be unloaded using the modified practices resulting in an immediate reduction of the amount of parasitic coal left on unloaded coal wagons.
Responsibilities and accountabilities	It is the responsibility of the Operations Manager of the coal wagon unloading facility to include coal dust mitigation into procedural reviews. Upon implementation the new procedures are delivered by and accountable to the shift manager of the unloading facility at the time of unloading.
Reporting	Nil
Decision criteria (if not in place)	Coal dust mitigation by means of improved unloading practices will only be implemented based on the total effect of a modified practice. If this practice causes detrimental commercial, productivity or other effects it may be discounted for whole-of-business benefits reasons.

Monitor Empty Wagons

Description	Develop and implement a system of immediately and consistently recording and reporting residual coal in unloaded wagons with a feedback mechanism on to site personnel
Potential contribution to coal dust management	Removal of residual coal from unloaded coal wagons will have a meaningful impact on coal dust emissions, particularly in the higher population centres near to the terminals where much of the residual coal is emitted.
Commercial, operational and other benefits	Reduction of residual coal in unloaded wagons will address: Reduced track closures and ballast cleaning costs Reduced coal contamination
Status	Automated wagon scanning technology is being researched and developed. Current options are limited to manual CCTV inspection of wagons after unloading.
Future potential and indicative timelines	Full implementation of automated wagon scanning technology and response systems is greater than 5 years off. Short-term solutions will need to utilise manual CCTV inspection methods.
Targets and measures	Implementation of empty wagon scanners is a long-term target. The percentage of completely emptied wagons will approach 100% as empty wagon scanning is implemented.
Responsibilities and accountabilities	Empty wagons are the responsibility of the terminal dump station management.
Reporting	Nil

Decision criteria (if not in place)	Coal dust mitigation by means of residual coal detection and response will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, productivity or other affects it may be discounted.

Community liaison and communication

Description	Maintain clear and regular communication with local communities. Within 24 hours of an incident (allow time for preliminary investigation) hold discussions with person/persons reporting an incident on the nature of complaint
Potential contribution to coal dust management	Improved relations with local communities, councils and forums that raise the social responsibility profile and provide opportunity to better focus solutions onto root cause of community perception and concerns.
Commercial, operational and other benefits	Opportunity to manage risk of community concerns on other issues.
Status	Current community liaison and communications occur on an as required basis.
Future potential and indicative timelines	Future communications could be scaled up to include regular community forums and meetings with key representatives as selected by the community.
Targets and measures	Manage issues proactively in the future and with good community engagement
Responsibilities and accountabilities	Community communications to be the responsibility of the business communications manager.
Reporting	Nil
Decision criteria (if not in place)	Coal dust management by means of community liaison and communication will be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, productivity or other affects it may be discounted.

Increase Environmental Awareness Internally

Description	Develop environmental awareness about fugitive dust generation among operational and maintenance personnel associated with coal handling by introducing dust generation at daily tool box meetings, environmental forums on site and analysing dust generation events as soon as practical.
Potential contribution to coal dust management	Empowering the operational personnel to consciously improve coal dust emissions by making changes to their processes and equipment
Commercial, operational and other benefits	Improve internal communication and continuous improvement culture
Status	The level and depth of current environmental awareness training varies across the customer base due to specific site requirements. Opportunity for liaison between domestic customers to review and where practical standardise training material
Future potential and indicative timelines	A environmental awareness training package could be developed and delivered within 12 months
Targets and measures	Have 80% of operational personnel that have opportunity to influence coal dust emissions attend the environmental awareness training within 12 months
Responsibilities and accountabilities	The information and tools developed by QR Network's Coal Dust Management Project could be adapted and be used as part of regular tool box meetings. This would be the responsibility unloading facility operations managers
Reporting	Dust incidents and dust related KPIs discussed and reported at tool box meetings, take five talks, safety meetings and safety shares to reinforce the importance of minimising and eliminating dust along the length of rail corridors

Decision criteria (if not in place)	Coal dust mitigation by means of increased internal environmental awareness will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, productivity or other affects it may be discounted.

Medium-term activities

Washing of train wheels after unloading

Description	The wheels of the unloaded wagon are washed by small jet sprays immediately after unloading to reduce parasitic coal that contributes to derailments when caked onto rails and wheels. Wheel washing requires similar (or the same amount) of civil works below rail tracks as wagon washing facilities to capture coal and water and should be considered as the initial phase of wagon washing facilities.
Potential contribution to coal dust management	Reduces residual coal on wheels that would otherwise be carried outside the terminal to be emitted into the environment
Commercial, operational and other benefits	Reduces the coal on wheels and rails that builds up over time and causes derailments.
Status	Pilot trials at export terminals. No implementation in domestic terminals
Future potential and indicative timelines	Wagon wheel washing to be included in each customers 5 year capital expenditure program with the timing dependent on discussions with QR Network for under rail modifications to capture coal and water.
Targets and measures	Have 80% of all wheels washed on wagons departing domestic coal terminals
Responsibilities and accountabilities	Domestic terminal operations mangers are responsible for the installation and continued operation of wheel washing equipment
Reporting	
Decision criteria (if not in place)	Coal dust mitigation by means of wheel washing will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, production or other affects it may be discounted.

Wagon vibrators

Description	Domestic coal unloading facilities are fitted with manually operated jack hammering facilities that target coal hang up in individual wagons and general lack of space to retrofit remotely operated equipment to vibrate every wagon prior to reaching the Kwik door closing trigger. With improved lighting and video surveillance cameras used in conjunction with overhead platforms in de-energised unloading sheds an individual coal hang up could be removed manually by hosing or by the use of remotely controlled water nozzles which eliminates vibrators which are a potential safety hazard when used manually and potential cause of wagon damage Scanning the internals of each class of wagon using ultrasonics or laser technology for comparison with a clean wagon profile to determine coal hang up coupled to remotely controlled water nozzles that specifically target the coal hang up would be economical on water usage with water and coal processed by existing coal handling and water recovery systems
Potential contribution to coal dust management	Removal of residual coal from unloaded coal wagons will have a meaningful impact on coal dust emissions, particularly in the higher population centres near to the terminals where much of the residual coal is emitted.

Commercial, operational and other benefits	Reduction of residual coal in unloaded wagons will address: Reduced track closures and ballast cleaning costs Reduced coal contamination
Status	Existing residual coal removal techniques are limited to jack hammering. Large wagon vibrators are commercially and physically complex to implement.
Future potential and indicative timelines	As wagon vibrator technology develops future installations may improve
Targets and measures	To remove all residual coal from unloaded wagons
Responsibilities and accountabilities	The installation and operation of wagon vibrating equipment is the responsibility of unloading facility operations managers
Reporting	NA
Decision criteria (if not in place)	Coal dust mitigation by means of wagon vibrators will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, production or other affects it may be discounted.

Moisture levels in transit

Description	There are limited opportunities to have coal delivered with the coal in each wagon at or above the dust extinction moisture (DEM) for a particular coal due to limited water supplies at mine sites
Potential contribution to coal dust management	Moisture levels throughout the body of coal in a wagon while in transit only have a minor influence on coal dust generation. The moisture levels on the surface of wagons is short lived in transit and addressed by veneering
Commercial, operational and other benefits	There are no commercial or operating benefits to the Domestic Customer by increasing moisture levels to DEM because: • Transporting more water less coal • Purchasing water at energy prices • Loss of boiler/kiln efficiency
Status	Domestic Customers prefer to manage increasing moisture levels to achieve DEM during the unloading and stockpiling
Future potential and indicative timelines	Development of DEM monitoring equipment and moisture control devices are underway. As the technology becomes refined increased implementation at loading can be expected.
Targets and measures	
Responsibilities and accountabilities	It is the responsibility of the mine load out facility to ensure coal is loaded at the suitable DEM so that dust is minimised upon arrival and unloading at the terminal
Reporting	NA
Decision criteria (if not in place)	Coal dust mitigation by means of managing moisture levels in transit will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, production or other affects it may be discounted.

Wagon Sill Brushes

Description	Use of wagon sill brushes have the potential to generate dust and are inferior to water-based dust mitigation strategies and will only be considered in conjunction with dust extraction strategies at the coal unloading facility.

Potential contribution to coal dust management	Sill brushes reduce the parasitic coal that remains on the sills of unloaded wagons.
Commercial, operational and other benefits	None
Status	Sill brushes are currently being used at some terminal dump stations
Future potential and indicative timelines	The benefits of sill brushes along with wagon washing and targeted coal removal is to be considered when deciding on an appropriate method of wagon cleaning for each domestic coal unloading facility
Targets and measures	To clean the sills of 80% of all coal wagons unloaded at terminals
Responsibilities and accountabilities	The dump station operations manager is responsible for implementing and operating the sill brushes after discussions with coal train operators.
Reporting	NA
Decision criteria (if not in place)	Coal dust mitigation by means of sill brushes will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, production or other affects it may be discounted.

Long-term activities

Install a Wagon cleaning station

Description	An installation or facility that cleans out the residual coal in unloaded wagons. This may be achieved by means of general washing with water, specific spraying by jet hoses, air pressure or other means. This mitigation activity may be combined with the monitoring of empty wagons by means of wagon scanning, CCTV or manual viewing to conserve resources when cleaning out the residual coal.
Potential contribution to coal dust management	Reduces the dust source of residual coal that deposits directly or by dust into the environment on the return journey of coal wagons
Commercial, operational and other benefits	Removes contamination from other coal types
Status	Wagon cleaning solutions are being developed to address the problem of residual coal. As there is no certainty around the best solution and implementation is likely to occur in the long-term.
Future potential and indicative timelines	Existing coal unloading infrastructure is designed to support wagon class sizes significantly smaller than those currently in service. This limits the ability to upgrade coal unloading facilities to Greenfield site standards. When OEM support for installed equipment is no longer available and an upgrade is necessary, it is recommended that the latest ideas in materials handling be applied within the boundaries of the existing civil structures.
Targets and measures	To investigate wagon cleaning solutions by means of pilot trials and industry discussion.
Responsibilities and accountabilities	It is the responsibility of terminal managers to continue development of wagon cleaning solutions.
Reporting	NA
Decision criteria (if not in place)	Coal dust mitigation by means of wagon cleaning will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, production or other affects it may be discounted.

Improved unloading pit design

Description	New installations to consider and incorporate the latest material handling in relating to: Unloading pit design Dust mitigation strategies when unloading and handling coal Wagon cleaning station and associated works incorporated into the unloading facility
Potential contribution to coal dust management	Better design and construction of unloading pits that properly consider coal dust from trains in transit will significantly influence residual coal and parasitic coal.
Commercial, operational and other benefits	Opportunity to influence and improve coal unloading operations when designing unloading facilities will create productivity gains for terminals
Status	Unloading facility design that considers coal dust mitigation in transit is in early stages of development.
Future potential and indicative timelines	Any meaningful implementation will be in the long-term.
Targets and measures	To develop a commercially workable solution in the medium term that could be implemented in the long-term
Responsibilities and accountabilities	A whole of (terminal) sector approach to developing a solution lead by a sector representative would be most suitable. QR Network in conjunction with industry develop and provide guidelines for the design and installation of loading and unloading terminals targeting dust minimisation
Reporting	NA
Decision criteria (if not in place)	Coal dust mitigation by means of improved unloading pit design will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, production or other affects it may be discounted.

Appendix F: Goonyella Export Terminal Sector Coal Dust Mitigation Opportunities

Wagon unloading practices

Description	Review and modify existing work practices to minimise dust generation and coal ploughing during train unloading operations Review and modify existing train unloading procedures to capture revised and new work practices identified during the review of existing work practices
Potential contribution to coal dust management	Minimise the amount of coal dust settling onto wagon and bogie surfaces contributing to parasitic coal that creates coal dust in transit
Commercial, operational and other benefits	Opportunity to review and modify work practices with benefits in other business areas (e.g. productivity, safety, operational, etc)
Status	Existing operational review processes will be used with the inclusion of coal dust mitigation improvements
Future potential and indicative timelines	Operational improvements to better manage unloading procedures can be implemented within a year of the CDMP
Targets and measures	In cases of confirmed parasitic coal, consideration will be given to unloading coal wagons with modified practices aimed at reducing any carry-over left on unloaded coal wagons.

Responsibilities and accountabilities	The Terminal Operator will review coal dust mitigation practices so as to capture any identified residual/parasitic coal carry-over
Reporting	The 6 monthly report to DERM will include any modification of unloading practices information resulting from any review, including: The progress of implementation of modified procedures The percentage of coal wagons incorrectly unloaded The estimated reduction in quantity of parasitic coal on wagon and bogie surfaces
Decision criteria (if not in place)	Coal dust mitigation by means of unloading practices will only be implemented based on the total effect of a modified practice. If this mitigation activity causes detrimental commercial, productivity or other effects, it may be discounted for whole-of-business benefits reasons.

Operator Procedural Training

Description	Review and if warranted, develop operator procedural training to implement revised and new unloading practices to ensure consistent work practices across all work crews involved with train unloading.
Potential contribution to coal dust management	Minimise the amount of coal dust settling onto wagon and bogie surfaces contributing to parasitic coal that creates coal dust in transit
Commercial, operational and other benefits	Opportunity to review and modify work practices with benefits in other business areas (e.g. productivity, safety, operational, etc)
Status	Existing operational review processes will be used with the inclusion of coal dust mitigation improvements
Future potential and indicative timelines	Operational improvements to better manage unloading procedures should (where possible) be implemented within a year of the CDMP
Targets and measures	In cases of confirmed parasitic coal, consideration will be given to unloading coal wagons with modified practices aimed at reducing any carry-over left on unloaded coal wagons.
Responsibilities and accountabilities	The Terminal Operator will review coal dust mitigation practices so as to capture any identified residual/parasitic coal carry-over
Reporting	The 6 monthly report to DERM will include any operational procedural training information resulting from any review , including: The progress of implementation of modified procedures The percentage of coal wagons incorrectly unloaded The estimated reduction in quantity of parasitic coal on wagon and bogie surfaces
Decision criteria (if not in place)	Coal dust mitigation by means of improved unloading practices will only be implemented based on the total effect of a modified practice. If this practice causes detrimental commercial, productivity or other effects it may be discounted for whole-of-business benefits reasons.

Hopper level/Train speed indicators

Description	Hopper level/train speed indicators refers to an automated monitoring and control of the height of the coal piling up in the dump station hopper so that train speed can be adjusted to ensure the height of the coal is ideal for unloading.
Potential contribution to coal dust management	This activity will reduce the amount of coal ploughing and build up of parasitic coal under wagons during unloading.

Commercial, operational and other benefits	Improved visibility and control of the unloading coal allowing opportunity for improved management of the product and infrastructure and potential to improve safety in and around the dump station
Status	In place at DBCT and Hay Point
Future potential and indicative timelines	NA
Targets and measures	NA
Responsibilities and accountabilities	NA
Reporting	NA
Decision criteria (if not in place)	NA

Wagon cleaning facility

Description	Removal of residual coal from the inside of coal wagons by mechanical vibration or washing
Potential contribution to coal dust management	This activity will have a significant impact on residual coal in unloaded coal wagons on the return journey should that become the leading indicator of dust emissions. The removal of residual coal could stop any coal leaking out of doors or being blown out of wagons due to wind turbulence inside the empty wagon.
Commercial, operational and other benefits	A completely emptied wagon could reduce the contamination of coal in subsequent journeys.
Status	Jackhammers & wagon vibrators are currently in place at DBCT and Hay Point
Future potential and indicative timelines	To be implemented in new coal terminals in the future
Targets and measures	NA
Responsibilities and accountabilities	NA
Reporting	NA
Decision criteria (if not in place)	NA

Washing of train wheels after unloading (DBCT only)

Description	Wheel washing by recycled water sprayed on to wagon wheels after discharge
Potential contribution to coal dust management	Reduces residual coal on wheels that would otherwise be carried outside the terminal to be emitted into the environment
Commercial, operational and other benefits	Reduction in the amount of coal contributing to ballast fouling in the DBCT rail balloon loops due to design of unloading pits. The design of Hay Point pits minimises ploughing and coal on wagon wheels.
Status	Established at DBCT on two rail receival stations, otherwise for consideration at other export terminals.
Future potential and indicative timelines	Wheels washers will be implemented at the exit point of DBCT dump stations over the next twelve months
Targets and measures	Have 80% of all wheels washed on wagons departing domestic coal terminals

Responsibilities and accountabilities	Domestic terminal operations mangers are responsible for the installation and continued operation of wheel washing equipment
Reporting	Regular 6 monthly reports to DERM will include an indication of implementation of wheels washing equipment and the percentage of wagons that have had wheels washed thereafter.
Decision criteria (if not in place)	Coal dust mitigation by means of wheel washing will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, production or other affects it may be discounted.

Wagon vibrators

Description	Large wagon vibrators temporarily attached to wagons to excite coal and facilitate discharge. This dislodges coal that has not emptied out of the wagon before the kwik-drop doors pass the closing trigger.
Potential contribution to coal dust management	Removal of residual coal from unloaded coal wagons will have a meaningful impact on coal dust emissions, particularly in the higher population centres near to the terminals where much of the residual coal is emitted.
Commercial, operational and other benefits	Reduction of residual coal in unloaded wagons will address: Greater wagon capacity on subsequent trips Reduced track closures and ballast cleaning costs Reduced coal contamination
Status	Some unloading pits are fitted with large wagon vibrators and operate on coal wagons that have been identified as potentially having sticky coal. All pits at Hay Point have wagon vibrators fitted and in use.
Future potential and indicative timelines	Redesign coal wagons that allow clean discharge of all coal
Targets and measures	To remove all residual coal from unloaded wagons
Responsibilities and accountabilities	The installation and operation of wagon vibrating equipment is the responsibility of unloading facility
Reporting	Regular 6 monthly reports to DERM will include an indication of implementation of wagon vibrator equipment
Decision criteria (if not in place)	Coal dust mitigation by means of wagon vibrators will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, production or other affects it may be discounted.

Unloading facility infrastructure

Description	Any new unloading facility is to consider changes to design that improve the management of coal dust in transit. For example, increased pit depth and increase grate height to minimise coal ploughing. Significant infrastructure changes that are either too complex or too expensive to retrofit to existing facilities can be included in new infrastructure design.
Potential contribution to coal dust management	Prevention of coal ploughing, reduction of parasitic and residual coal dust sources.
Commercial, operational and other benefits	Opportunity to improve community perception and operational productivity.
Status	Current Hay Point Pit depth and grate height minimises coal ploughing. To be considered at all new facilities

Future potential and indicative timelines	
Targets and measures	
Responsibilities and accountabilities	
Reporting	
Decision criteria (if not in place)	Coal dust mitigation by means of unloading facility infrastructure improvements will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, production or other affects it may be discounted.

Increase Environmental Awareness Internally

Description	Review and if warranted, develop environmental awareness about fugitive dust generation among operational and maintenance personnel associated with coal handling. This could include introducing dust generation at daily tool box meetings, environmental forums on site and analysing dust generation events as soon as practical.
Potential contribution to coal dust management	Empowering the operational personnel to consciously improve coal dust emissions by making changes to their processes and equipment
Commercial, operational and other benefits	Improve internal communication and continuous improvement culture
Status	Current internal environmental awareness training under review
Future potential and indicative timelines	An appropriate environmental awareness training package should be developed and delivered within 12 months
Targets and measures	Have 80% of operational personnel that have opportunity to influence coal dust emissions attend the environmental awareness training within 12 months
Responsibilities and accountabilities	The information and tools developed by QR Network's Coal Dust Management Project could be adapted and be used as part of regular tool box meetings.
Reporting	Regular 6 monthly reports to DERM will include an indication of progress and delivery of internal environmental awareness training.
Decision criteria (if not in place)	Coal dust mitigation by means of increased internal environmental awareness will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, productivity or other affects it may be discounted.

Residual Coal Monitoring

Description	Develop and implement a system of immediately and consistently recording and reporting residual coal in unloaded wagons with a feedback mechanism to site personnel
Potential contribution to coal dust management	Removal of residual coal from unloaded coal wagons could have a meaningful impact on coal dust emissions, particularly in the higher population centres near to the terminals where much of the residual coal is emitted.
Commercial, operational and other benefits	Reduction of residual coal in unloaded wagons should address: Greater wagon capacity on subsequent trips Reduced track closures and ballast cleaning costs Reduced coal contamination

Status	Automated wagon scanning technology is being researched and developed in some systems. Current options are limited to manual CCTV inspection of wagons after unloading.
Future potential and indicative timelines	Full implementation of automated wagon scanning technology and response systems once technical solutions have been fully developed and proved. Short-term solutions will need to utilise manual CCTV inspection methods.
Targets and measures	Implementation of empty wagon scanners is a long-term target. The percentage of completely emptied wagons will approach 100% as empty wagon scanning is implemented.
Responsibilities and accountabilities	Provision of free flowing coal is the responsibility of the coal Producer and supply of rail wagon designs that facilitate discharge is the responsibility of the rail haulier.
Reporting	The 6 monthly report to DERM will include empty wagon monitoring information, including the progress of development of wagon scan technology. The percentage of coal wagons checked and properly emptied. The development and implementation of appropriately designed rail wagons
Decision criteria (if not in place)	Coal dust mitigation by means of residual coal detection and response will only be implemented based on whole-of-business benefits. If this initiative causes detrimental commercial, productivity or other affects it may be discounted.

Appendix G: Capricorn Export Terminal Sector Coal Dust Mitigation Activities

Training / Communication – Internal Training / Environmental Awareness

Description	Develop and undertake operator procedural training to implement revised and new unloading practices to ensure consistent work practices across all work crews involved with train unloading. Develop environmental awareness about fugitive dust generation among operational and maintenance personnel associated with coal handling
Potential contribution to coal dust management	Minimise the amount of coal dust settling onto wagon and bogie surfaces contributing to parasitic coal that creates coal dust in transit
Commercial, operational and other benefits	Opportunity to review and modify work practices with benefits in other business areas (e.g. productivity, safety, operational, etc)
Status	As per GPC ISO14001:2004 certified: ▪ Competence, Training and Awareness Procedure, GPC ref # 142487v3
Future potential and indicative timelines	Regular and Ongoing as per GPC ISO14001:2004 certified: ▪ Competence, Training and Awareness Schedule - ref # 143486
Targets and measures	All staff to receive training as per GPC ISO14001:2004 certified: ▪ Competence, Training and Awareness Schedule - GPC ref # 142487v3
Responsibilities and accountabilities	As per GPC ISO14001:2004 certified: ▪ Roles and Responsibilities procedure, GPC ref # 142195v2
Reporting	Training logs as per GPC ISO14001:2004 certified: ▪ Competence, Training and Awareness Schedule - GPC ref # 142487v3

Decision criteria (if not in place)	Future investment and activity that reduces parasitic coal loads will be based on monitoring and measurements feedback from supply chain stakeholders. Coal dust mitigation by means of unloading practices will only be implemented based on the total effect of a modified practice.

Training / Communication - Community liaison and External communication

Description	Maintain clear and regular communication with local communities. The GPCL Environmental Working Group is a regular community consultative process involving community and business representatives with an interest in our projects and activities. The Group is a forum in which GPC Management, Communications and Environment team members work collectively to create community awareness of GPCL activities with a particular focus on environmental initiatives. Within 24 hours of an incident (allow time for preliminary investigation) hold discussions with person/persons reporting an incident on the nature of complaint
Potential contribution to coal dust management	Improved relations with local communities, councils and forums that raise the social responsibility profile and provide opportunity to better focus solutions onto root cause of community perception and concerns.
Commercial, operational and other benefits	Opportunity to manage risk of community concerns on other issues.
Status	Quarterly community information sessions and complaint response as per GPC ISO14001:2004 certified: ▪ Communications Procedure, GPC ref # 142488v2
Future potential and indicative timelines	Community Working Group – Quarterly Complaint Response – As required
Targets and measures	High satisfaction rating on corporate image study
Responsibilities and accountabilities	As per GPC ISO14001:2004 certified: Roles and Responsibilities procedure, GPC ref # 142195v2
Reporting	Reports are regularly provided to the community via: ▪ Newsletters ▪ Forums ▪ Quarterly newspaper advertisements ▪ Community information sessions
Decision criteria (if not in place)	NA – Community Relations Strategy is in place

Procedural / Infrastructure - Wagon unloading practices

Description	Review and modify existing work practices to minimise dust generation and coal ploughing during train unloading operations Review and modify existing train unloading procedures to capture revised and new work practices identified during the review of existing work practices
Potential contribution to coal dust management	Minimise the amount of coal dust settling onto wagon and bogie surfaces contributing to parasitic coal that creates coal dust in transit
Commercial, operational and other benefits	Opportunity to review and modify work practices with benefits in other business areas (e.g. productivity, safety, operational, etc)

Status	▪ As per RG Tanna Coal Terminal Management of Dusty Coal Types Procedure, GPC ref # 368662v4 ▪ Dusty Coal Types procedure is reviewed and amended as required and / or annually
Future potential and indicative timelines	Ongoing
Targets and measures	Reduction targets and summary of initiatives as outlined in: **Barney Point Terminal** http://www.cqpa.com.au/Pages/Publications/BPCTBenchmarkingStudy/BPCTBenchmarkingStudyFullReport2008.PDF **Reg Tanna Coal Terminal** http://www.cqpa.com.au/Pages/Publications/RGTCTBenchmarkingStudy/RGTCTBenchmarkingStudyFullReport2008.PDF
Responsibilities and accountabilities	As per GPC AS/NZSISO14001:2004 certified: • Roles and Responsibilities procedure, GPC ref # 142195v2
Reporting	As per GPC ISO14001:2004 certified: ▪ Communications Procedure - GPC ref # 142488v2, ▪ Monitoring and Measurement Procedure - GPC ref # 142194v2 ▪ Evaluation of Compliance Procedure, GPC ref # 142503v2. Also as per monthly reporting to the DERM on Schedule G of Development Authorities IPCE00665607 and IPCE00661407.
Decision criteria (if not in place)	Future investment and activity that reduces parasitic coal loads will be based on monitoring and measurements feedback from supply chain stakeholders. Coal dust mitigation by means of unloading practices will only be implemented based on the total effect of a modified practice.

Procedural / *Infrastructure* - Hopper level/Train speed indicators

Description	Hopper level/train speed indicators refers to an automated monitoring and control of the height of the coal piling up in the dump station hopper so that train speed can be adjusted to ensure the height of the coal is ideal for unloading.
Potential contribution to coal dust management	This activity will reduce the amount of coal ploughing during unloading and reduce the amount of dust generated by the falling coal.
Commercial, operational and other benefits	Improved visibility and control of the unloading coal allowing opportunity for improved management of the product and infrastructure and potential to improve safety in and around the dump station
Status	Currently applied at Dump station 3 Further applications are under investigation as per: ▪ 09/10 Sustaining Capital – Environment Improvements Portfolio (Summary doc ref # 460951)
Future potential and indicative timelines	Application will be based on trial outcomes and decision criteria below.

Targets and measures	Reduction targets and summary of initiatives as outlined in: **Barney Point Terminal** http://www.cqpa.com.au/Pages/Publications/BPCTBenchmarkingStudy/ BPCTBenchmarkingStudyFullReport2008.PDF **Reg Tanna Coal Terminal** http://www.cqpa.com.au/Pages/Publications/RGTCTBenchmarkingStudy/ RGTCTBenchmarkingStudyFullReport2008.PDF
Responsibilities and accountabilities	As per GPC ISO14001:2004 certified: Roles and Responsibilities procedure, GPC ref # 142195v2
Reporting	As per monthly reporting to the DERM on Schedule G of Development Authorities IPCE00665607 and IPCE00661407.
Decision criteria (if not in place)	Future investment and activity that reduces parasitic coal loads will be based on monitoring and measurements feedback from supply chain stakeholders. Coal dust mitigation by means of unloading practices will only be implemented based on the total effect of a modified practice.

Procedural / *Infrastructure* – Remnant Coal Monitoring

Description	Develop and implement a system of immediately and consistently recording and reporting residual coal in unloaded wagons with a feedback mechanism on to site personnel
Potential contribution to coal dust management	Removal of residual coal from unloaded coal wagons will have a meaningful impact on coal dust emissions, particularly in the higher population centres near to the terminals where much of the residual coal is emitted.
Commercial, operational and other benefits	Reduction of residual coal in unloaded wagons will address: Greater wagon capacity on subsequent trips Reduced track closures and ballast cleaning costs Reduced coal contamination
Status	Automated wagon scanning technology has been installed and trialled at pit 3 (RGTCT).
Future potential and indicative timelines	Further application will be based on the outcome of these trials. Full implementation of automated wagon scanning technology and response systems is greater than 5 years off. Short-term solutions will need to utilise manual CCTV inspection methods.
Targets and measures	Reduction targets and summary of initiatives as outlined in: **Barney Point Terminal** http://www.cqpa.com.au/Pages/Publications/BPCTBenchmarkingStudy/BPCTBenchmarkingStudyFullReport2008.PDF **Reg Tanna Coal Terminal** http://www.cqpa.com.au/Pages/Publications/RGTCTBenchmarkingStudy/RGTCTBenchmarkingStudyFullReport2008.PDF
Responsibilities and accountabilities	As per GPC ISO14001:2004 certified: Roles and Responsibilities procedure, GPC ref # 142195v2
Reporting	As per monthly reporting to the DERM on Schedule G of Development Authorities IPCE00665607 and IPCE00661407.

Decision criteria (if not in place)	Future investment and activity that reduces parasitic coal loads will be based on monitoring and measurements feedback from supply chain stakeholders. Coal dust mitigation by means of unloading practices will only be implemented based on the total effect of a modified practice.

Procedural / *Infrastructure* –Remnant Coal Elimination / Removal (Wagon Interior)

Description	A dedicated activity that removes residual coal from the inside of coal wagons while the kwik drop doors are still open immediately after unloading.
Potential contribution to coal dust management	This activity will have a significant impact on residual coal in unloaded coal wagons on the return journey. The removal of residual coal will stop any coal leaking out of doors or being blown out of wagon due to wind turbulence inside the empty wagon
Commercial, operational and other benefits	A completely emptied wagon will reduce the contamination of coal in subsequent journeys. Furthermore, a properly emptied wagon allows a greater quantity of coal to be loaded.
Status	Jackhammers currently utilised at all dump stations. Trials have been conducted with composite heads which achieved limited success. Other technologies to reduce / eliminate remnant coal such as wagon vibrators, wagon washing and targeted high pressure air sprays will be further investigated and implemented if appropriate.
Future potential and indicative timelines	Investigation and implementation will be based on the application of GPCL's 09/10 sustaining capital – Environment Improvements Portfolio (Summary doc ref # 460951)
Targets and measures	Reduction targets and summary of initiatives as outlined in: **Barney Point Terminal** http://www.cqpa.com.au/Pages/Publications/BPCTBenchmarkingStudy/ BPCTBenchmarkingStudyFullReport2008.PDF **Reg Tanna Coal Terminal** http://www.cqpa.com.au/Pages/Publications/RGTCTBenchmarkingStudy/ RGTCTBenchmarkingStudyFullReport2008.PDF
Responsibilities and accountabilities	As per GPC ISO14001:2004 certified: Roles and Responsibilities procedure, GPC ref # 142195v2
Reporting	As per monthly reporting to the DERM on Schedule G of Development Authorities IPCE00665607 and IPCE00661407.
Decision criteria (if not in place)	Future investment and activity that reduces parasitic coal loads will be based on monitoring and measurements feedback from supply chain stakeholders. Coal dust mitigation by means of unloading practices will only be implemented based on the total effect of a modified practice.

Procedural / *Infrastructure* - Remnant Coal Elimination / Removal (Wagon Exterior)

Description	A dedicated activity that removes residual coal from the outside of coal wagons immediately after unloading.
Potential contribution to coal dust management	Reduces residual coal on wheels and sills that would otherwise be carried outside the terminal to be emitted into the environment
Commercial, operational and other benefits	Reduction in the amount of coal contributing to ballast fouling

Status	Wagon wheel washing pilot trials underway – installation of wagon wheel washers at Dump Station 3 complete. Additional measures such as wagon washing and sill brushes will be considered in the medium term (<5 years)
Future potential and indicative timelines	Wheels washers will be implemented at the exit point of terminal dump stations based on outcomes of trials.
Targets and measures	Reduction targets and summary of initiatives as outlined in: **Barney Point Terminal** http://www.cqpa.com.au/Pages/Publications/BPCTBenchmarkingStudy/ BPCTBenchmarkingStudyFullReport2008.PDF **Reg Tanna Coal Terminal** http://www.cqpa.com.au/Pages/Publications/RGTCTBenchmarkingStudy/ RGTCTBenchmarkingStudyFullReport2008.PDF
Responsibilities and accountabilities	As per GPC ISO14001:2004 certified: Roles and Responsibilities procedure, GPC ref # 142195v2
Reporting	As per monthly reporting to the DERM on Schedule G of Development Authorities IPCE00665607 and IPCE00661407.
Decision criteria (if not in place)	Future investment and activity that reduces parasitic coal loads will be based on monitoring and measurements feedback from supply chain stakeholders. Coal dust mitigation by means of unloading practices will only be implemented based on the total effect of a modified practice.

Procedural / *Infrastructure* – New Unloading facility infrastructure

Description	Any new unloading facility is to include changes to design that improve the management of coal dust in transit. For example, increased pit depth and increase grate height to minimise coal ploughing. Significant infrastructure changes that are either too complex or too expensive to retrofit to existing facilities can be included in new infrastructure design.
Potential contribution to coal dust management	Prevention of coal ploughing, reduction of parasitic and residual coal dust sources.
Commercial, operational and other benefits	Opportunity to improve community perception and operational productivity.