

DURALIE COAL MINE

RAIL HAULAGE NOISE AUDIT

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PREPARED FOR

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

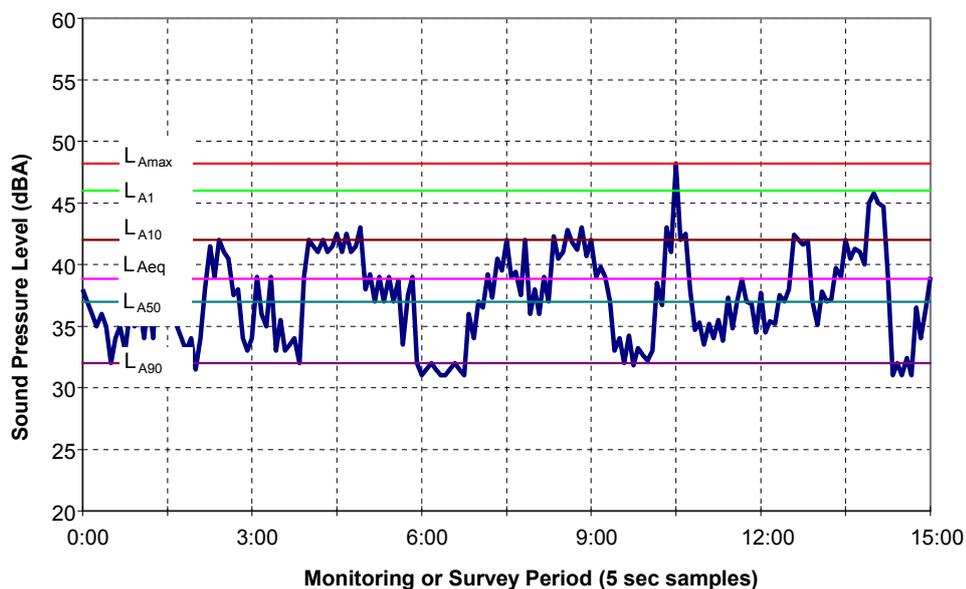
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

Duralie Coal Pty Ltd (DCPL) had its Project Approval conditions modified by the Planning and Assessment Commission on the 1 November 2012 and was notified on the 5 November 2012 to extend the hours that the Duralie ROM coal shuttle train can operate between the Duralie Coal Mine (DCM) and the Stratford Coal Mine (SCM), located in the Gloucester Valley of NSW. It should be noted that the.

The consolidated Project Approval includes a condition requiring that prior to 2014 and with every three-yearly independent environmental audit thereafter, a rail haulage audit shall be undertaken. The purpose of the rail haulage audit is to confirm that any noise and dust effects or logistical issues arising due to the shuttle train operations have been appropriately managed, in accordance with the Project Approval and relevant environmental documents.

Wilkinson Murray Pty Limited (WM) has been commissioned to undertake the rail haulage noise audit for 2013. Accordingly, a site visit was undertaken by WM on 26 November 2013 to carry out inspections of the rail infrastructure located on and between the Duralie and Stratford mine sites; to conduct interviews with key DCPL personnel to evaluate the existing site management of rail noise; and to sight and review relevant environmental records and documents to determine compliance status with respect to the relevant approval conditions.

This report provides a summary of the rail haulage noise audit, relevant to the approximate 12 month period between 5 November 2012 and 26 November 2013; this being the period between the Project Modification being approved and the WM site visit.

2 RELEVANT PROJECT APPROVAL CONDITIONS & COMMITMENTS

With respect to rail noise, Condition 9A, Schedule 5 of the consolidated Project Approval requires that the Rail Haulage Audit must:

- a) *be conducted by a suitably qualified, experienced and independent expert whose appointment has been endorsed by the Director-General;*
- b) *review the existing rail haulage operations to determine whether all reasonable and feasible measures are being implemented to minimise:*
 - ❖ *noise impacts from the Duralie shuttle train;*
 - ❖ *the use of the Duralie shuttle train during approved night-time hours; and*
 - ❖ *the dispatch of trains from the Duralie Coal Mine between 9.25 pm and 1 am the following day.*
- c) *recommend appropriate measures or actions to improve the efficiency of these rail haulage operations and minimise their associated impacts; and*
- d) *evaluate the use of the exceptional circumstances provision in Condition 8 of Schedule 2, and the associated reporting on any use of this provision on the Proponent's website.*

DCPL additionally committed to upgrading the existing locomotives for the shuttle trains in the Environmental Assessment. The DCPL commitment (Project Approval, Appendix 9) was:

"DCPL commits to replacing the existing locomotives on the DCM ROM coal transport train with GL class locomotives (or equivalent) which are quieter than the existing DCM locomotives from Year 2 of the Project (or sooner, subject to contract arrangements)."

It is considered that best practice locomotives using the NSW rail system are those that meet the locomotive noise criteria of the ARTC's EPL (No. 3142). EPL 3142 identifies GL Class locomotives as approved for operation and therefore are considered by EPA to meet the objective of the locomotive noise criteria.

3 DOCUMENTS REVIEWED DURING AUDIT

The documents identified in Table 3-1 have been reviewed in the course of the audit.

Table 3-1 Documentation Review during Audit

Document	Detailed Description
Project Approval	Project Approval for Application Number 08_0203, inclusive of Modifications provided since the completion of the Environmental Assessment titled Duralie Rail Hours Modification, dated April 2012, and associated responses to submissions dated 17 May 2012 and 24 May 2012.
Environmental Assessment	Duralie Rail Hours Modification, Environmental Assessment, prepared by DCPL, dated April 2012 (Document No. 00439326.docx) and appendices, as detailed below.
Environmental Assessment – Attachment 1	Land Ownership Figures – Duralie and Stratford.
Environmental Assessment – Appendix A	Duralie ROM Coal Transportation Logistics Review, prepared by Gloucester Coal Ltd, dated 20 February 2012.
Environmental Assessment – Appendix B	Rail Transport Noise Assessment, prepared by SLR Consulting Australia Pty Ltd, dated 20 February 2012.
Environmental Assessment – Appendix C	Australian Rail Track Corporation Letter, dated 17 February 2012.
Noise Management Plan	Duralie Coal Mine Noise Management Plan, prepared by DCPL, dated June 2013 (Document No. NMP-R02-E, Document No. 00525516).
Quarterly Noise Compliance Survey Reports	Reports detailing quarterly noise compliance surveys undertaken during 2013, prepared by Vipac Engineers and Scientists Ltd, dated February 2013, May 2013, July 2013 and 13 November 2013.
Shuttle Train Movements	Summary of Shuttle Train Movements for the period between 5 November 2012 to 5 December 2013
Noise Complaints Records	Summary of noise complaints received between 5 November 2012 and 30 September 2013.
Duralie Coal Mine Audit of rail haulage Version 0.1 (draft) (Referred to the PalazziRail Audit Report)	PalazziRail's audit findings regarding maintenance and operation of DCPL rail haulage.

4 REVIEW OF EXISTING RAIL HAULAGE OPERATIONS

The DCM is approved to produce up to 3 Mtpa of ROM coal that is transported by a dedicated 2,500 tonne shuttle train to the SCM located some 20 km to the north. The approved hours of operation of the Duralie shuttle train are between 6.00am and midnight (i.e. 18 hours). In exceptional circumstances, the Duralie shuttle train may operate on the North Coast Railway between midnight and 1.00am in accordance with Condition 8, Schedule 2 of the NSW Project Approval.

Up to 10 train movements per day may be directly associated with DCM operations. These trains will generate pass-by noise at receivers in close proximity to the railway line.

Trains originating from the DCM are controlled and operated by Aurizon (formerly QR National) once they leave the DCM. The ARTC manages access to the railway line.

4.1 Locomotives

The shuttle train is a push-pull configuration made up of 34 coal wagons and two locomotives (one at each end of the train).

The procedure to allow a locomotive to be used on the shuttle train requires Aurizon to provide noise data to DCPL and confirm that the locomotive is GL equivalent. Through the year there has been a pool of locomotives that have followed this process including a 6000 Class locomotive, the old 2800 class locomotives which have now been upgraded and are called 3200 Class and the 423 Class locomotives.

DCPL have a fleet of three locomotives available to use so that two are in use and one is available if a breakdown occurs.

The identified Duralie shuttle locomotives during the audit were:

- 1x 6000 Class; and
- 1x 3200 Class.

EPL 3142 identifies 6000 Class locomotives as approved for operation and therefore are considered by EPA to meet the objective of the locomotive noise criteria. Class 3200 locomotives, however, are identified by EPL 3142 as "*introduced prior to approval processes*". Sydney Trains is regulated by the same noise controls as the ARTC as set out in its license (EPL 12208). EPL 12208 identifies Class 3200 locomotives as approved (as of 28 June 2013). As such, both the 6000 and 3200 Class locomotives are equivalent to a GL Class locomotive.

In terms of the 423 class locomotive, it has been locked with a key to only allow up to notch 4 throttle position. This is to ensure the locomotive only operates as a GL equivalent locomotive.

Considering the above, the locomotives used in the shuttle train by design meet accepted noise objectives and DCPL's commitment to replacing the existing locomotives with GL Class or equivalent form Year 2 of the Project or sooner has been achieved.

Condition 13 of the consolidated project Approval addresses maintenance and operation of coal transportation plant, as follows:

13. *The Proponent shall ensure that all the plant and equipment used on site, or to transport coal from the site, is:*
- (a) maintained in a proper and efficient condition; and*
 - (b) operated in a proper and efficient manner.*

During the site visit WM inspected the train, whilst idling and in motion. The train was assessed as to have been maintained in a proper and efficient condition and operated in a proper and efficient manner.

The Palazzirail Audit Report states in more detail the processes used by DCPL to manage the maintenance of the locomotives and wagons.

4.2 Train Movements

Under Schedule 2 of the consolidated Project Approval, Conditions 7, 8 and 8A provide limits on the number of shuttle train movements (cycles) permitted and the permitted timeframes for these cycles, as follows:

7. *The Proponent shall ensure that:*
- (a) all coal is transported from the site by rail;*
 - (b) no more than 5 laden trains leave the site each day; and*
 - (c) no more than 4 laden trains leave the site each day, when averaged over a 12 month period.*
8. *The Proponent shall:*
- (a) only dispatch shuttle trains from the site between 6am and 10pm;*
 - (b) only receive shuttle trains on site between 6am and midnight; and*
 - (c) only operate shuttle trains on the North Coast railway between midnight and 1am in exceptional circumstances.*
- 8A. *Within 12 hours of operating shuttle trains on the North Coast railway between midnight and 1am in exceptional circumstances, the Proponent shall provide a detailed explanation of the exceptional circumstances on its website.*

Under its glossary of definitions, the consolidated Project Approval defines "Exceptional Circumstances as, "Circumstances when ARTC determines that the shuttle train must operate on the North Coast railway between midnight and 1am because there have been significant disruptions to the services on the railway over the last 12 hours, or where there have been power outages at either the Stratford or Duralie mines that have materially affected the operation of the shuttle train on the North Coast railway".

4.2.1 Record of Shuttle Train Movements

Records of shuttle train movements have been provided by DCPL (DURALIE COAL TRAIN PERFORMANCE JULY 2012 - DEC 2013- Sep 1.xlsx). Additionally, coinciding train movement records maintained by ARTC have been provided.

WM has reviewed these records over the relevant dates (i.e. since the Rail Hours Modification was approved on 5 November 2012 until the last available recorded date on 15 November 2013), in order to evaluate compliance with Approval Conditions 7, 8 and 8A. This review indicates that full compliance with these conditions was achieved.

Only one significant inconsistency between the DCPL and ARTC records was noted, which it transpired, was due to a typographical error on the part of DCPL. This has subsequently been amended.

According to the records there have been no shuttle train movements on the North Coast railway between midnight and 1.00am; i.e. within the '*exceptional circumstances*' timeframe.

4.2.2 Minimisation of Train Operations during the Night

The Palazzirail Audit Report states in detail the processes used by DCPL to minimise train operations during the night. Having reviewed the Palazzirail Audit Report it should be noted that it identified the lack of shuttle movements on Sundays and a lower level of use on Saturdays. With regard to the lack of train movements on weekends the report states:

"Advice from DCPL and Aurizon staff is that the shuttle train typically only operates Monday to Saturday (with Saturday treated as a catch-up day) and that operation on Sundays is not practice. It is noted that the data provided by DCPL (including that on the DCPL website) indicates that between November 2012 and December 2013 the shuttle train operated on only one Sunday, 24 February 2013.

Over the period analysed a total of 13 train movements are recorded where the train has departed Duralie after 9:25 (as noted previously, the practice adopted is that the latest a train will be permitted to depart is 9:40). Given this limited number of movements, it appears possible to transport the same amount of coal yet avoid any departures after 9:25 by instituting more movements on a Saturday. However, there are no doubt a range of factors that would influence the viability of such a choice."

Based on this observation in the Palazzirail Audit Report and strictly according to the Conditions of Approval there maybe opportunity to reduce night time movements by increasing movements on weekends. However, considering a noise management perspective the issues are complex between reducing night-time movements versus operating the shuttle less days particularly on weekends. The main reason for reducing night time train movements is to reduce sleep disturbance impacts, however as there are only 13 movements after 9.25pm in the period analysed this might not be a major concern for the community when they have little noise impact on Saturdays and Sundays when the majority of the community is home.

It is WM's opinion if reduced night time movements were to be considered by increasing movements on weekends this should be done carefully in consultation with the community as there might be a community preference of having less weekend movements.

4.3 Minimisation of Braking and Horn Noise

Through consultation with on-site personnel and review of site documentation, the site personnel are aware of noise management issues such as minimising the usage of brakes and horns.

Aurizon (the operator of the Duralie shuttle train) has advised that:

- the locomotive crews have begun to introduce the standard use of the town horn (as opposed to country horn) where practicable (i.e. the country horn will be used where necessary for safety) to minimise potential noise impacts from the use of horns; and
- bunching and stretching of rail wagons through braking is minimised through drivers coordinate their braking activities via radio as part of normal shuttle operations.

Some complaints concerning the use of train horns have been noted, these are discussed further in Section 6.

5 MEASURED TRAIN NOISE LEVELS

Rail noise monitoring results, as set out in the quarterly noise compliance survey reports prepared by Vipac Engineers have been reviewed. The reports were issued in January, April, July and October 2013. The January, April and July reports only provide the levels measured at monitoring locations TN1 (Craven) and TN2 (Wards River); the results are not extrapolated to the residential receiver locations.

The October report extrapolates the results of the October monitoring to the facades of the 34 residential receivers and compares the results against the L_{Amax} 85 dBA and $L_{Aeq,15hour}$ 65 dBA noise goals. The L_{Amax} 85 dBA noise goal was predicted to have been exceeded at most of the receivers (1, 2, 4, 6, 7, 9-28, 31 and 34). No exceedance of the $L_{Aeq,15hour}$ 65 dBA goal was reported. The exceedances are typically in the 1-2 dB range. A significant exceedance of 5 dB was reported for receiver 34. It is considered that this is likely to be an error, given this receiver's further setback distance from the railway than other receivers with lower reported levels.

It should be noted that Condition 4e, Schedule 3 of the Approval requires that where landowners located between the Stratford and Duralie are affected by rail passby noise above the 85 dBA criterion, they are entitled to noise mitigation upon written request from the owners of the residences.

The noise management plan notes:

Where exceedance of this criteria is predicted to occur at private receivers based on the rail noise monitoring results, DCPL will, as soon as practicable, satisfy the associated notification requirements of Condition 2c, Schedule 4 (i.e. notify the relevant owner in writing that they are entitled to ask for additional noise mitigation measures to be installed at their residence). Validation of rail noise monitoring results will be undertaken as soon as practicable prior to notification (i.e. review of weather conditions, DCM rail movements and the calculated setback distance from the rail line where the 85 dBA criteria will be exceeded due to the DCM trains).

If applicable, DCPL will subsequently implement associated additional noise mitigation measures as specified in Condition 4, Schedule 3 of the NSW Project Approval.

Rail noise monitoring and reporting against the other rail noise performance criteria described in Section 4 will be undertaken for general information purposes only (i.e. they are not DCM compliance requirements).

It is not clear from the Vipac report, whether the rail noise predictions, based on the monitoring undertaken at TM1 and TM2, has considered the intervening terrain, or whether the calculations are based on distance only. Constructing a noise model which would take account of ground absorption and screening effects may assist in improving prediction accuracy. With consideration to the mitigation requirements, it is recommended rail noise compliance levels are validated to confirm the extent of any exceedance of the L_{Amax} 85 dBA pass-by criterion.

6 COMPLAINTS

The complaints register for the period 5 November 2012 to 31 October 2013 has been reviewed. This review has identified two complaints specifically related to noise from train operations on the North Coast railway. Both complaints were from the same complainant and the issue was the use of the horn. The details, as shown in Table 6-1, indicate that the complaints were responded to within reasonable timeframes.

Table 6-1 Relevant Complaints

Reference No.	Complainant Location	Community Hotline Investigation Record
158 26/01/2013 1.33pm	Wards River Village	Esc#108: "Coal train drivers blowing horn unnecessary noise pollution". 1. 1.38pm 26/01/13: Returned call to resident and advised that complaints regarding trains on main line should be directed to ARTC, which he said he was aware of, but wanted to advise us as we employ/engage the drivers. I advised that the company does not employ the drivers. Bruce mentioned community meeting currently being held in Wards River.
222, 26/10/2013 6.30am	Wards River Village	Esc#168: Noise from train; Callback: immediately. Tony Dwyer responded to resident. Resident advised complaint in relation to use of horn by likely a particular Pacific National driver, suggested sign to remind drivers to use town horn at crossing. TD advised resident that YAL would make PN aware of complaint and provide resident with a reply. 9.49pm 28/10/13: Email from Manager E,A & C to Tech Services Mgr (Acting GM) advising closeout, being reply to resident who seemed satisfied with advice to contact ARTC and that ARTC community person provided commitment to take up his issues with PN.

It should be note that at least one of these complaint is referring to the Stratford export train (i.e. a Pacific National train) and the other complaint record is not explicit if it was a shuttle train or not. From the review of complaints there appears to be no systemic complaints regarding the operation of the Duralie shuttle train.

7 CONCLUSION

In 2012 Duralie Coal Pty Ltd (DCPL) had its Project Approval conditions modified to extend the hours that the Duralie ROM coal shuttle train can operate between the Duralie and Stratford mines, located in the Gloucester Valley of NSW.

In accordance with Condition 9A, Schedule 5 of the NSW Project Approval, Wilkinson Murray Pty Limited (WM) has undertaken a rail haulage noise audit for 2013, to review existing rail haulage operations and determine whether all reasonable and feasible measures are being implemented to minimise potential noise impacts from the rail haulage operations. Accordingly, a site visit was undertaken by WM on 26 November 2013 to carry out inspections of the rail infrastructure located on and between the Duralie and Stratford mine sites; to conduct interviews with key DCPL personnel to evaluate the existing site management of rail noise; and to sight and review relevant environmental records and documents to determine compliance status with respect to the relevant modified approval conditions.

The summaries of findings of this audit are as follows:

- Current locomotives used in the shuttle train meet currently accepted noise objectives, in the context of the regulatory framework;
- DCPL's commitment to replacing the existing locomotives with GL Class or equivalent from Year 2 of the Project or sooner has been achieved;
- The Duralie shuttle train appears to have been operated in an efficient and well maintained manner;
- Train movements have been within the permitted limits and permitted timeframes;
- The Palazzirail Audit Report states in detail the processes used by DCPL to minimise train operations during the night. The Palazzirail Audit Report identified the lack of shuttle movements on Sundays and a lower level of use on Saturdays. It suggests *given the limited number of movements, it appears possible to transport the same amount of coal yet avoid any departures after 9:25 by instituting more movements on a Saturday*. It is WM's opinion if reduced night time movements were to be considered by increasing movements on weekends, this should be done carefully in consultation with the community as there might be a community preference of having less weekend movements;
- Noise compliance monitoring indicates compliance with the 65 $L_{Aeq,15 \text{ hour}}$ daytime noise goal at all receivers; however, exceedances of the L_{Amax} 85 dBA pass-by criterion has been indicated at 27 receivers; and
- From the review of complaints there appears to be no systemic complaints regarding the operation of the Duralie shuttle train.

With regard to recommendations from the Rail Haulage Noise Audit Report it is recommended that rail noise compliance levels are validated to confirm the extent of any exceedance of the L_{Amax} 85 dBA pass-by criterion.