

Noise

Metropolitan Coal is an underground mining operation and noise emissions are therefore restricted to surface facilities.

Noise monitoring for the Project consists of unattended and attended measurements. Real-time (i.e. unattended) noise monitoring commenced in December 2010. Attended noise monitoring commenced in September 2010.

Real-time Noise Monitoring

Real-time noise monitoring for the Project is undertaken using an unattended statistical noise logger. Real-time noise monitoring is used as an internal Metropolitan Coal noise management tool and not for compliance purposes.

The real-time noise monitoring site is located at the northern boundary of 16 Oxley Place (Figure 1).

The real-time noise monitor records noise levels 24 hours a day, 7 days a week and a graphical summary of the previous 24 hours of noise is sent to key mine staff via email on a daily basis.

The continuous recording also includes an audio function which allows the monitor to record audio of the noise signal. This audio information can be downloaded in order to allow the listener to determine whether the noise source is Project related. There are numerous other potential noise sources apart from Project noise, such as insects, frogs, local vehicles, domestic activities (lawn mowers, etc.) and wind and rain, which may influence noise monitoring results.

The real-time monitor was initially set up approximately 20 metres (m) east of the rear (eastern) residential boundary of 16 Oxley Place. Following analysis of the results the monitor was moved to be within 5 m of the residential boundary, to provide a more representative measurement of the noise levels at the residential boundary.

The results of the attended surveys conducted at 16 Oxley Place have been compared with those obtained from the real time noise monitor and good correlation was obtained between the attended results and those from the real time noise monitor.

Attended Noise Monitoring

Continuous real-time monitoring is supplemented by attended noise monitoring.

Attended noise measurements and recordings are conducted to quantify the intrusive noise emissions from the mine, including processing and transportation operations as well as the overall level of ambient noise.

Attended noise monitoring is conducted quarterly. However, additional monitoring may also be conducted in the event of ongoing noise complaints from a particular landholder/locality that requires further investigation. The attended noise monitoring is conducted at sites representative of the nearest residences to the Project that are potentially most affected by Project noise emissions. The nearest residences are (Figure 1):

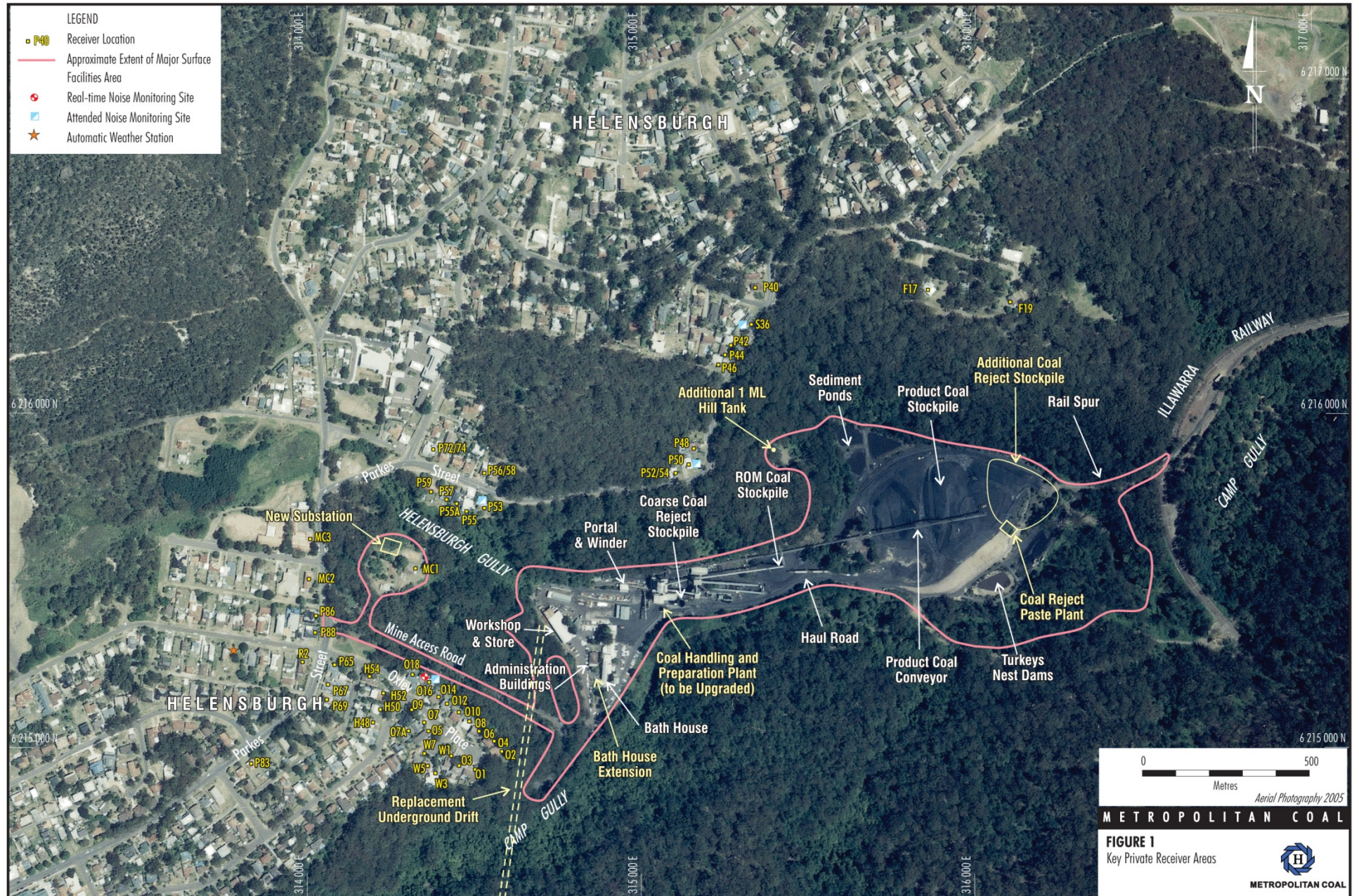
- residences to the south-west at 2 to 18 Oxley Place;
- residences to the west north-west at 53 to 59 Parkes Street;
- residences to the north-west at 48, 50, 52/54 Parkes Street; and
- residences further to the north-west at 42, 44 and 46 Parkes Street.

Attended noise monitoring was conducted for 15 minute periods during the daytime, evening and night-time periods. The monitoring was carried out on two consecutive days and nights resulting in at least two 15 minute samples for each monitoring location every three months. Daytime monitoring at residences to the south-west at 2 to 18 Oxley Place was conducted in the morning period, to include a representative number of reject and product truck movements on the Mine Access Road.

Attended noise monitoring was conducted quarterly at (Figure 1):

- 16 Oxley Place;
- 53 Parkes Street;
- 50 Parkes Street; and
- 36 Old Station Road, noting this residence is immediately adjacent to 42 Parkes Street and representative of the nearest residences in this area.

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Results from the attended monitoring program are used to verify data collected from the real-time noise monitor and to track the noise performance of the mine during the reporting period. Post-2014 attended monitoring data will be utilised to determine compliance with Project Approval noise impact criteria.

For the four quarterly noise monitoring surveys conducted within the reporting period, the intrusive equivalent continuous noise level ($L_{Aeq(15\text{minute})}$) mine-related noise levels were estimated (Tables 1 to 4). Tables 3 and 4 also present the estimated night-time $L_{A1(1\text{minute})}$ mine related noise levels for the September 2014 and December 2014 quarterly noise surveys.

Table 1
Estimated Intrusive Mine-Related Noise Levels - March Quarter 2014

Monitoring Locations	Mine-Related Intrusive $L_{Aeq(15\text{minute})}$ (dBA)		
	Day	Evening	Night
16 Oxley Place	49, 59 ¹	49, 41 ¹	46 ¹ , 41 ¹
53 Parkes Street	49, 54 ¹	48, 32 ¹	46 ¹ , 44 ¹
50 Parkes Street	46, 45 ¹	47, 38 ¹	45 ¹ , 38 ¹
36 Old Station Road	48, 45 ¹	46, 42 ¹	46, 42 ¹

¹ The Coal Handling and Preparation Plant (CHPP) was not operational during parts of the noise survey period due to unscheduled maintenance and power outages. The CHPP operated under normal conditions for the remainder of the survey period.

Table 2
Estimated Intrusive Mine-Related Noise Levels - June Quarter 2014

Monitoring Locations	Mine-Related Intrusive $L_{Aeq(15\text{minute})}$ (dBA)		
	Day	Evening	Night
16 Oxley Place	49, 49	49, 49	51, 49
53 Parkes Street	49, 50	46, 46	47, 46
50 Parkes Street	48, 48	47, 47	47, 47
36 Old Station Road	49, 48	47, 45	47, 44

Table 3
Estimated Intrusive Mine-Related Noise Levels - September Quarter 2014

Monitoring Locations	Mine-Related Intrusive $L_{Aeq(15\text{minute})}$ (dBA)			Mine-Related $L_{A1(1\text{minute})}$ (dBA)
	Day	Evening	Night	Night
16 Oxley Place	50, 56	49, 49	49, 49	52 truck 51-54 train
53 Parkes Street	47, 50	46, 46	46, 46	Non observed ¹
50 Parkes Street	46, 46	47, 47	47, 47	52-55 train
36 Old Station Road	48, 48	46, 46	47, 44	54 impact 60 train brake

¹ No short term noise events such as impact noise, truck pass-bys, train brake noise, etc. were observed during the noise survey.

Table 4
Estimated Intrusive Mine-Related Noise Levels - December Quarter 2014

Monitoring Locations	Mine-Related Intrusive $L_{Aeq(15\text{minute})}$ (dBA)			Mine-Related $L_{A1(1\text{minute})}$ (dBA)
	Day	Evening	Night	Night
16 Oxley Place	54, 51	- ¹ , 50	50, 51	52-56 train brake 58 train horn
53 Parkes Street	51, 50	- ¹ , - ²	- ² , - ²	Non observed ³
50 Parkes Street	48, 49	49, - ²	48, 48	51 train brake
36 Old Station Road	46, 48	48, - ²	45, - ²	70, train horn

¹ Measurements during these periods were not able to be conducted due to heavy rain.

² The Mine-Related Intrusive $L_{Aeq(15\text{minute})}$ could not be estimated during these periods due to the influence of wind noise and frog noise from the nearby creek during the measurements.

³ No short term noise events such as impact noise, truck pass-bys, train brake noise etc were observed during the noise survey.

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Assessment of Monitoring Results

Tables 1 to 4 show consistent estimated mine-related noise levels $L_{Aeq(15\text{minute})}$ were obtained for the four surveys from March 2014 to December 2014. The attended noise levels recorded at 16 Oxley Place, 53 Parkes Street and 50 Parkes Street were generally constant in noise level as these locations are influenced by continuous noise from the CHPP and conveyors whereas mine-related noise levels at 36 Old Station Road were more varied as a result of mobile plant such as front end loaders and bulldozers associated with the train loading operations.

An examination of the $L_{Aeq(15\text{minute})}$ results for the quarterly surveys of March 2014 to December 2014 indicates the long term mine related noise levels at the four monitoring locations is generally similar or lower compared to previous surveys. Works on the CHPP to upgrade the cladding and reduce the area of openings in the façade throughout the reporting period has contributed to the lower noise levels.

The short term noise results as represented by the $L_{A(1\text{minute})}$ noise levels for the September 2014 and December 2014 surveys show noise levels of typically 51 to 55 dBA for train and truck movements. Higher short term noise levels of 58 to 70 dBA during train horn operation, and 51 to 60 dBA for train brake operation were observed.

Complaints Records

In January 2014 one operational noise complaint was received in relation to train loading operations, and use of the train horn. Through Toolbox talks, Metropolitan Coal reminded front end loader drivers to minimise noise during loading operations. Metropolitan Coal also advised the complainant that work to reduce/eliminate train horn use on site was nearing completion. Through extensive discussions with Pacific National and regulators, new procedures have been developed to allow trains to enter the site without using the train horn. These procedures were implemented in May 2014 and included the installation of audible and visual alarms at train level crossings. Notwithstanding, in the event of a potential hazard, the train horn may still be used.

Assessment of Environmental Performance

An assessment has been conducted against the noise performance indicators detailed in the Metropolitan Coal Noise Management Plan. The assessment indicated:

- Metropolitan Coal established a quarterly operational attended noise monitoring program and real-time noise monitoring system at the site by December 2010.
- Metropolitan Coal has designed the major surface facilities fixed plant upgrades (and any associated mobile plant upgrades) to be cognisant of the material noise reductions at the site that will be required.
- Metropolitan Coal has undertaken noise modelling of the preferred upgrade design prior to construction to determine if sufficient noise reduction is likely to be achieved from the planned fixed and mobile plant upgrades.
- Metropolitan Coal exceeded the day, evening and night-time $L_{Aeq(15\text{minute})}$ noise performance indicators at 16 Oxley Place in September and December 2014.
- Metropolitan Coal exceeded the evening noise performance indicator for 50 Parkes Street by 1 dB(A) in December 2014.
- The remainder of day, evening and/or night-time noise performance indicators were not exceeded at the monitored residences.
- The attended noise monitoring performance indicators for September to December 2014 represent a significant noise improvement over the pre-Project surface facilities noise levels predicted by Heggies (2008).
- The short term $L_{A1(1\text{minute})}$ night-time noise performance indicator of 53 dB(A) was exceeded at 16 Oxley Place and 36 Old Station Road in September and December 2014, and at 50 Parkes Street in September 2014, by train operations. The exceedances resulted from operation of the train brake and train horn.

Management and Mitigation Measures

Metropolitan Coal has progressively implemented additional noise controls during the upgrade of the major surface facilities.

Noise reduction works undertaken in the reporting period at the major surface facilities include:

- Completion of the installation of Kingspan noise suppressive cladding on all walls of the combined coarse and large coal building of the CHPP.
- Completion of the installation of noise suppressive cladding on the roof of the large coal building of the CHPP.
- Completion of replacement of the coarse coal building metal roof including a 100 millimetre rockwool insulation layer underneath.
- Commencement of the replacement and repair of the external walls on the fines building of the CHPP.
- Commencement of the replacement of the external walls on the crusher building with Kingspan noise suppressive cladding.
- Fitting of a noise kit to a Caterpillar 992 Front-End Loader, enabling the resultant noise performance to be reviewed prior to the fitting of kits to other Front-End Loaders.
- Investigation of the fitting of noise kits to dozers.
- Toolbox talks for mobile plant operators to minimise noise impacts whilst loading trains.
- Completion of audible and visible alarm installation at each of the train level crossings on site as part of changes coordinated with Pacific National to cease the use of train horns on site (except in emergency situations).

Metropolitan Coal updated the Noise Mitigation Strategy for the site that identifies the key receivers surrounding the Colliery, ranks the contribution of the Colliery noise sources in each receiver area, and determines and evaluates suitable mitigation for the dominant noise sources. As a result of the strategy, cladding of the combined coarse and large coal building were implemented. Additional initiatives will be implemented in the next reporting period.