Coal & Allied – Mount Thorley Warkworth Operations

Community Consultative Committee Meeting – Monday 13 February 2017

Attendance

Chairperson	
Colin Gellatly	Independent Chair MTW CCC
Company Representatives	
Morgan Costello	Acting General Manager Operations – MTW
Andrew Speechly	Manager Environment & Community (HVO/MTW)
Community Representatives	
Stewart Mitchell	Community Representative
Kristy Hedley	Community Representative - Alternate for Ian Hedley
Christina Metlikovec	Community Representative
Graeme O'Brien	Community Representative
Adrian Gallagher	Community Representative
Council	
Cr. Hollee Jenkins	Singleton Council Representative
Observers / Presenters	
Robert Gothard	Environmental Advisor – MTW / CCC Secretary
Bill Baxter	Environmental Specialist – Rehabilitation
Mark Nolan	Principal Advisor – Project Approvals
By Invitation	
Chris Knight	Senior Compliance Officer; Northern Region - DP&E
Matthew Sprot	Team Leader; Resource Assessment - DP&E
Apologies	
Ian Hedley	Community Representative
Minutes	Sarah Purser

1. **Welcome;** Col welcomed the group and advised Kristy was in attendance as Ian's alternate. Chris Knight and Matthew Sprot from the Department of Planning will also be present at today's meeting as a follow up from member requests for an explanation of the Acquisition Criteria and to respond to questions from the CCC.

2. **Apologies;** Advised and recorded.

3. **Declaration of Pecuniary Interests / Conflict of Interest;** Ongoing; Col advised that both he and Sarah are engaged by Coal & Allied to provide the services of Chairperson and meeting note taking.

4. **Correspondence:-**
   Business Papers ahead of the February Meeting and November Meeting Minutes as "Pending Confirmation" at today's meeting.

5. **Matters arising from the previous Meeting (Actions)**

<u>Action 1</u>: Rob to seek a date from Telstra Community Specialist; Thomas O'Dea, to meet with the CCC in December 2016.

✓ ***Completed:*** *Meeting held on the 15/12/2016*

Members advised, as a follow on from that meeting with Telstra, there had been a feedback session and presentation provided to community at a meeting for residents held at the Bulga Hall on Thursday 9 February 2017.

Action 2: The Department to be invited to speak with CCC Members regarding the process and procedure for arriving at the Criteria for the Property Acquisition Zone and to answer questions regarding why the company is required to purchase one particular property but not another that may be in close proximity.

✓ ***Actioned:*** *At today's Meeting*

Action 3: MTW to include details of vegetation planted on TD1 in the next Meeting's Business Papers.

✓ ***Actioned:*** *Refer Pages 18 & 19 of the Business Papers; 9.0 Tailings Dam 1 Planting*

Action 4: MTW to get in touch with local Hot Air Balloon Operators to see if there may be an advantage in using their methods to predict wind, specifically in relation to letting of a balloon to do this, per Ian's request.

Meteorological Considerations for Hot Air Ballooning

- Hot air balloons operate in the early morning when atmospheric conditions are most stable and very predictable.
- Hot air balloon companies release helium balloons prior to the flight "to ensure they do not crash into a tree or power line".
- Operators use helium balloons because they act very similar to hot air balloons.
- They use mainstream weather prediction services such as Weatherzone Pro to predict the flight path.
- A predetermined landing "area" is then identified and a chase vehicle is deployed to assist on the landing.

Meteorological Considerations for Blasting

MTW takes into account the following meteorological considerations:

- 4-7 days – use public available forecast information.
  1-3 days – use site specific blast plume prediction model to refine the blast schedule. The model uses forecasted wind patterns and temperature inversions.
- Morning of blast – use site specific blast plume model to determine optimal time.
- Approach to blast detonation – use of blasting permissions page; including the one minute average of wind from Charlton Road, as well as wind socks around the Pit, to determine which way the wind is going.

Should MTW use Helium Balloons to help Predict Blast Plumes?

- Blast plumes and helium balloons will travel in different paths due to different densities and weights.
- On the rare occasions when the predictive model is incorrect a helium balloon will not prevent the issue.

Review of Blasting

Adrian asked if MTW do any review after the blast to determine how it went compared to what was predicted in the model. Morgan explained that the modelling currently undertaken is the best that MTW has seen, no model is 100% accurate, therefore there are also a number of additional checks undertaken as the blast gets close to detonation i.e. a review of actual conditions right there and then. Rob added there is also flagging tape on the road to identify where the wind is travelling outside of the Pit.

Graeme thought it would be routine to have the model to let the shot off and then have the actual data post-shot to compare and see how MTW went. Graeme's concern is the local impacts and felt that MTW would be better placed to convince the community that they are doing a good job if there was pre and post data from blasting to indicate this.

Hollee asked how much work would be required to do a three month comparative of blasting forecasts versus the actual blasts and if MTW capture that type of data. Morgan confirmed that MTW do capture that actual data but there would be a significant amount of work to provide that type of analysis.

Andrew explained that this would essentially come down to the part of model development, with the main part of this modelling based on meteorological (MET) data, so an assessment of this type would almost be doing an assessment against MET data, which is similar to what the Bureau of Meteorology do.

Andrew explained the model is as accurate as the mainstream weather forecast is. There are only one or two types of raw MET data used around the world, MTW uses this same raw data that is then brought in to create their model.

Morgan asked the group to be mindful that the Blast Plume Model is not used to make the decision to fire on the day of the blast, but rather to help MTW make that decision when it is assessed alongside with additional data on what is actually being measured and seen. Morgan advised that a plan to blast can be adjusted if weather conditions change from what was predicted and the company will wait for optimal wind conditions in these types of circumstances. Morgan gave the example of a blast scheduled for the previous Friday; 10 February that had not been detonated as the predicted weather had not occurred. Morgan advised that there are people making the best decisions for all given different conditions and controls and that there is not a total reliance on only the Blast Fume Model.

Graeme noted that there was reliance at some level on the Blast Fume Model and felt a post blast review may show that the company did get the blast right. Hollee felt that whenever interpreting data from the internet there is always going to be room, no matter how careful you are, for human error. Col noted that the example of the blast scheduled for the previous Friday identified there was a change from the modelling data and understands for MTW to respond to the CCC there would be the need to provide the actual context as to the decisions that were made in response to other data, not just the modelling data.

Members agreed that their interest was around the accuracy of decision making for detonating blasts and for an analysis around the conditions the company had anticipated for a blast and then what actually happened, so there could be a comparison to get a benchmark to ascertain what percentage of times the company gets the blast right and as planned. Graeme added his interest is due to there being other issues associated with blasting such as depositional dust and fumes.

Morgan reiterated Andrew's response in that this type of comparison would tend to result in the determination of the accuracy of wind data and that MTW do not solely rely on weather forecasts. When getting close to planning to fire the shot Morgan confirmed that it is people that make the decisions on that timing, if there is not the weather that was forecasted, MTW do not blast. Kristy asked if MTW photograph blasts and Morgan responded that would depend on where it was located and that most of the bigger blasts are recorded.

ACTION 1 : Col asked MTW to provide some examples of past blasts; from planning stages to detonation, and provide detail on what the Blast Fume Model had predicted along with other data that had also been taken into consideration at the time by the decision makers.

<u>Action 5:</u> MTW to provide a summary of the main conclusions from the Inter-Agency Audit Program on Dam Safety to the CCC;
Ongoing Action; Audit Report had not been received.

<u>Action 6:</u> MTW to circulate a map to CCC members, indicating where Inlet Road becomes Inlet Road west.
✓ ***Actioned:*** *Refer Page 20 of the Business Papers; 10.0 Representation of Private Residences - MTW Noise Monitoring Program.*

<u>Action 7:</u> MTW to put together some information as to the current height of Saddle Ridge and what the dump strategy will be.

✓ ***Actioned:*** *Saddle Ridge height is currently 160m. Noise will be managed in accordance with the approved MTW Noise Management Plan and the 100% sound attenuated fleet.*

Graeme felt going to the height of RL180 would be in conflict with the Mine Operation's Plan (MOP). Rob confirmed the height of Saddle Ridge is 160m, the current dump height at MTW is at RL170 and that the company has permission to go to RL180 in Warkworth. Graeme thought the dump height in the extension application was only RL160 and that there had been a subsequent application to go to RL180.

Andrew responded that there had not been a subsequent application and that all assessments and modelling were done on a dump height of RL180. Stewart noted there will also be an allowance for peaks and hollows and Andrew confirmed there will be some cross sections shown in there that peak at RL190.

Christina noted that whilst there was only a difference of 10 metres between the height of Saddle Ridge at 160m and the overburden dump due East at RL170, she felt that from the horizon the height difference to her looked to be almost double. Morgan felt this may be due to the angle of the view as well and this may look higher depending on where it is seen from.

Stewart advised the height MTW were currently working at had been starting to create problems with excess lighting around the village of Bulga, and as operations go higher this may get worse, he felt that effort should be made to avoid lighting pointing at the Village. Morgan agreed with Stewart's point of view and advised that MTW can change both the direction of lighting and the type of lighting as well.

<u>Action 8:</u> Travis to look at membership of the Cultural Heritage Advisory Group and liaise with Judith on this.

✓ ***Completed.***

<u>Action 9:</u> MTW to investigate works currently being conducted on the laneway along the edge of Mount Thorley Industrial area.

✓ ***Actioned:*** *Active Tree Services had been in the area undertaking power line easement clearing works to keep this area safe.*

<u>Action 10:</u> C&A to provide the percentage of non mining land that they own that has been leased.

✓ ***Actioned:*** *Of the ~7,614 ha of land available for rural licensing purposes there is 7,215 ha under agreement. This represents ~94.7%.*

<u>Acquisition & Mitigation Zones : Presentation by the Department of Planning (DP&E)</u>

Col welcomed Chris and Matthew from the Department of Planning, who had been specifically invited to discuss criteria around acquisitions in response to CCC interest and respond to questions around this subject. Mark Nolan advised that he had come along as well as he had worked on the approvals side of this matter, so had some understanding of the history on what had occurred from 2010 up to now regarding acquisitions.

Matthew advised he is part of the Assessment Team in Sydney who look at projects during the actual assessment time and also have a role at the post approval stage, such as in regard to Management Plans. Matthew noted that the previous CCC Meeting Minutes had discussions around acquisition rights and how they were determined and a few questions on differences between properties and nuances of how acquisition is afforded.

Matthew provided the following summary of key criteria from the NSW Government's Voluntary Land Acquisition and Mitigation Policy (VLAMP) that governs how the DP&E, as the Assessment Team, look at projects.

Acquisition and mitigation rights for mining projects

What policy governs acquisition and mining rights for mining proposals?

- The NSW Government's Voluntary Land Acquisition and Mitigation Policy (VLAMP) sets out the practices and processes for assessing and affording mitigation and acquisition rights for landowners impacted by noise and/or dust from State significant mining, petroleum and extractive industry developments.
- The VLAMP applies to all State significant mining, petroleum and extractive industry developments approved after 15 December 2014. The policy also applies to the assessment of applications to modify consents older than this date.
- The VLAMP is administered by the Department of Planning and Environment and forms part of the NSW Government's Integrated Mining Policy.
- The criteria established in the VLAMP indentify the relevant noise and dust levels that require the provision of mitigation or acquisition rights for affected landowners. The affected landowners are given the choice whether to act on these rights.
- The VLAMP also outlines the process for voluntary negotiations between a proponent and landowner/s for relevant mitigation works or the purchase of affected land.

Why do we need a land acquisition and mitigation policy?

- The VLAMP maintains and formalises the Government's long-standing processes for dealing with the impacts of mining activities on adjoining landowners.
- The policy aims to ensure that landholders are properly protected from adverse noise and dust impacts, and that industry is clear about the planning and assessment rules that apply to mining developments.
- The VLAMP provides guidance to the community, industry and decision-making bodies such as the Planning Assessment Commission about these issues.
- The VLAMP identifies:-
  - that industry needs to apply all reasonable and feasible measures to minimise noise and dust impacts;
  - the measures that need to be offered to affected landholders when impacts are predicted to marginally or moderately exceed the mitigation criteria (following the implementation of reasonable and feasible avoidance and/or mitigation measures);
  - the circumstances in which the proponent must acquire land from private landholders who wish to sell and are affected by the proposed development;
  - the noise and dust impacts that are considered to be significant enough to warrant mitigation or acquisition; and
  - that mitigation works may only be carried out on private land when requested by the landowner.
- Importantly, while the conditions of consent set firm requirements for proponents, the VLAMP is voluntary in that it does not require landowners to sell their property against their wishes.

How can landowners be confident they will receive a reasonable offer?

- The VLAMP identifies that a proponent is obliged to provide a reasonable offer for the land, which is at least equal to that calculated under the *Land Acquisition (Just Terms Compensation) Act 1991*. This offer must be made on the basis that the land is not affected by the mining development.
- In some circumstances, the conditions of consent for major developments may also include specific obligations around the minimum value that a proponent can offer for land.
- A landowner may choose not to sell their property and may instead choose to negotiate and enter into other arrangements with the proponent.
- If an agreement over the value of land cannot be reached between the landowner and the proponent, the VLAMP establishes the processes for dispute resolution.
- These dispute resolution processes are often reflected and strengthened through the conditions consent for the development.

How are voluntary mitigation and acquisition rights determined?

- The proponent is required to identify the dust and noise impacts of their mining proposal on adjoining landowners - upfront, as part of the Environmental Impact Statement.
- The VLAMP specifies the mitigation or acquisition criteria and defines a framework for dealing with circumstances where standard assessment criteria cannot be met, despite the implementation of all reasonable and feasible avoidance and mitigation measures.
- Where the proposal has residual impacts above the assessment criteria, then the consent authority will consider the social, economic and environmental costs and benefits of the project as a whole, including the extent of any residual impacts on landholders and the mitigation measures that have been put in place (including negotiated agreements).
- The consent authority may then consider whether to approve the proposal with voluntary land acquisition and/or mitigation rights in accordance with the VLAMP.

What are the assessment criteria for air quality and noise impacts?

- The VLAMP provides a detailed explanation of the assessment criteria for air quality and noise impacts associated with the proposed development. The following is a brief overview:

Noise Assessment Criteria - Impact Categories and Potential Treatments

Residual noise Exceeds criteria	Characterisation of impacts	Potential treatment
0-2dB(A) above relevant noise criteria	Impacts are considered to be **negligible**	The exceedances would not be discernable by the average listener and therefore do not warrant receiver based treatment or controls.
3-5dB(A) above relevant noise criteria	Impacts are considered to be **marginal - moderate**	May include the provision of reasonable and feasible mitigation directed at reducing the impacts of the development
>5dB(A) above relevant noise criteria	Impacts are considered to be **significant**	Provide reasonable and feasible mitigation as for moderate impacts and provide landowners with voluntary land acquisition rights.

Acquisition rights may be afforded to landowners when the predicted impacts would be more than 5 dB(A) above the project specific noise limits at a privately owned residence, or over 25% of the privately owned land where a private dwelling exists or could be built under existing planning controls.

Noise Assessment Criteria - Impact Categories and Potential Treatments

Pollutant	Averaging Period	Impact Assessment Criteria
PM_{10}	Annual	30 ug/m3*
PM_{10}	24 Hour	50 ug/m3**
Total suspended particulates (TSP)	Annual	90 ug/m3*
Deposited dust	Annual	2 g/m²/month** | 4 g/m²/month*

* *Cumulative impact (i.e. increase in concentrations due to the development plus background concentrations due to all other sources).*

** *Incremental impact (i.e. increase in concentrations due to the development alone), with zero (for mitigation) and up to five (for acquisition) allowable exceedances of the criteria over the life of the development.*

Matthew explained these criteria apply to the predicted impacts of a development and exclude extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or similar events.

Acquisition rights may be afforded to landowners when the predicted impacts exceed any of the above criteria at a privately owned residence, or over 25% of the privately owned land where a private dwelling exists or could be built under existing planning controls. They may also be afforded if the Consent Authority considers the impacts may cause unreasonable impacts at certain workplaces.

The conditions of consent for a development will also require that proponents employ all reasonable and feasible avoidance and mitigation measures for their operations so that particulate matter emissions generated by the development do not cause exceedances of the above criteria.

NSW Government - Integrated Mining Policy - Voluntary Land Acquisition and Mitigation Policy
For State Significant Mining, Petroleum and Extractive Industry Developments - 15 December 2014
Members were presented with the VLAMP; to be distributed with this Meeting's Minutes.

Matthew explained that this is a whole of NSW Government document signed out by the EPA, DRE, Planning, and is the main policy that the Department uses. The VLMPA is a concerted effort to make sure all Agencies are on the same page and that there is one document that provides guidelines on acquisition and mitigation rights, the processes on how it is afforded and the types of things you can expect from that process.

The VLMPA covers negotiated agreements, voluntary mitigation, voluntary acquisition and use of acquired land.

- ***Rights;*** the VLAMP is a governing policy for looking at affording land owners the opportunity to have mitigation and acquisition rights. This covers how these are afforded, and the processes and types of things that can be expected from those processes.

- ***Voluntary;*** means landowners have the right whether or not to exercise those things if in a zone afforded mitigation or acquisition rights.

- ***Afforded acquisition***; it is mandatory for the company to follow through with that in accordance with conditions put on the project but it is an option to the property owner and the company can only purchase land and install mitigation if the land owner requests, therefore it is a land owner triggered policy.

- ***Value of land***; covers ways this is determined and kinds of options land owners have, and the company for that matter a well, in referring that for resolution if there is a dispute over the value of property i.e. fair value. This would then be based on expert input from property valuers. The conditions of consent also talk to cost assistance with relocation and in the transaction process itself.

- ***Criteria***; this is what the Department would be looking at when doing an assessment of the project at the time the proponent put it to Government.

  When a proposal is put to Government, the mining company is required to prepare a Mining Impact Statement which includes a range of technical studies into what the baseline condition are in the area and what the predicted impacts of the project are likely to be.

  Internal technical experts will often be commissioned to review the information that is provided to the Department, to ensure there is confidence around sufficient rigor and as much certainty as possible around predictions and the reasonableness of those models. Essentially what goes to the Department's Assessments Team is an assessment of what occurs without the mine and an assessment of what would occur with a proposed project.

NOISE

- The way noise is assessed is that the assessment predicts project specific noise levels based on looking at the background noise in the area, Bulga and Milbrodale have got relatively low background noise.
- Measurements are taken of what the noise is actually like in the area and then based on that noise, the Department can develop a background level.
- That background basically is the background noise calibrated so that it meets the minimum requirement of the Policy.
- Once background noise is established, it is then determined what is the acceptable level of increase associated with the project and that comes under the Industrial Noise Policy (INP), which is the NSW Government Policy on how to assess and consider industrial noise in natural developments.
- The INP is currently under review and a new version will be coming out called the Industrial Noise Guidelines.
- The INP sets looking at the baseline and adding to that to assess a project which will create a project specific noise level.
- That is the level of noise that can be generated at any given point, usually based on a resident i.e. a house and the noise that can be generated at that property from the development.
- That provides a baseline to the Department on what is deemed to be acceptable noise under the Government policies.

- If a project is likely to have an impact on surrounding neighbours, the company needs to implement reasonable and feasible measures, as far as they can, to mitigate that e.g. building bunds and working behind earth and bund which attenuates the noise. This may be measures such as attenuating their truck fleets so these are not as noisy.
- If with those measures in place, the project still cannot make those limits, the Government works out how much they are going to go over those by and what is the significance of that for the surrounding receivers.
- If that increase in noise is deemed to be ***significant***; >5 dB(A) then the Department will afford acquisition rights to those people, they would have rights to both mitigation of their property and the right to sell if they wish.
- If the impact is deemed to be ***moderate;*** an increase of 3 to 5 dB(A) above the project specific limits then those properties are afforded mitigation rights and that mitigation needs to be directed at addressing the impact i.e. noise or dust.
- Where impacts are deemed to be ***negligible;*** a noise increment of 0 to 2dB(A), this would have been based on research that the EPA has supported in the INP, as well as global research, on the discernability of a noise increment.
- The company will provide figures to the Department that show a line on a map indicating that within a certain line there will be noise up to 35 dB(A) and then it goes out and the next line may say noise will be 33 dB(A) and it gets quieter as you get further away from the project.
- The Department looks at those lines to determine which properties are inside or outside of those lines. Those properties that fall within what is the limit and if that property exceeds, they get acquisition or mitigation rights.

Stewart felt that the Environmental Impact Statement (EIS) that came out for the latest approval for C&A did not seem to have all the detail in it as previous ones did. Stewart asked if the assessment had just relied on the 2012 application that got rejected. Stewart understands that the Department say they have got a noise level but he had not seen those graphs at all. Stewart noted that the EIS did not have an isopleth but it measured each house and indicated the numbers for each house.

Matthew advised there are two types of assessments; individual locations and isopleth diagram:-

Individual Locations

In a situation where there are a number of houses located in a line around the mine, the mine may choose to assess each location as an individual receiver and will provide tabulated data that identifies each receiver/residence and the predicted noise likely to occur at a series of times over the life of mine.

Isopleth Diagrams

These are for projects where not every house necessarily needs to be addressed or in an area where it may be quite onerous to map every single house. In this case, if there was an assessment that the first ten homes were going to be compliant, then the homes behind those would be expected to be compliant. If the first homes were not compliant then you would keep modelling out until you reach a point where you know that acquisition or mitigation would no longer apply.

Graeme has no knowledge or record of when noise was measured at his house and it was his understanding that the Approval said it had to be a certain sound level at his residence and that MTW measure sound at Inlet Road West, some 300 metres from Graeme's residence. Graeme has never seen data to justify that the noise where it is being measured is representative of what the noise would be at his residence. Matthew asked if this was for the active operations or for the purpose of prediction for the Environmental Assessment and Graeme advised this was for the current approval.

Matthew advised that in order to develop these predictions for the EA the company needs to have baseline data:-

- That baseline data comes from a number of representative locations in the area that are chosen by technical experts who are engaged to do the modelling.
- Locations that are selected are in most cases likely to be worst case scenario locations e.g. an exposed knoll where there is likely to be more noise.

In response to a question from Graeme asking where it was documented how the technical experts were supposed to their assessments, Matthew advised they would need to comply with the Industrial Noise Policy (INP) which is the EPA's document on how to develop noise models and how to predict the impacts of a mine:-

- The INP sets out the parameters that a Noise Consultant would need to follow.
- The models are then developed by those individuals who have a range of expertise in figuring out where are the most likely impacts.
- They are then reviewed, not just by other experts, but by the Environmental Protection Authority (EPA) who is the lead NSW Government agency looking at and assessing noise. The EPA will review those models as part of the Environmental Assessments so when the Department does their assessment they will send all the EIS documents out to the EPA and they will provide advice to the Department.
- If the EPA is not happy with the modelling then the Department will go back to the consultant with that response and the consultant would need to update their model e.g. that may require more background noise locations be added, more fleet or different fleet to be assessed, or justifications on what has been put into the model.
- The Department also has in house noise experts that will look at the assessment, Geoff Parnell is the Department's key noise consultant and would review any sort of noise report to the Department including parameters that had been factored in, background data and the like.

Graeme did not have a problem with how noise is assessed leading up to the approval but when it says in the approval that at his residence the noise is supposed to be a certain level but it has never been tested at that, he feels you should not be able to have it both ways. Matthew said that when it comes to post approval, with the project approved and operating, the mine would put in an array of noise monitors around the area and noted that Graeme mentioned there was one 300 metres from his location. Graeme felt it was a mobile measurement taken there. Andrew advised there is a barn owl there and that attended monitoring is also done.

Matthew advised there are a range of monitors that will be permanent, along with a range of monitors that will be attended i.e. readings taken by a person standing in the field with a monitor and using Graeme's property as the example:-

- If a mine is situated further away from Graeme's residence than the monitor, the mine can measure across a series of monitors to determine whether they are likely to impact on Graeme's residence.
- These monitors are usually run by the mine as internal guidance mechanisms, so the mine can then adjust their operations early i.e. if they hit a certain trigger of noise just off their high wall then they can start to ramp down therefore by the time that noise picks up, it drops off before it reaches Graeme's residence.
- The mine will also have a series of monitors around and if those monitors were showing that there is noise in that area near Graeme's property, then attended noise monitoring will be used, where someone goes out and determines if that noise is coming from a certain direction and from certain types of things i.e. caused by crickets or frogs that may warp whether or not it triggers. This would push a trigger before it is necessarily being caused by the mine and enable MTW to go out and determine what was the source of that noise.
- If there is noise at a particular monitor that is exceeding, indicating there could be an exceedance near there, the purpose of having a series of monitors is that once there is data from a network of monitors this data can be extrapolated. For example; having the data from a monitor and another monitor 500 metres away that had fallen by 5 dB(A), which is quite a large amount of drop, it could be expected that there is curvature drop between those areas and these model can predict in between two measured locations.

Graeme has an issue that Rio Tinto do not accept DBC as a measurement of noise and that assessments are all based on DBA's Matthew advised the consents are based on DBA's and Graeme's concern was that low frequency truck noise is a DBC. Andrew advised that DBC's are still monitored and assessed and Matthew confirmed these are still considered during the assessment phase as well. Graeme noted that there was a scaling factor applied between DBA and DBC measurements.

Adrian noted his question to the Department was in relation to houses that are only 75 metres apart at most but two are in the acquisition zone however the one in the middle is not and he wanted to know what determines why acquisition is afforded to one but not another. Matthew asked if the property in question was in the middle of two with acquisition rights and Adrian confirmed yes. Adrian felt that it was strange as the property in question is virtually surrounded by properties with acquisition rights and finds the zone tends to meander in and out so he is finding it difficult to see any logic to it.

Without knowing the location of the property in question, Matthew could not provide specific advice and was happy to take Adrian's query on notice.

Matthew was able to provide an overview of some factors in the model that may apply in this type of situation:-

- ***Terrain***; if a neighbouring property is lower down behind a ridge there might be a slight difference i.e. a meandering factor may be some form of terrain factor e.g. a funnelling of noise in that area.
- ***The acquisition threshold over 25% of a property*** whereby under the VLAMP there are acquisition rights if you exceed the acquisition threshold over 25% of a property i.e. the landholding where there is a residence or a residence could be built, then that would trigger consideration for acquisition. As an example; it could be also that the property next door might have been triggered by the back yard.

Morgan added as a proposal only, that some of the acquisition rights are due to the modelling and so on, but some of the acquisition rights are not linked specifically to the modelling because of decisions that had been made by different bodies i.e. the Planning Assessment Commission (PAC). Mathew confirmed he was across this detail as well and that the Department could look into the property that Adrian was concerned about if Andrew provided further detail to the Department.

ACTION 2: Col asked Andrew to liaise with Adrian on detail of the property that is not in the acquisition zone but is located in between two properties in the acquisition zone and pass this on to Matthew to enable him to come back with more information on this.

Overview of Acquisition & Mitigation rights for the Project Approvals in 2010 and 2014

Matthew advised that the actual projects that were approved in 2014 included modelling of air quality and noise as all projects do, and based on that modelling the Department provided acquisition and mitigation rights to a number of residences in Bulga and Milbrodale that were based on the predictions of impacts from the project. Matthew recalled there was around half a dozen properties that had acquisition due to air and noise. Most relating to air quality were up in Warkworth and most noise related were North-West of the Bulga Village. There were properties listed because they were in excess of relevant criteria in the VLAMP as part of the assessment of that project.

The previous 2010 approval was repealed and as part of the assessment of the 2014 project the Planning Assessment Commission queried and challenged why there was a difference in predicted impacts on residences. Part of that came with the changing interaction on the part of the mine and part related to things like truck attenuation.

To address any of those concerns, as part of its response to the PAC, Rio made a commitment to offer acquisition separate to the VLAMP, so above and beyond this policy they made a voluntary offer to provide acquisition rights to anyone who had been predicted for having acquisition rights under the 2010 consent. At the time of the 2010 consent the VLAMP was not a policy however this was the policy that was assessed against the project in 2014 and the project was deemed to have that list of acquisition.

Matthew noted that in the case of the property that Adrian had been enquiring about it could also be that a neighbour that got acquisition may have been under a voluntary offer from Rio and may not have had anything to do with the actual Department's assessment of the policy.

Stewart raised the Industrial Noise Policy and that the experts would have used the old INP which included low frequency noise adjustments i.e. the C-Scale and that does not appear to have happened either by the mining company not recognising it and asked if those adjustments would have been taken into consideration by the experts who did the modelling. Matthew identified that he was not intimately involved with this assessment and would have to go back and look at this in more detail, but noted that the assessment was supported by technical expert advice and that the Department would have considered low frequency noise.
Taken on notice by the Department of Planning & Environment; Matthew to provide feedback on the consideration of low frequency noise in evaluating the projects noise impacts.

Graeme advised there had been some questioning in respect of the INP in one of the versions of the EIS by a contractor that had a different way of working out noise that did not match the INP. Graeme noted that for moderate impact one of the mitigation option is for residents to get double glazing. Graeme explained his house has verandas around it, with double French doors that they like to have open. Graeme chose to live in Bulga because of the fresh air and outlook to the National Park, he personally does not want to be in a position to have to have double glazing installed and not to be able to open windows and doors and have to use air-conditioning. Graeme is concerned that the people making the suggestions for suitable mitigation may have a lack of understanding on how residents feel about these and why people had chosen to live in this area.

Matthew advised the VLAMP is the criteria that has been approved through every Government agency in NSW for assessments, so these are the criteria the Department has to apply when assessing a project. Reviews of criteria do come about periodically i.e. the noise criteria and air quality criteria are reviewed, but at the time of determination of the project, acquisition and mitigation rights are defined at the date of the consent. In this case the date the PAC approved the project is the date those rights were afforded under the consent, so they are locked in and they are approved based on the criteria of the day.

The VLAMP is the criteria that the Department has that has been developed by the various noise experts within Government and any other academic experts that they may have consulted with at the time so they are the criteria that the Department has to apply to an assessment

Community Feedback

Christina understands that there are experts that the Department works with to determine what needs to be done for the mine to go ahead in relation to covering their approval on dust and the noise, and asked if the Department ever goes out afterwards to investigate if the mine is actually following all those rules. Matthew confirmed yes.

Christina asked if residents have an issue with something and they contact the Department, could the Department look into this and provide feedback to the residents. Chris advised he is from the Singleton Compliance Team and confirmed that the Department will investigate community complaints e.g. that there is an increase in dust or noise. The Department would follow up on those by requesting a report back from MTW to say what were the levels that they had been running at recently and what were the results of their monitoring and if the company was not compliant the Department would investigate this.

Christina was concerned about some issues that were raised in June 2014, where residents had contacted the Department who had then come out to residences and these problems had been explained. Christina said that there had been subsequent emails about a number of issues that were still needing to be addressed by the Department. Chris advised that he will follow up on those matters for Christina.

✓ ***Actioned post Meeting***; Chris advised that the Department's internal governance section had made contact with Christina and a summary of the outcome is to be provided to CoI to advise the CCC prior to the next meeting.

Chris understood that there had been some progress with some mitigation offered by Rio and that the Department did work with Rio in instigating a meeting for residents. Christina's advised that residents had organised this with Travis; MTW's Community Relations representative and that both he and all the other people from the mine were extremely helpful and they did all they could.

AIR QUALITY

- The Department will get an Air quality model that will look at where trucks will be operating at various points in the mine, what activities will be occurring over the life of the project, and then predict key stages of the project.
- That air quality model then predicts the likely increase in air quality impacts for things like PM_{10}, $PM_{2.5}$, total suspended particulates (TSP) and deposited dust.
- The Department will get an assessment of the different types of air quality impacts and then based off criteria looking at 24 hour impacts, as well as the average impact over a yearly period, that assessment will look at what are the likely impacts of that project but also of all projects on a residential location.
- There are project specific impacts which are from the project on its own in isolation and then cumulative impacts which are in this area from MTW and other neighbouring mines. These are probably the three largest driving factors of cumulative air quality impacts in the Bulga Milbrodale region.
- Those assessments come into the Department from Air Quality Consultants and they will be part of the EIS . The Department will then engage their own technical assessment of those documents and will look at the inputs that went into the modelling, the MET data that goes into the modelling, the assessment of the mine staging and equipment used, to look at the reasons for those factors, and also the control measures the company may put in place for example; water trucks on the road to keep roads watered adds a control factor as it reduces the likelihood of dust leaving the site, so the company will look at those parameters and provide the Department with a model of the likely impacts based on those operations.
- When the company has factored in any mitigation and management measures in their modelling they have then committed to do those measures, these are not optional and if they are in the EIS the company has to do this because the mine is committed to make those measures to achieve the outcome they said they would achieve in the EIS.
- All these air quality parameters are considered in the assessments, they are also monitored throughout the life of the operation through a series of monitors around the mine site and they are what drives the Department's assessment.
- Some incidents such as bush fires are not within the control of the mine so there are some exceptions with the mine having to comply with those criteria. During an event such as bush fires there is a condition requiring all mines i.e. any mine in the Valley, to operate their operations to minimise off site dust. From a compliance factor any monitor in the Hunter Valley would be exceeding at that point in time because there is a bush fire and it may not be possible to say what particular mine may be responsible in those types of events.
- If there is an exceedance of predicted exceedance of these criteria over the life of the project the Department will look to provide mitigation rights to that residence.
- If you are impacted by noise then you would get mitigation measures tailored to addressing the noise impact. If you are impacted by air quality you would get mitigation rights aimed at addressing the air quality impact. For dust most likely air-conditioning and first flush systems would be offered.

Adrian asked how would it be determined where dust will be coming from, as it might not necessarily be from this mine. Matthew responded for any exceedance that is measured at a monitor, you would have to look at the meteorological data at that time, there is quite an extensive amount of MET data in the Hunter Valley, which is probably one of the most monitored locations in NSW.

There is a range of data identifying which direction the wind was coming from at the time and each of the mines will also have an array of monitoring locations that will be able to identify where the dust was coming from. For example if the wind was travelling north to south, then it could be identified the dust would be coming in from the north.

Adrian noted that there are three mines that can potentially impact on Bulga and Milbrodale and Matthew noted that is one of the reasons mines have close monitors; to try and say where has dust actually come from. Adrian felt that Mount Thorley would potentially experience a fair amount of dust from MTW and noted that a lot of dust also comes out of Wambo in south east conditions. Adrian noted that Wambo is getting bigger and there is also Bulga Coal.

Matthew provided the following example; if monitoring had gone off at a given point of time and because generally speaking over time wind generally comes from one dominant direction:-

- Therefore if Bulga was getting impacted from Wambo the wind would be blowing to the south-east, and Bulga Coals dust would also be going south-east.
- If Bulga Coal was impacting Bulga Village then the wind would be blowing to the north-west and there wouldn't be impact from Wambo.
- By looking at wind direction and wind speed that helps in determining which of the projects in the surrounding area would be the most likely cause of that dust.

Cumulative Dust Impacts

Stewart queried how serious the Department is about cumulative levels of dust and those impacts, as if there is a strong north-westerly blowing down the Valley, everything finishes up in the Village of Broke if it is picked up all the way through. The differential between pit boundaries may exonerate a particular mine, however each mine is adding to the total cumulative impact and Stewart asked what was the Departments view on that as it doesn't seem they are too concerned.

Matthew advised that one of the key drivers of acquisition rights under the policy is that it is usually not 24 hour impacts but rather annual average impacts and that is cumulative in the assessment i.e. the likelihood of impact on the property from all mines in the area and in the model.

- Models also look at re-suspension as well i.e. if dust was blown away and settled and then gets pick up by the next wind event, therefore it does factor whether or not the dust is likely to blow out of the Hunter or stay within the area. Those kinds of factors are built into the models to predict what is likely to occur over the life of the mine
- Most of the models are very conservative, they over predict their impacts because once these models are in place the mines are required to operate to meet these limits.
- If a mine is not operating to meet these limits the mine is at risk of compliance coming in and directing all sorts of modifications to their operation to meet the limits.
- Consents actually require mines to basically adjust their operations to react to current MET data in and around the project.
- Mines will have stations around their project that will tell them what the current MET data is in the area.
- If it is a windy day and it is dusty from a cumulative perspective the mine has that data and they need to adjust their operations. That will often mean that they will reduce the amount of trucks they have operating at a given point in time, they may increase the amount of watering vehicles they have out to keep exposed areas watered to try and minimise the impact from their mine to those cumulative effects.

Graeme felt the high dumps do not get that much water, however roads where the trucks travel do. Graeme agreed with Stewart's point that it is wall to wall mines all the way down the Valley. Graeme gave the example of feedback that the grapes from his property were cleaner than further north and that was likely due to the stream of north west winds through the winter season that just carries the dust straight down the valley. Graeme noted you would not be able to identify what bit of dust came from what mine and that this all adds to a cumulative issue.

Stewart felt that annual averages are unreasonable as in the spring time there can be two months of strong north-westerly winds blowing here and that is when dust gets moved around. Stewart felt if measurements were taken during this period, these would definitely exceed safe health levels at that time but because this data is averaged out across 12 months, it is deemed to be satisfactory.

Matthew responded:-

- That is why there are 24 hour limits and annual average.
- The annual average limit is based on long term exposure.
- A 24 hour limit is based on what is permitted in the short term.
- Therefore the 24 hour limit is higher but there are only so many short term high impacts that could be had before the long term impact is suddenly affected and a mine would need to basically shut for months to accommodate that.
- If a mine had consistently high 24 hour impacts for months at a time then they would also need months at a time where they basically had no impact to account for that and to adjust it back to an annual average.
- That is why short term impacts are recognised. 24 hour impacts are what manages mines to make those limits because they address the short term impacts and the annual addresses the more long term exposure impacts.

Graeme gets frustrated about some types of mitigation that gets offered e.g. fitting first flush systems. Graeme already fitted first flush when he renovated his house along with some other residents because people are aware of how much dirt and muck is on the bottom of water tanks. Graeme noted that Rio to their credit have offered a program of cleaning out water tanks and Andrew confirmed there was a list of residences to be done.

Graeme felt that with the way dumps are changing i.e. their heights, locations and orientations, he is suggesting this is having an impact on where dust is going and was concerned that contemporary measures will not necessarily match historical measures for a given wind direction and strength. Graeme felt this presents a difficulty in predictions and was unsure how this could be accommodated.

Matthew advised the contemporary measures is that the dumps have been assessed and the current project as it is proposed was assessed as it is proposing to run:-

- The assessment that was done in 2014 would have looked at acquisition and mitigation measures based of that specific mine plan. The fact that it is different to the former mine plan, the measures of mitigation and acquisition rights in the current consent would have come from assessment of that specific mine plan.
- They may be different measures to what would have been approved under a different mine plan but the mine plan that the company has to abide by is the mine plan that they have lodged.
- If a mine wants to change their mine plan significantly enough to cause any impact on the modelling then the mine would need to modify their mine plan with the Department. That would come in and the Department would re-assess based off that mine plan what the likely acquisition and mitigation requirements are.

Matthew advised with regard to the first flush, this would have been an historic measure from an old mine consent, or as noted that were put in voluntarily. The only thing the Department can do and enforce on a company is to implement measures that are required at the time the consent is granted.

Graeme noted that the approval for the mine's extension had been knocked back in the Land & Environment Court and the Supreme Court of Appeal. Graeme felt that approval had then been given by the PAC to what he felt was effectively the same project. Graeme understood that Saddle Ridge was to have been kept as an off-set area and this would have acted as a protection bund for both dust and noise into the Bulga Village.

Graeme was concerned that there was no mention about $PM_{2.5's}$ in the summary of the VLAMP as these are what potentially impact on lung capacity, he noted $PM_{10'S}$ are heavy so tend to drop early and $PM_{2.5's}$ travel further. Matthew advised that $PM_{2.5's}$ are not a basis for mitigation and acquisition in the current policy. Graeme was not concerned about the relationship of $PM_{2.5's}$ with mitigation, his concern was that $PM_{2.5's}$ are not monitored because they are the ones that cause the health issues. Matthew confirmed that they are monitored and they are assessed. Graeme asked where recordings of $PM_{2.5's}$ were published and Andrew advised there are $PM_{2.5}$ monitors in both Singleton and Muswellbrook and agreed with Graeme that $PM_{2.5}$ can travel long distances.

Col thanked Matthew and Chris for meeting with the CCC and providing an explanation and overview on land acquisition and mitigation.

6. Company Reports – Morgan Costello, Acting General Manager : Overview of activities

6.1. Operational Update

- Last year's production for the mine hit just above plan at 12 million tonnes of saleable coal.
- 2017 plan is consistent with 2016.
- There was an increase in coal price out of NSW in late 2016 which was of benefit to the operation.
- Since that time, price has come back to US$80 per tonne which is more in line with historical prices.
- MTW is still on plan for four new Haul Trucks in July and Aug, increasing the fleet to 80 Haul trucks and that is all the additional truck capacity anticipated for this year.
- Construction/closing works on Tailings Dam 2 have commenced this year. TD2 is located on the northern extent of the operation and works will continue into next year. This Tailings Dam is no longer in use and MTW are rehabilitating it so as not to generate dust in that area. There is a significant amount of work to cap this Dam.
- Operations continue to mine in the South Pit with the plan to wrap up mining there this year. Once coal extraction in South Pit has been finished, it will be a waste placement and MTW will continue to put material in there.
- Mining of Loders in Mount Thorley will continue until 2019.
- After that; West Pit and North Pit will be the long term future of mining operations.

Stewart noted that South Pit had been operating for 30 years and when mining finally finishes he hoped that it could be rehabilitated. Morgan advised that currently the front of the mine is what MTW are working to rehabilitate and advised he will speak on rehabilitation later in his update.

Adrian asked if the continuation of Loders Pit to 2019 was an extension. Morgan responded that South Pit will complete this year and that Mount Thorley was always to continue on. Depending on plans and the impacts of weather, pumping and sequencing Loders Pit may be completed late 2018 or early 2019.

Hollee asked if the trucks expected to come in July and August will already be noise attenuated. Morgan responded these Caterpillar 795's will be coming out of the manufacturers factory noise attenuated. The supplier did all their learning at C&A and the attenuation will be applied to the same level as those attenuated by C&A.

Adrian asked if there was a shovel working at Mount Thorley as he had noted noise of an evening that sounded like a banging bucket door. Morgan confirmed Shovel 342 that has a dipper on was working there and that is planned to come out of the mine later this year. Adrian can normally pick up where equipment is located but found it a bit hard to tell for this one that is causing a bit of a noise issue.

MTW General Manager

Morgan advised that Mark Rodgers, MTW'S General Manager, had moved into a different role in Rio Tinto and with Morgan being the Acting General Manager. At the time of this meeting Morgan was expecting advice on the appointment of a General Manager and would advise the CCC on this.

Andrew Speechly provided the below email advice to members on 17 February 2017:-

Dear MTW CCC members

As Morgan Costello foreshadowed at the last CCC meeting a replacement for Mark Rodgers has been announced. Colin Mackey will be taking the role of MTW General Manager. Colin has been with Rio Tinto for some time including work in the Hunter Valley. Colin starts Monday and will be keen to meet you all once settled into the role.

Regards, Andrew

Agreed Sale of C&A to Yancoal

Rio Tinto announced sale of 100% of its ownership in Coal & Allied to Yancoal Australia.

- This includes Mount Thorley Warkworth, the Hunter Valley Operation and its share in Port Waratah Coal Services.
- Yancoal is a well established Australian company Head Quartered in Sydney with nine owned or managed sites, including five in NSW.
- A great detail of further public information on Yancoal can be found on their website.
- The proposed sale was for US$2.45 billion in recognition of the value of the C&A brand and quality of the resource.
- When the sale completes, all Coal & Allied assets, contracts and employees will transfer to Yancoal

Hollee noted that this would also include all ongoing development consent conditions and that Yancoal will still be bound by the current consent. Morgan responded that is correct.

- Sale completion is expected for the second half of 2017. The process involves a lot of approvals that are going to be Government type approvals, then a lot of share holder approvals as well, these are outside the control of the business so the time line is not a surety but anticipated for the second half of this year.
- There is a lot of organising and preparation on the business because C&A are reliant on Rio for a lot of support services and if Rio Tinto are no longer the owner they will not be able to offer those.

Stewart asked then until such time that the business actually officially changes hands that Rio Tinto still own it. Morgan confirmed that this is right and that it is business as usual until the sale completes, therefore all of Rio Tinto's and C&A'S policies that exist, any commitments that Rio Tinto has made as the Owner/Operator, they will continue through. Any legal requirements through the consent no matter who owns the business whether it is Rio Tinto or Yancoal, if C&A have a commitment then C&A will follow on with that commitment.

MTW will continue to focus on safely operating the mine, meeting their commitments and achieving planned production whilst Rio Tinto owns the business. MTW will continue to recruit roles that need to be filled, they have not stopped hiring and will continue to recruit the same as normal. Any Acquisition or Mitigation rights will all hold true. When closer to transition or completion of the sale, the company will introduce Yancoal representatives to people including this committee.

Hollee asked when MTW received notification that this sale was in the process as she had asked Mark Rodgers if negotiations with Yancoal were taking place. Morgan responded that official notification that the sale was completed, that everybody had agreed and signed off, was on Tuesday 24 January 2017 and that was the date the public announcement was made. Christina acknowledged that Andrew had sent email advice to the CCC that evening. Morgan advised that because Rio is a publically listed company when information is released it has to be released to everybody at the same time, so nobody is seen as having an advantage around ownership and the rest. Therefore when C&A knew it was done that was when the company communicated and what may or may not happen because somebody is having a conversation was something C&A could not have said.

Apprentice Intake

- 2017 Apprentice Intake 11 in total
- 8 School Leavers and 3 Mature Aged
- 3 Indigenous
- 6 Electrical and 5 Plant Mechanic
- 5 HVO and 6 MTW
- By Postcode; Newcastle : 2, Maitland : 5, Singleton : 2, Upper Hunter: 2

Graeme queried what proportion having completed an apprenticeship remain in the business. Adrian advised he had had a lot to do with apprenticeship intakes and felt a lot depended on the state of the business at the time. Morgan advised that every apprentice that qualified had a full time offer bar one who did not qualify in an off-site exam and will be going back to re-sit this.

Stewart felt it was disappointing that there were only two appointed from Singleton out of the 11. Hollee agreed with Stewart that out of all the Singleton school leavers that applied only two were successful and felt there must have been more than two from Singleton that applied. The CCC indicated interest in how many people had applied for apprenticeships by postcode.

Morgan agreed that he would like to see more people from Singleton on the apprenticeship list, noting that the apprenticeships offered was through a fair system, people that met the criteria got an interview and there was a panel that selected those best suited for the business, most deserving and who would do the best job.

Hollee was concerned that 8 of those school leavers will be P-Platers travelling to Newcastle and Maitland and therefore potentially driving a long distance after a 12 hour shift. MTW confirmed that the company has Fatigue Management Guidelines and do not consider applicants for shift work from people if they are over 60 minutes from the operation. Kristy felt there was the potential for some apprentices to move to Singleton or closer after obtaining the position and also that some mine workers that lived in Singleton had chosen to move to Newcastle when the expressway opened.

Hollee would like to see a more concerted effort from Rio and could not fathom that potentially five people from Maitland were that much better than the Singleton applicants. Graeme noted to make that type of comparison you would need to know the number of applicants from each area.

Stewart felt Rio had a bad habit of not giving preferential treatment to people in the local Government area (LGA) and that something like 35% of staff at C&A reside in this LGA. Stewart can understand why people would not want to live in an environment like in this area when they could live in places such as Lake Macquarie or Maitland. Stewart would like to see preferential treatment given to employing locals over people from long distances and he had felt that was a Rio Policy.

Hollee felt a company that is in this LGA should be providing jobs for the local people who are impacted on a daily basis by the effects of the mine.

Safety

One injury this year; 25/01/17 – CHPP maintainer laceration to index finger requiring stitches

Production

MTW are planning on doing what they did last year again this year i.e. about the same amount of coal moved and about the same type of material moved.

Stewart queried the strip ratio and Morgan responded that is about 5 1/2 to 1 for ROM coal and about 7 1/2 to 8 for saleable product which is about the same as in the past.

2016 Rehabilitation

Rehabilitation target for 2016 = 83.3 ha / Actual completed 84.9 ha

Works completed 2016:

- ✓ 117.6 ha bulk shaped
- ✓ 90.6 ha topsoiled
- ✓ 95.9 ha composted
- ✓ 84.9 ha seeded

2017 Rehabilitation

Rehabilitation target for 2017 = 122 ha

- ✓ Currently targeting the South Pit area; shaping South Pit South, filling and shaping the Training Ground Road.

MTW's target this year is to get rehabilitation done on areas at the front of the mine that can be seen. MTW has some of these areas dumped and are getting it knocked down to try and get this rehabbed as quickly as possible.

Graeme felt that the front of the mine looks artificial, that it is too perfect, not like a natural landform but felt that it was good that rehab was happening. Morgan responded that MTW will try and get it done as quickly as they can and were doing everything they could to meet the 122 ha target this year.

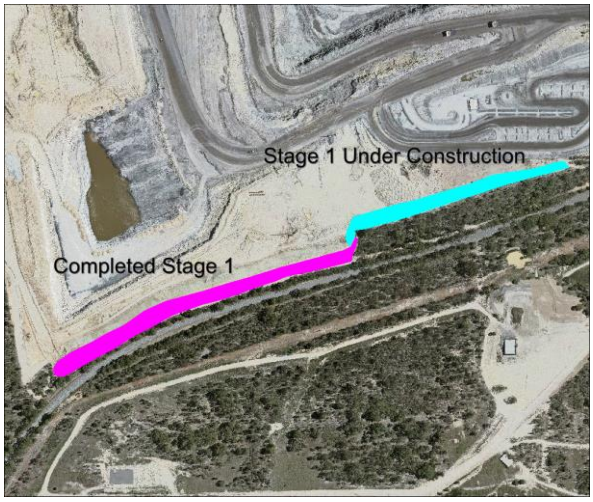
Stewart was concerned from the Environmental Report, that disturbance had once again exceeded rehabilitation. Andrew confirmed the aim is to match rehabilitation and disturbance or even do more but in 2015 MTW did not do the disturbance that was planned. MTW did not reduce the amount of rehabilitation because of that but kept rehabilitation the same, so some of the planned disturbance was therefore done in 2016.

Putty Road Underpass

- Expected start date in March
- Awaiting final approval from the RMS

Visual Bund

- The completed section of Stage 1 has been hydro-seeded
- Construction of the bund is continuing to the east ~10m of vegetation retained in front of bund



The Visual Bund will continue as operations are going along. Morgan advised some greening had been seen however MTW will have a look at that area again as with the dry weather it had been difficult for the seed to take and the company would like to get this area greening up again as soon as they can. Graeme suggested potentially watering this area with a spray cart as long as it that would not be too heavy and potentially wash material off. Andrew advised MTW are working to close off the Eastern part and then will head back to the West.

Sound Attenuation Program

All attenuation was completed by 2016 as was the company's commitment.

All operations assets are noise attenuated as will be the case with new equipment coming on site.

MTW Fleet Percentages Fitted with Full Sound Kit				
Trucks	Water Carts	Dozers	Excavators	Drills
100%	100%	100%	100%	100%

Operational Downtime

2016 = 2894.1 hours / 2015 = 8418.1 hours

The number of times noise was over the trigger level had come down a long way as a result of attenuation and this substantiates that attenuation is working and equipment is getting quieter.

Noise

	# CRO Assessments	# Individual assessment above trigger	# Nights above trigger
YTD 2015	7372	226	74
YTD 2016	5767	97	39

NSW Environmental Protection Authority v Warkworth Mining Ltd

Date set for 17th February 2017

- Partial sedimentation dam wall failure at WML under Wallaby Scrub Rd in January 2016

Morgan advised this was around dam design and consequences around that i.e. risk assessments and the like. As an action from this issue the company had reviewed EPA guidelines and looked at all other dams on their property and made sure all of EPA's expectations had been met throughout all of C&A's existing dams.

Singleton Council Meeting 20th February

Things being considered at this meeting will be:-

Application to close Wallaby Scrub Road

- VPA will be considered

Col called for confirmation of the 14 November 2016 Meeting Minutes, no member feedback was put forward and these Minutes were adopted. Col asked that Community Feedback be the next item on the Agenda.

7. Community Feedback

Christina

Christina asked if the company could narrow down blast times to within about half an hour before detonation and if so could local residents go on a phone list to be advised by text message if they wanted to e.g. to say a blast would be occurring between 12.00 and 2.00. Andrew advised that HVO were currently trialling a system like that to see if it will work and if this is successful the company could see if they can adapt this for MTW. Andrew asked if members would be most interested in notifications for road closures and the group responded yes. Andrew advised it would be a signing up process to these receive notifications.

ACTION 4: MTW to provide further detail on the community notification system being developed for HVO with the view that it may be possible to adopt this at MTW for Road Closure notifications.

Stewart

Stewart noted that at the 8 August 2016 Meeting, Cr. Sue Moore had asked that the CCC be advised of any dealings going on between the Mining company and other Government organisations, which Stewart presumed would include Singleton Council, in relation to Wallaby Scrub Road and that he had not received any advice.

Christina advised that many people had been aware of meetings with Mark Rodgers and Council's General Manger with reference to closing Wallaby Scrub Road and yet none of the CCC had been informed. Christina clarified that Cr. Sue Moore had proposed at the August meeting that the CCC needed to be inclusive of what was going on if the mine was meeting with Council in relation to Wallaby Scrub Road. Hollee confirmed there had been meetings and correspondence with regard to Wallaby Scrub Road but as Stewart and Christina were saying, this hadn't filtered through to the CCC. Col asked for the company to look at what they believe fits that action, in terms of any update on the application for closure of Wallaby Scrub Road.

Andrew had understood this request from Cr. Sue Moore talked about reporting the future plans for Wallaby Scrub Road and that MTW had advised that closure was essentially the plan. Andrew asked if the expectation would be that MTW advise about Council Meetings they have on occasions.

Morgan advised that MTW would certainly communicate, as he had just done at today's meeting, if there is any decisions or meetings around Wallaby Scrub Road and as such he had advised of the next meeting with Council on 20 February 2017 and that MTW had certainly talked to the CCC that the plan for the road was to continue to close it and around all decisions that had been made.

ACTION 5: MTW to keep the CCC up to date in matters pertaining to C&A's application to Singleton Council to close Wallaby Scrub Road either at a meeting or out of session should there be any update outside of two weeks prior the next CCC Meeting.

Stewart would like the Meeting Minutes re-distributed after the comments period close with the understanding that this version would be the final minutes, just not approved, as they would be adopted at the next meeting. Andrew noted that at the Bulga Community Meeting on 9 February there had been some feedback about better access to the Meeting Minutes by the wider community, such as where do they find them, and timing on availability.

Andrew asked if the Minutes could be distributed as Endorsed by Chair prior to being approved at the next meeting and Col agreed to that. Andrew put forward then that the Minutes be released as "Endorsed by Chair - Pending Confirmation" after the comments period close. This would still afford the opportunity for member feedback at the subsequent meeting and expedite access to the wider community.

ACTION 6: Meeting Minutes to be re-distributed to members after the comments period close as "Endorsed by Chair - Pending Confirmation". The current process of ratifying them at the subsequent meeting is to remain in place.

Graeme advised that it can be difficult to navigate around the company's website to locate the Minutes and Col asked if MTW could provide some tips / instructions for this to afford easier access.

ACTION 7: MTW to provide some instructions to the community to locate the CCC Meeting Minutes on C&A's website.

Stewart asked if the company could provide the date of the commencement of the development of this mine extension and if that related to the date of approval or date of digging. Stewart felt this would have been around June 2016. Andrew confirmed this related to there being mining activity and Morgan advised MTW could take this on notice and come back on that. Stewart advised his query relates to all the Management Plans that were to be prepared in a given time frame and asked if they had all been completed now. Andrew confirmed, yes.

Graeme

Graeme was interested in a response to Hollee's question at the November Meeting regarding a breakup of employee numbers and where they were living.

ACTION 8: In response to a request from Hollee, MTW to provide a report back to the CCC to determine how many residents of Singleton and within the 2330 postcode are directly employed at MTW, along with the major sub-contractors i.e. Skilled and TESA, mainly in relation to operational staffing.

Adrian

Adrian noted cleaning of water tanks by C&A had been well received. Andrew confirmed there were a large number of tanks to be scheduled for the cleaning, he asked if community enquire about this, that the CCC please give feedback to people that it is happening.

Hollee

Hollee has an ongoing concern about employment for people living in the 2330 postcode and was extremely disappointed that reflected in the apprenticeship intake at less than 25%.

8 General Business

8.1 Focus Topic: Offset Management :

Presentation by Bill Baxter : To be distributed with Meeting Minutes

Stewart asked if C&A had paid the $1M bond for Warkworth Sands and Bill confirmed, yes. Stewart asked if there was money for the Honey Eater too and Bill confirmed yes that was for research on this bird. Stewart asked if the results of the New England University trials had been released and Bill responded the University is progressively publishing papers. Stewart recalled that it was only a five year trial and that was two or three years ago and is still waiting to see a report on it. Bill agreed he would like to see more papers on this trial as well.

9. Future Dates

9.1 Next Meeting; 8th May 2017, 2.00 to 4.00 p.m., Warkworth Boardroom

Focus Topic Suggestions

Col asked members for areas of interest and noted that there was clearly interest around employment in the LGA for apprentices, workforce and major contractors / labour hire and what the related postcodes were. Graeme would like to know the breakdown of numbers that applied for apprenticeships by area.

ACTIONS ARISING FROM THIS MEETING

Action	Page	Description
1	3	MTW to provide some examples of past blasts; from planning stages to detonation, and provide detail on what the Blast Fume Model had predicted along with other data that had also been taken into consideration at the time by the decision makers.
2	10	Andrew to liaise with Adrian on detail of the property that is not in the acquisition zone but is located in between two properties in the acquisition zone and pass this on to Matthew to enable him to come back with more information on this.
3	18	MTW to keep the CCC posted on the commencement of works on the Putty Road Underpass.
4	20	MTW to provide further detail on the community notification system being developed for HVO with the view that it may be possible to adopt this at MTW for Road Closure notifications.
5	20	MTW to keep the CCC up to date in matters pertaining to C&A's application to Singleton Council to close Wallaby Scrub Road either at a meeting or out of session should there be any update outside of two weeks prior the next CCC Meeting.
6	21	Meeting Minutes to be re-distributed to members after the comments period close as "Endorsed by Chair - Pending Confirmation". The current process of ratifying them at the subsequent meeting is to remain in place.
7	21	MTW to provide some instructions to the community to locate the CCC Meeting Minutes on C&A's website.
8	21	MTW to provide a report back to the CCC to determine how many residents of Singleton and within the 2330 postcode that are directly employed at MTW, along with the major sub-contractors i.e. Skilled and TESA, mainly in relation to operational staffing.

Ongoing Action; MTW to provide a summary of the main conclusions from the Inter-Agency Audit Program on Dam Safety to the CCC.

Taken on notice by the Department of Planning & Environment; Matthew to provide feedback on the consideration of low frequency noise in evaluating the projects noise impacts.

COAL & ALLIED
Managed by Rio Tinto Coal Australia

EEC Re-establishment

More than 500 hectares of grassland area to be planted and managed for over 15 years to restore two different Endangered Ecological Communities:

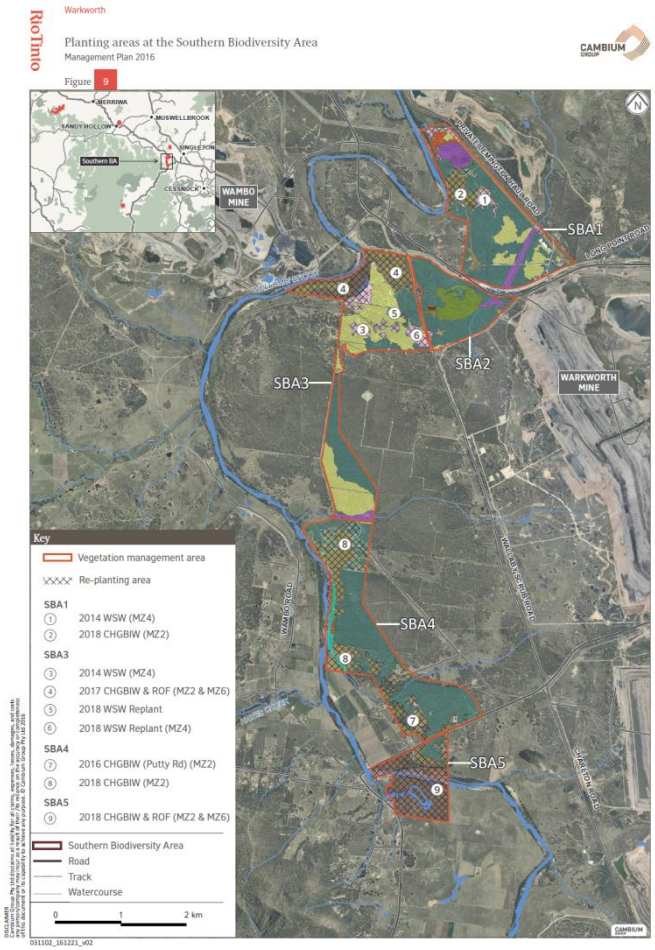
- Central Hunter Grey-Box Ironbark Woodlands; and
- Warkworth Sands Woodland on sand dunes previously cleared by agriculture.

Planting intends to mimic nature by planting in patches and strips to connect existing remnant vegetation.

Warkworth sand is salvaged ahead of mining activities to assist restoration.

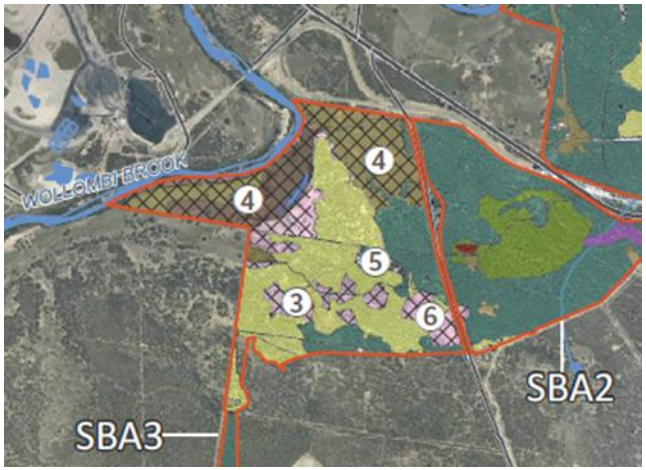
COAL & ALLIED
Managed by Rio Tinto Coal Australia

2017 Planting - MTW Southern Biodiversity Area



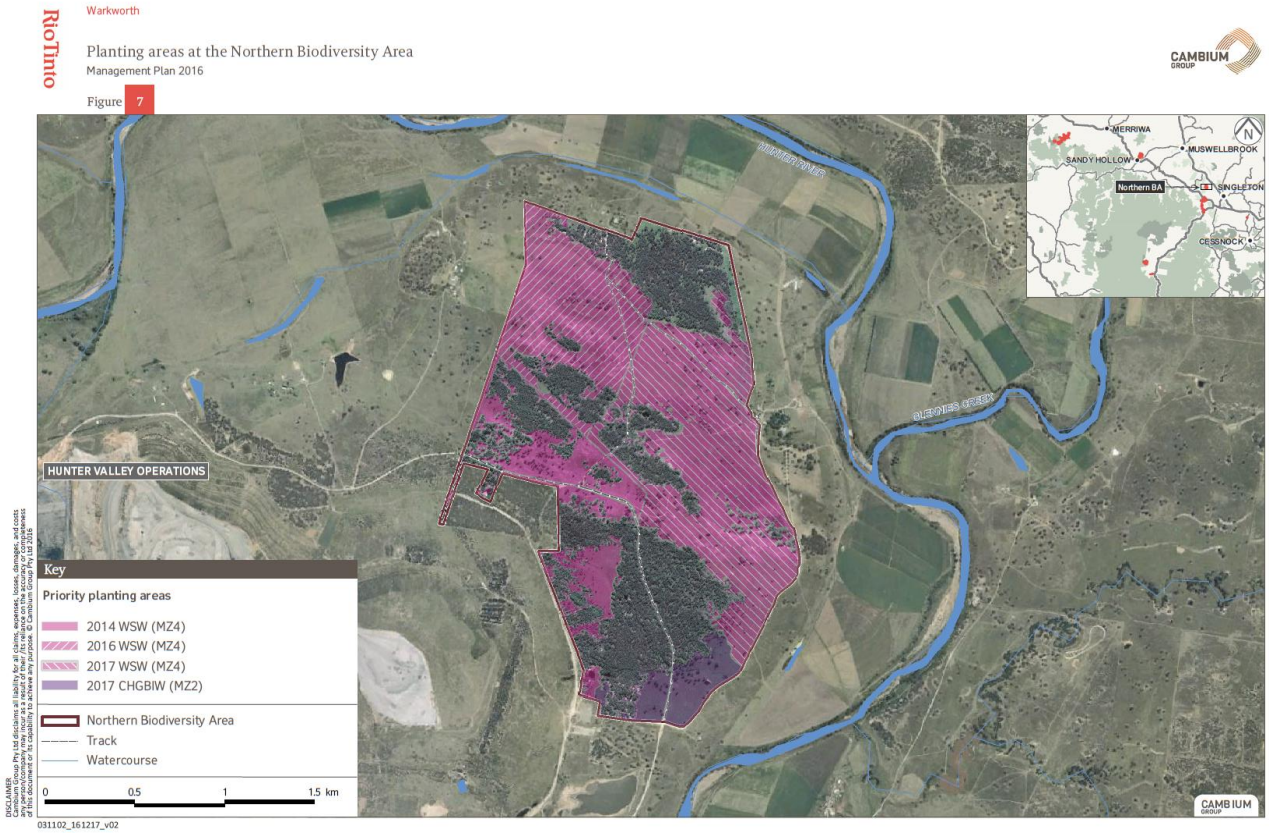
SBA3 Autumn Planting (4)

- 1ha Warkworth Sands Woodlands
- 77ha Central Hunter Grey-Box Ironbark Woodlands
- 11ha River Oak Forest



COAL & ALLIED
Managed by Rio Tinto Coal Australia

2017 Planting - MTW Northern Biodiversity Area

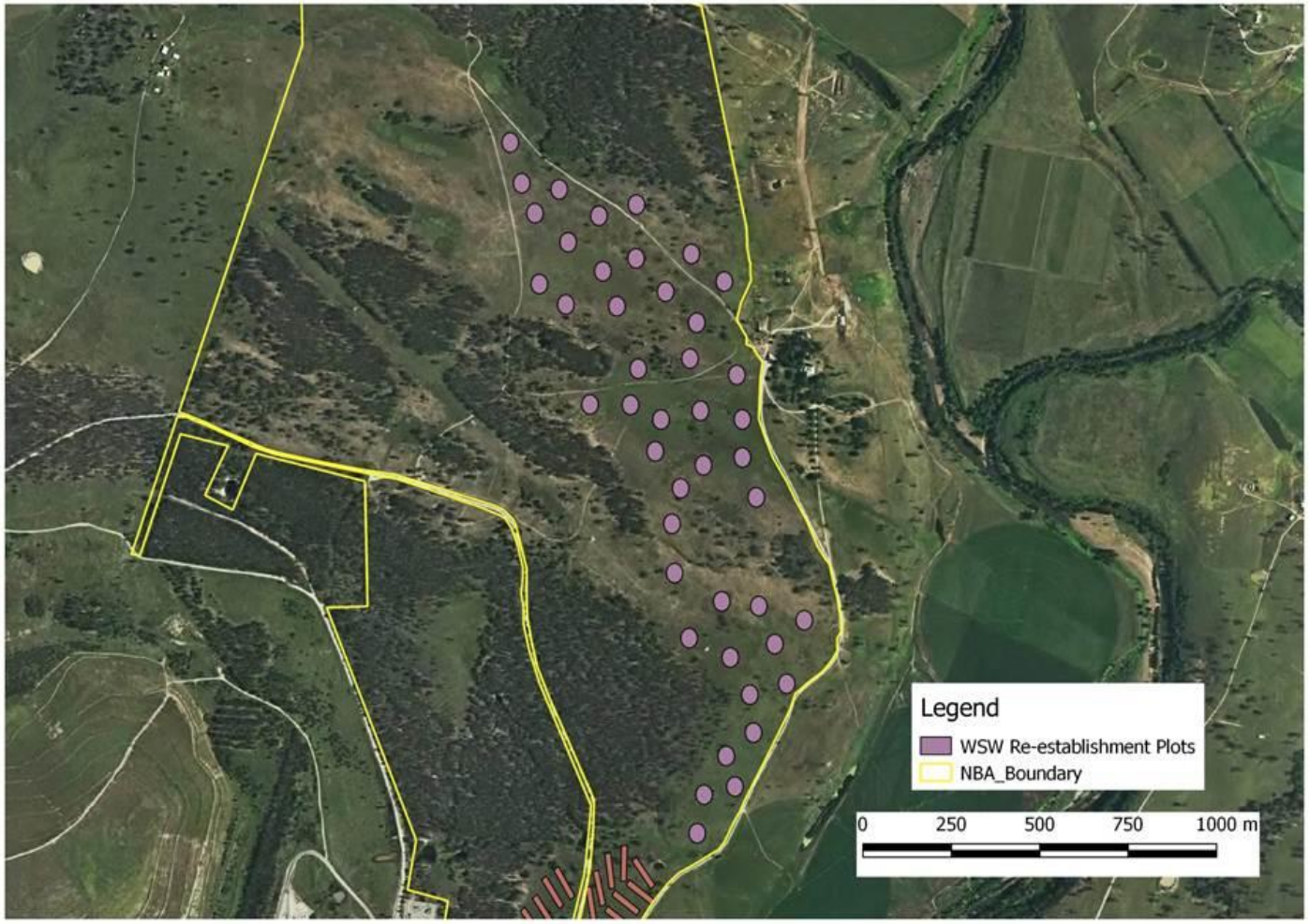


Autumn Planting

- 100ha Warkworth Sands Woodlands
- 23ha Central Hunter Grey-Box Ironbark Woodlands

COAL & ALLIED
Managed by Rio Tinto Coal Australia

2017 Planting - MTW Northern Biodiversity Area



COAL & ALLIED

Managed by Rio Tinto Coal Australia

Salvaged Topsoil Patches - Increased Tubestock Growth

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Salvaged Topsoil Patches - Increased Tubestock Growth

COAL & ALLIED

Managed by Rio Tinto Coal Australia

The critically endangered regent honeyeater has been found breeding at the Goulburn River offset area. To find up to 10 birds nesting, including four juveniles is an extremely important discovery for the species.

Two swift parrots, also critically endangered, were recorded at the Southern offset area, as part of our ongoing monitoring programme.

Mount Thorley Warkworth manages over 4,000 hectares of biodiversity offset area to protect regent honeyeater and swift parrot habitat, as part of the approval for continued mining at Mount Thorley Warkworth.

Photo – Murray Chambers

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Mount Thorley Warkworth

Community Consultative Committee

Business Papers – February 2017

Materials ahead of meeting of the committee on 13 February 2017

Contents page

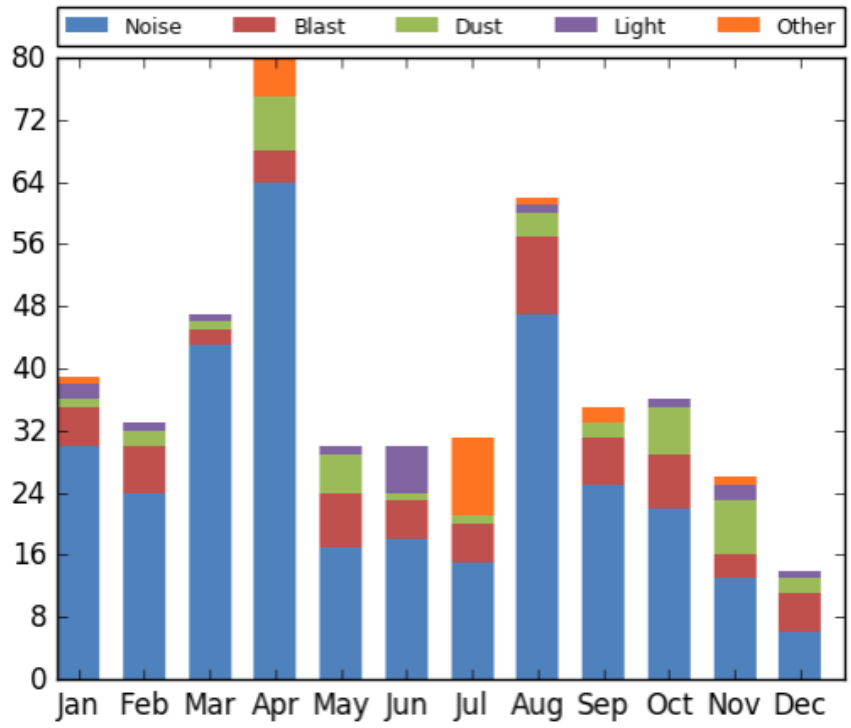
Appendices

1.0 Complaints

Complaints overview for period 1 October to 31 December 2016

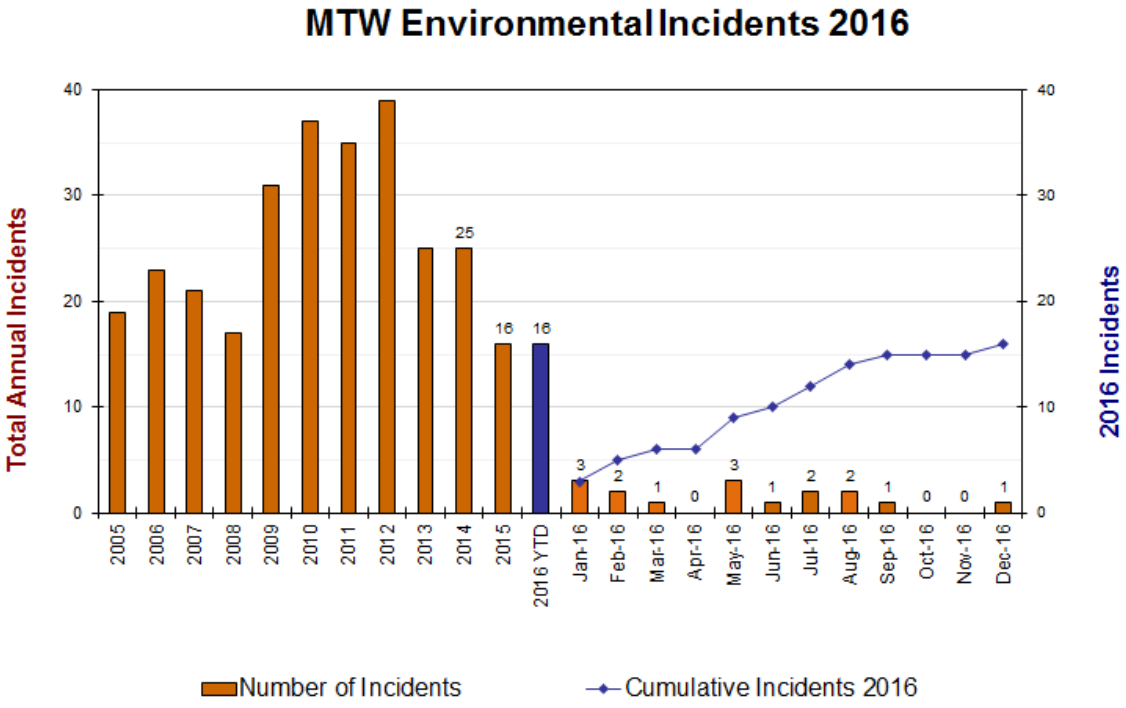
Mount Thorley Warkworth Monthly Complaints Summary

	Noise	Dust	Blast	Lighting	Other	Total
January	30	1	5	2	1	39
February	24	2	6	1	0	33
March	43	1	2	1	0	47
April	64	7	4	0	5	80
May	17	5	7	1	0	30
June	18	1	5	6	0	30
July	15	1	5	0	10	31
August	47	3	10	1	1	62
September	25	2	6	0	2	35
October	22	6	7	1	0	36
November	13	7	3	2	1	26
December	6	2	5	1	0	14
Total	324	38	65	16	20	463



2.0 Incidents

Overview of environmental incidents for period 1 October to 31 December 2016



Incident summary for the period 1 October to 31 December 2016

Date	Details	Key Actions	Aspect
02-December-2016	**North Pit Level 3 Fume Event Migrated Offsite** Visible fume was generated from a blast fired in the North Pit of the Warkworth Mine (WML) at 11:15am. The fume was ranked as a 3 event on the AEISG. An unexpected wind change from a NNW to an E occurred approximately 6 minutes after the blast was initiated causing the fume cloud migrate to the West, passing first over Wallaby Scrub Road through maintained road closure and travelled across lands owned by MTW toward the Putty Road. The plume left the MTW premises, crossing the Putty Road (east of the Bulga Bridge and outside the closed section of road) and Wollombi Brook at elevation, and dissipated on lands owned by MTW to the east of the Putty Road. The incident was notified to the DP&E and NSW EPA.	Incident investigated. The cause of the blast fume was investigated however a precise cause could not be established. The Product Supplier reviewed the blast design and was satisfied it was appropriate for the conditions.	Air

3.0 Environmental monitoring

Monthly summaries of environmental monitoring for the period 1 October 2016 to 31 December 2016

October 2016

Attached as **Appendix A**

November 2016

Attached as **Appendix B**

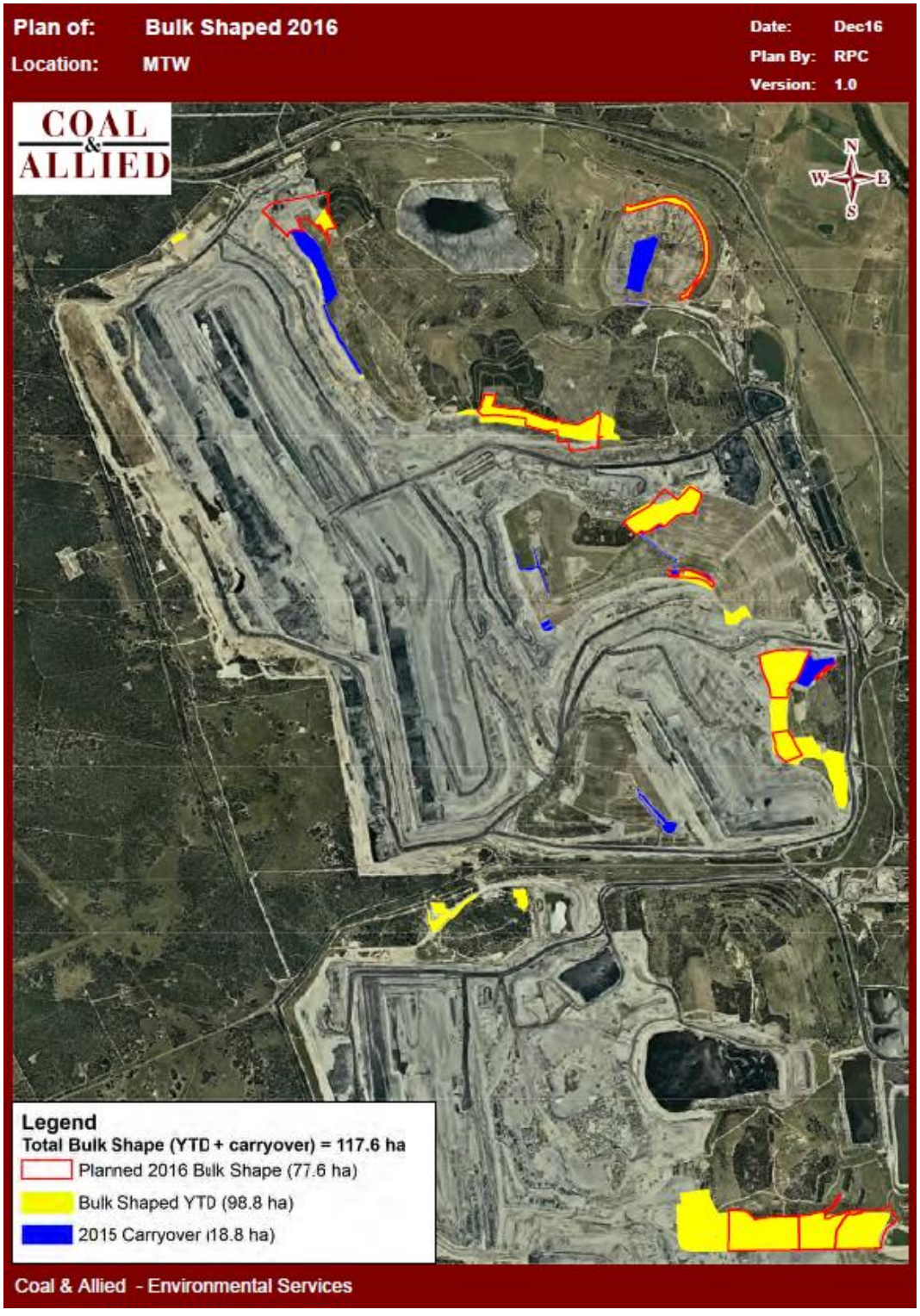
December 2016

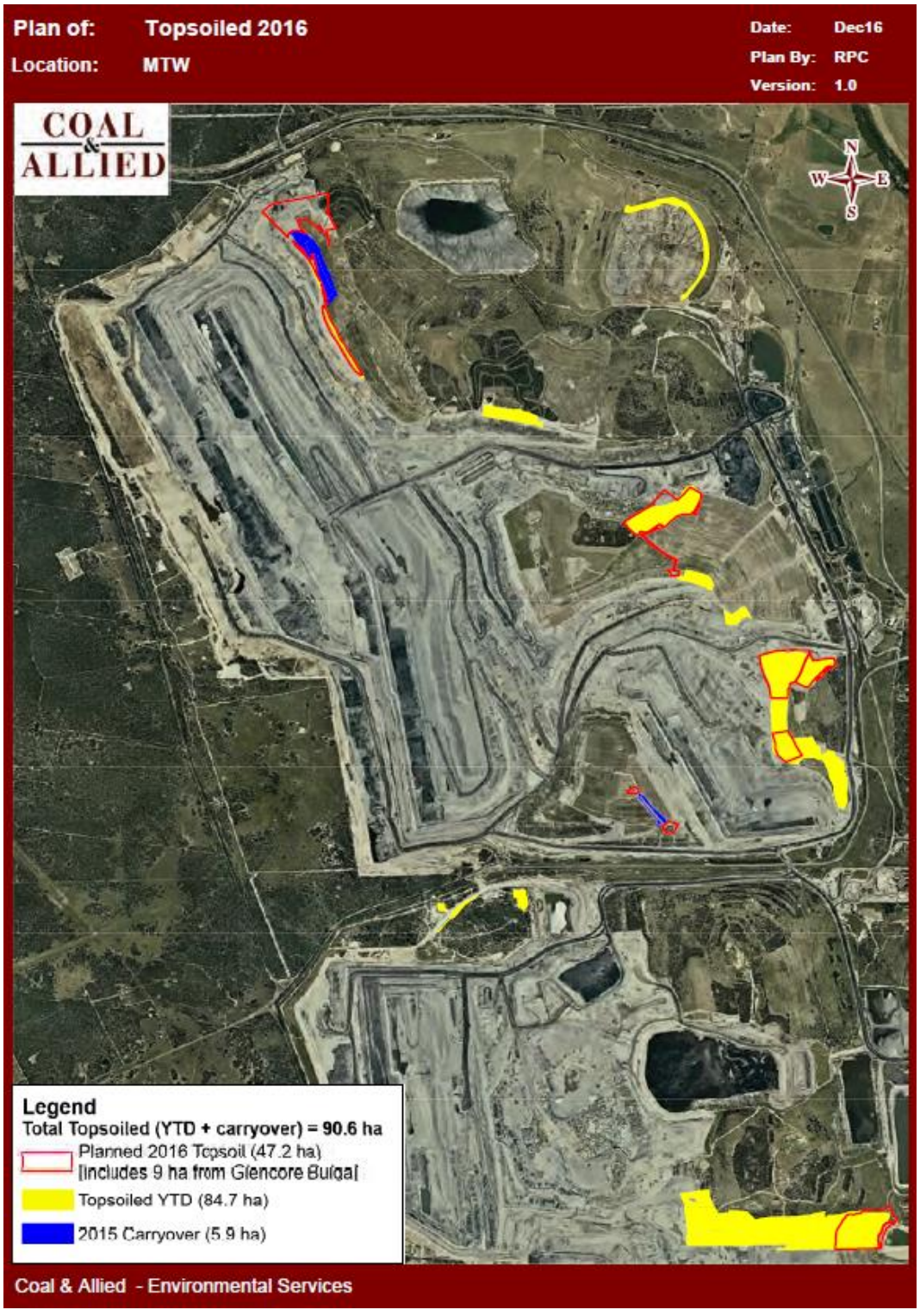
Attached as **Appendix C**

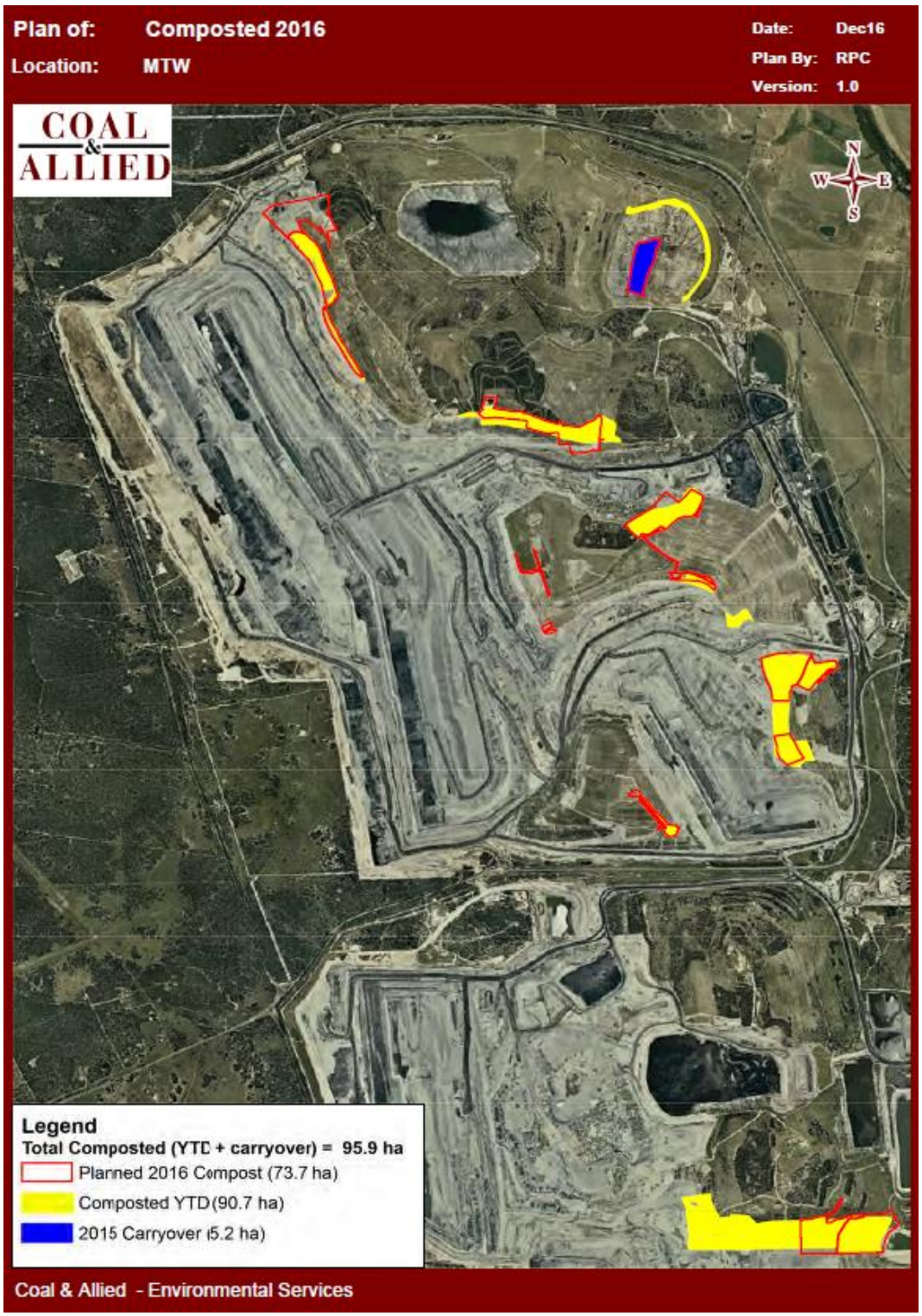
4.0 Rehabilitation plan

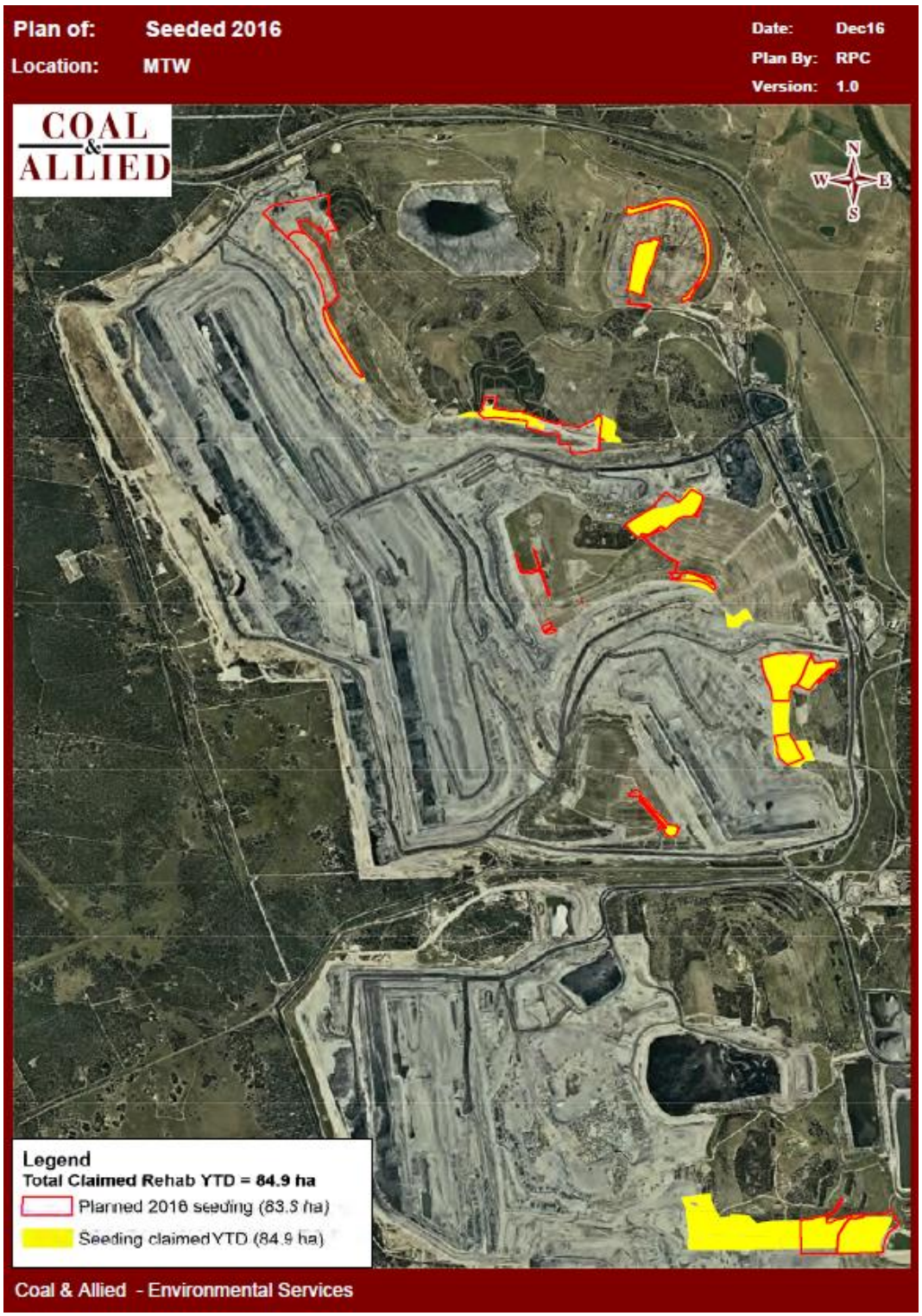
At the end of the December rehabilitation 117.6 ha of the targeted areas bulk shaped, 90.6 ha of topsoiled, 95.9 ha composted and 84.9 ha seeded were completed.

Disturbance was predominantly in Warkworth's West Pit area, for mine advance, and to construct a water management contour along the western extent of the disturbance to manage water off pre-strip activities. A total of 120.2 ha have been disturbed at the end of December.




Plan of: Topsoiled 2016
Location: MTW
Date: Dec16
Plan By: RPC
Version: 1.0
COAL & ALLIED
N
W
E
S
Legend
Total Topsoiled (YTD + carryover) = 90.6 ha
Planned 2016 Topsoil (47.2 ha)
[includes 9 ha from Glencore Bulga]
Topsoiled YTD (84.7 ha)
2015 Carryover (5.9 ha)
Coal & Allied - Environmental Services


Plan of: Composted 2016
Location: MTW
Date: Dec16
Plan By: RPC
Version: 1.0
COAL & ALLIED
N
W
E
S
Legend
Total Composted (YTD + carryover) = 95.9 ha
Planned 2016 Compost (73.7 ha)
Composted YTD (90.7 ha)
2015 Carryover (5.2 ha)
Coal & Allied - Environmental Services


Plan of: Seeded 2016
Location: MTW
Date: Dec16
Plan By: RPC
Version: 1.0
COAL & ALLIED
N
W
E
S
Legend
Total Claimed Rehab YTD = 84.9 ha
Planned 2016 seeding (83.3 ha)
Seeding claimed YTD (84.9 ha)
Coal & Allied - Environmental Services


Plan of: Disturbance 2016
Location: MTW
Date: Dec16
Plan By: RPC
Version: 1.0
COAL & ALLIED
N
W
E
S
Legend
Total Planned Disturbance 2016 = 149 ha
Planned 2016 New Disturbance (140.4 ha)
Planned 2016 Rehab Disturbance (8.6 ha)
Disturbance YTD (120.2 ha)
Coal & Allied - Environmental Services

5.0 Sound Attenuation Update

Extensive work has been undertaken since 2013 to sound attenuate 100% of MTW's Heavy Mobile Equipment (HME) fleet. MTW's current HME fleet consists of the following:

- 76 Haul Trucks
- 7 Water Carts
- 26 Dozers
- 6 Excavators
- 6 Drills.

6.0 Acquisition Update

A presentation with a property acquisition update for Mount Thorley Warkworth is included in **Appendix D** of this Business Paper. No updates have been made to the property portfolio since the last CCC meeting.

7.0 Website Uploads

The following is a list of all documents uploaded to the MTW library of the Rio Tinto website between the period of 1 October 2016 to 31 December 2016. Uploads have been characterised as Additions, being a new document, or a Change, meaning a new version of an existing document. Please refer to the library page of the website for document contents: http://www.riotinto.com/copperandcoal/documents-10401.aspx

Table 1: Uploaded Documents

Document Title	Upload type
Mount Thorley Warkworth Noise Management Plan	Change
Mount Thorley Warkworth Environmental Protection Licence 1376 1976 Monthly Meaningful Summary September 2016	Addition
Mount Thorley Warkworth Environmental Protection Licence 1376 1976 Monthly Obtained Data Summary September 2016	Addition
Mount Thorley Warkworth Environmental Monitoring Report September 2016	Addition
Mount Thorley Warkworth Complaints Register 2016	Change

8.0 Community investment & support

Mount Thorley Warkworth (MTW) site donations

The site donations committee provides an opportunity for employees to assess and make recommendations on requests for sponsorship and donations received by MTW.

Funding is provided in the form of sponsorship or a donation to assist local, community-based organisations. The funding criteria for site donations has been updated to reflect MTW's focus on funding projects and initiatives from the Bulga, Milbrodale, Broke and Singleton area.

Application forms can be requested by emailing CNACommunityRelation@riotinto.com. Alternatively, potential projects and opportunities for support from Coal & Allied can be discussed with Travis Bates – Community Relations Specialist, Singleton.

In 2016, MTW provided $50,000 to 30 local projects and initiatives, including:

- Singleton Mayoral Scholarships
- Singleton Art Prize
- Invisible Wounds Mental Health workshop – Australian Families of the Military
- 2016 Production of The Wizard of Oz
- Group 21 2015-2017 Sponsorship
- Singleton Relay for Life – Cancer Council
- Beyond Blue community fundraiser
- 2016 Prime Stock competition
- Holes 4 Hospital Charity Golf Day
- Singleton Show
- Salvation Army Children's Christmas Party
- Singleton Hospital – Bed for palliative care room
- Hunter Valley Offroad Racing Association – Come and Try day (CANTEEN fundraiser)
- Cancer Council – Transport for Treatment program

Coal & Allied Community Development Fund (CDF)

The year 2016 marked 18 years of operation of the CDF, which has invested over $14.5 million to support over 120 community projects in the Hunter Valley since its establishment in 1999, across the areas of health, education, environment and economic development.

In 2014, Coal & Allied announced that a further $3 million would be made available to the CDF over a three year period (2015 – 2017) for projects in the Singleton, Muswellbrook and Upper Hunter LGAs. Strategic priority areas were refined for the 2015-2017 funding cycle to enable a more targeted approach to addressing identified community need and to leverage other resources Coal and Allied may be able to offer to strengthen community partnerships.

Priority areas for the 2015-2017 funding cycle include:

- Economic Development: encouraging the diversity and competitiveness of the Upper Hunter economy
- Community Health: Supporting projects which target health, safety and social wellbeing of the community
- Education: Promoting the value of education and building skills within our community
- Environment and Land Management: Supporting projects that can make a difference on a greater scale. i.e. beyond C&A mining operations

In 2016, the CDF contributed almost $700,000 to 14 programmes aimed at delivering long term benefits for communities in the CDF catchment, which include the Singleton, Muswellbrook and Upper Hunter LGAs. A further $500,000 is available for allocation in 2017.

Table 2: Coal & Allied Community Development Fund projects supported in 2016

Programme	Partner
Enterprise Facilitation	Sirolli Institute
Supporting Children's Developing Social Competence	Early Links Inclusion Support Service
Science and Enginnering Challenge, and SMART Program (2015-2017)	University of Newcastle
Upper Hunter Education Fund Scholarships (2015-2017)	Upper Hunter Education Fund
Business Development Officer	Singleton Business Chamber
Singleton High School Agricultural Course	Singleton High School
University of Newcastle Scholarships	University of Newcastle
Youth Leadership Program	Outward Bound Australia
Singleton Economic Development and Funding Coordinator	Singleton Council
Singleton Community College Strategic Plan	Singleton Community College
HSC Study Camps	Upper Hunter Education Fund

Ready 4 School Program	Jerrys Plains Public School
Tocal Steers Challenge	Tocal College
Early Learning Program	Milbrodale Public School

9.0 Tailings Dam 1 Planting

The following is a list of vegetation species planted on Tailings Dam 1:

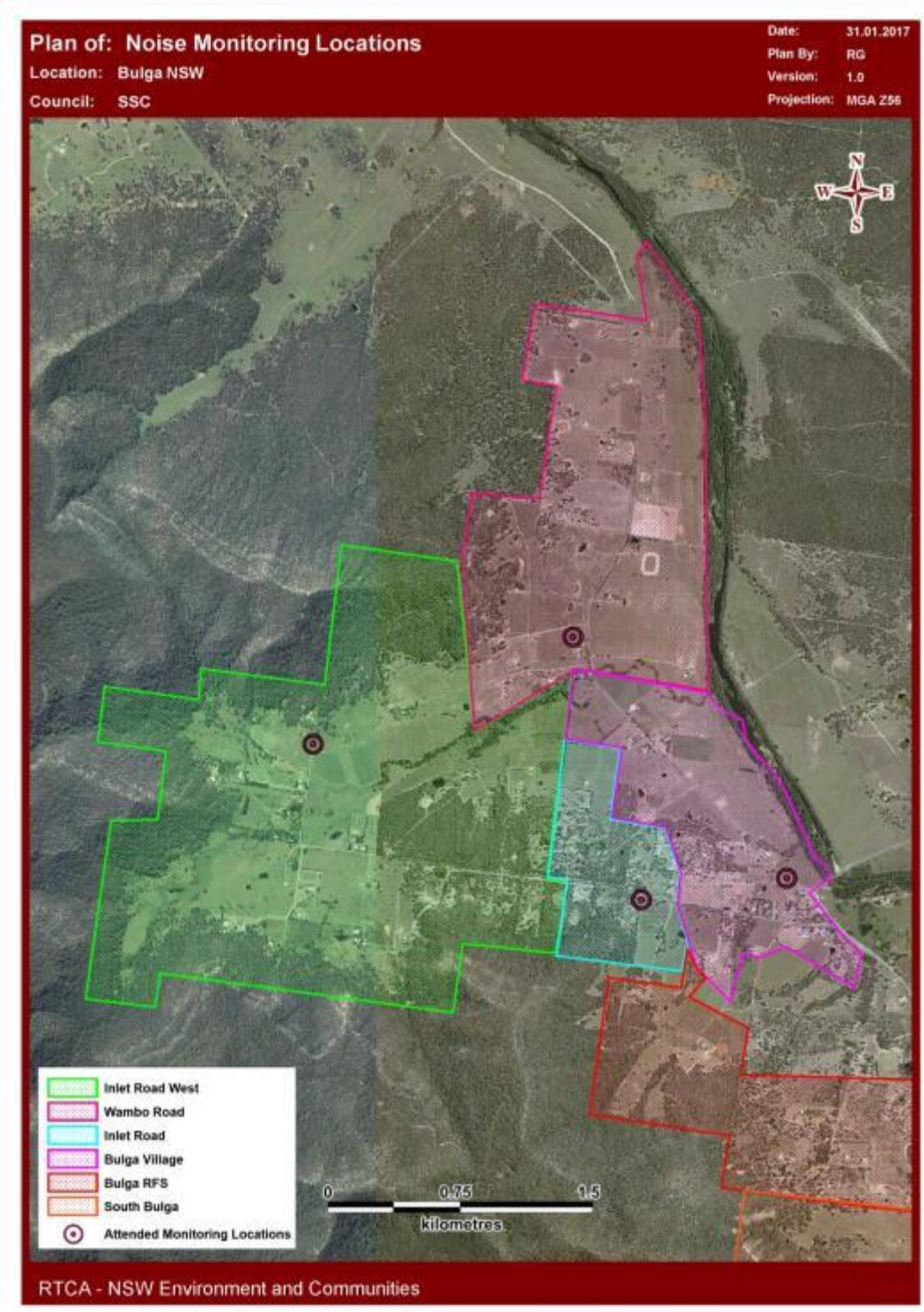
Area	Substrate	Area (ha)	Vegetation Sown
2015 native sowing	spoil / compost	30	MTW Woodland Mix (2013 order) – detailed below.
2015 cover crop	topsoil / compost	10	Spring Summer Rehab Blend (2015) comprising millet, chicory, clover, lucerne and burgundy bean.
2016 native sowing	spoil / compost	5.5	MTW Woodland Mix (2014 order – generally as for 2013 with seasonal variations in accordance with MOP species and genera options).

MTW Woodland Mix (2013 order in accordance with MOP Table 35 – S)			
Category	**MOP min. no. species**	**MOP min. no. genera**	**Species included in 2013 mix**
Trees			
Dominant tall trees	3	3	*Eucalyptus crebra, Eucalyptus fibrosa, Eucalyptus moluccana, Corymbia maculata*
Sub-dominant tall trees	2	1	*Angophora floribunda, Eucalyptus punctata, Eucalyptus tereticornis*
Small trees nitrogen fixing	2	1	*Acacia implexa, Acacia parvipinnula, Acacia salicina*
Small trees non-nitrogen fixing	2	1	*Brachychiton populneus, Bursaria spinosa, Callitris endlicheri, Notelaea microcarpa*
Shrubs/woody climbers			
Primary colonising and/or short lived Acacias	2	1	*Acacia cultriformis, Acacia falcata, Acacia leiocalyx*
Long lived and/or understory Acacias	2	2	*Acacia amblygona, Acacia decora, Acacia paradoxa*
Nitrogen fixing shrubs-non-Acacias (*Fabaceae* family)	3	2	*Daviesia genistifolia, Daviesia ulicifolia, Hardenbergia violacea, Indigofera australis, Podolobium ilicifolium, Pultenaea spinosa*
Non-nitrogen fixing shrubs	4	0	*Cassinia arcuata, Cassinia quinquefaria, Clematis glycinoides, Dodonaea viscosa subsp. cuneata, Hakea sericea, Kunzea ambigua, Melaleuca decora, Melaleuca nodosa, Myoporum montanum, Olearia elliptica, Ozothamnus diosmifolius, Senna artemesioides subsp. Zygophylla*
Subshrubs			

MTW Woodland Mix (2013 order in accordance with MOP Table 35 – S)			
Category	**MOP min. no. species**	**MOP min. no. genera**	**Species included in 2013 mix**
	3	0	*Atriplex semibaccata, Einadia nutans, Einadia trigonos, Enchylaena tomentosa*
Forbs			
	6	1	*Calocephalus, critreus, Calotis lappulacea, Chrysocephalum apiculatum, Glycine latifolia, Glycine tabacina, Mentha satureoides, Podolepis neglecta, Swainsona galegifolia, Vittadinia cuneata, Vittadinia sulcata, Wahlenbergia communis*
Grasses			
Grasses primary colonising	4	4	*Austrostipa densiflora, Austrostipa scabra, Bothriochloa decipiens, Bothriochloa macra, Chloris truncata, Panicum effusum*
Grasses long term understorey	5	4	*Austrostipa bigeniculata, Capillipedium spicigerum, Dicanthium sericeum, Paspalidium distans, Sporobolus creber, Themeda avenacea, Themeda triandra*
Grasses long term understorey shade tolerant	4	1	*Austrostipa verticillata, Cymbopogon refractus, Imperata cylindrica, Joycea pallida, Microleana stipoides, Poa labillardieri*
Monocots other than grasses			
	4	2	*Carex fascicularis, Carex inversa, Fimbristylis dichotoma, Gahnia aspera, Lomandra filiformis, Lomandra longifolia, Lomandra multiflorus*

10.0 Representation of Private Residences – MTW Noise Monitoring Programme

Below is the representation of private residences and the applicable noise criteria as set out in Schedule 3 of the approvals. :



COAL & ALLIED

Managed by Rio Tinto Coal Australia

Appendix A

Environmental Monitoring
October 2016

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Mount Thorley Warkworth

Monthly Environmental Report

October 2016

Coal & Allied Operations Pty Ltd

ABN 16 000 023 656

Lemington Road, Ravensworth via Singleton NSW 2330 Australia

PO Box 315 Singleton NSW 2330 Australia

Telephone +61 2 6570 0300 Facsimile +61 2 6570 0399

CONTENTS

Figures

Tables

Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environmental Advisor**	**Draft**	**22/11/2016**
1.1	**Environmental Specialist**	**Final**	**01/12/2016**

1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Mount Thorley Warkworth (MTW). This report includes all monitoring data collected for the period 1st October to 31st October 2016.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

Meteorological data is collected at MTW's 'Charlton Ridge' meteorological station (refer to Figure 3: Air Quality Monitoring Locations).

2.1.1 Rainfall

Rainfall for the period is summarised in Table 1, the year-to-date trend and historical trend are shown in **Error! Reference source not found.**.

Table 1: Monthly Rainfall MTW

2016	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
October	40.2	534.8

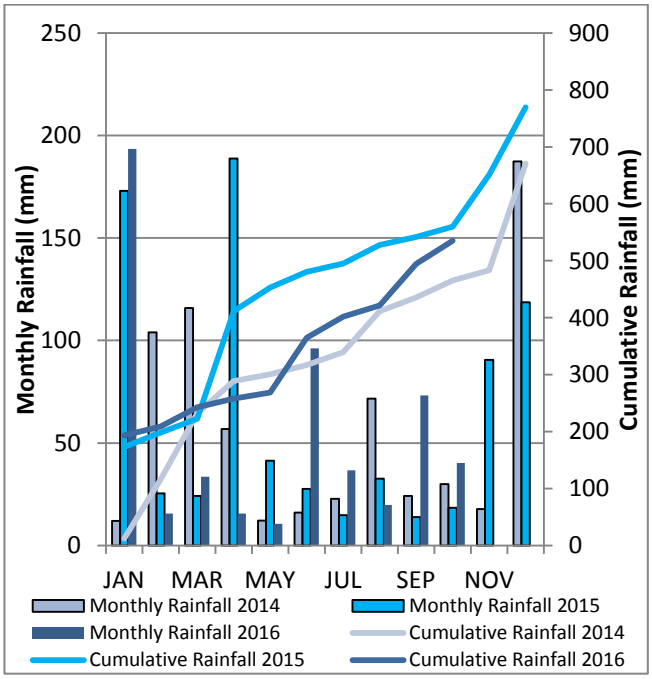


Figure 1: Rainfall Trend YTD

2.1.2 Wind Speed and Direction

Winds from the Northwest were dominant throughout the reporting period as shown in **Error! Reference source not found.**.

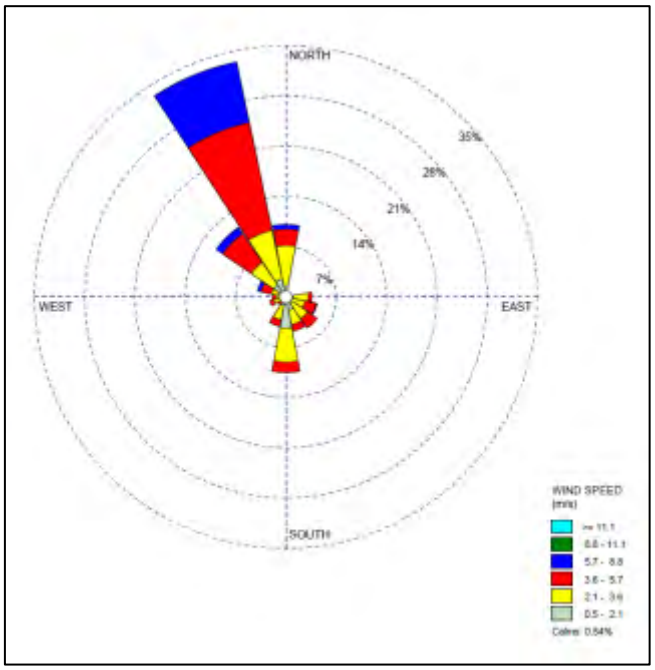


Figure 2: Charlton Ridge Wind Rose – October 2016

Figure 3: Air Quality Monitoring Locations

2.2 Depositional Dust

To monitor regional air quality, MTW operates and maintains a network of nine depositional dust gauges, situated on private and mine owned land surrounding MTW.

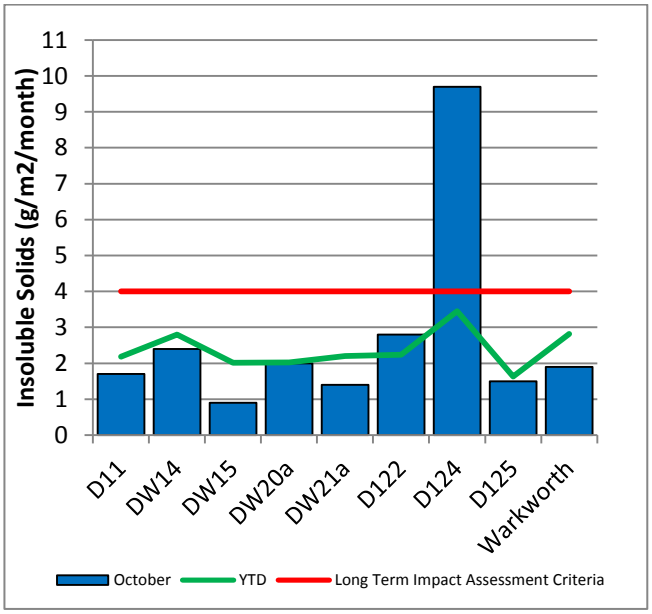


Figure 4 displays insoluble solids results from depositional dust gauges during the reporting period compared against the year-to-date average and the annual impact assessment criteria.

During the reporting period the D124 monitor recorded a monthly result above the long term impact assessment criteria of 4.0 g/m² per month. Field notes associated with D124 confirm the presence of insects and bird droppings. As such the result is considered contaminated and will be excluded from calculation of the annual average.

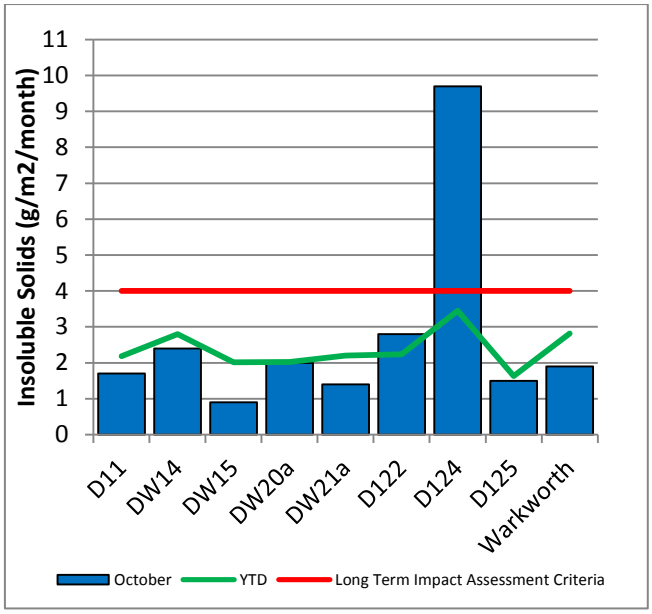


Figure 4: Depositional Dust – October 2016

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM_{10}). The location of these monitors can be found in Figure 3. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

2.3.1 HVAS PM_{10} Results

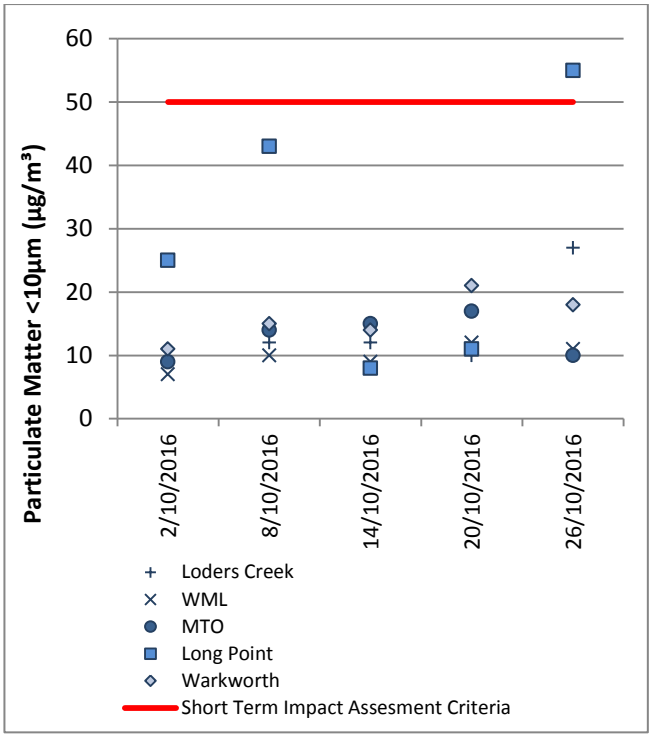


Figure 5 shows the individual PM_{10} results at each monitoring station against the short term impact assessment criteria of 50µg/m³.

On 26/10/2016 one HVAS PM_{10} unit recorded a result greater than the short term (24hr) PM_{10} impact assessment criteria; Long Point (55 µg/m³). At the time of preparation of this report, the result is under investigation. Preliminary advice has been provided to the Department of Planning & Environment.

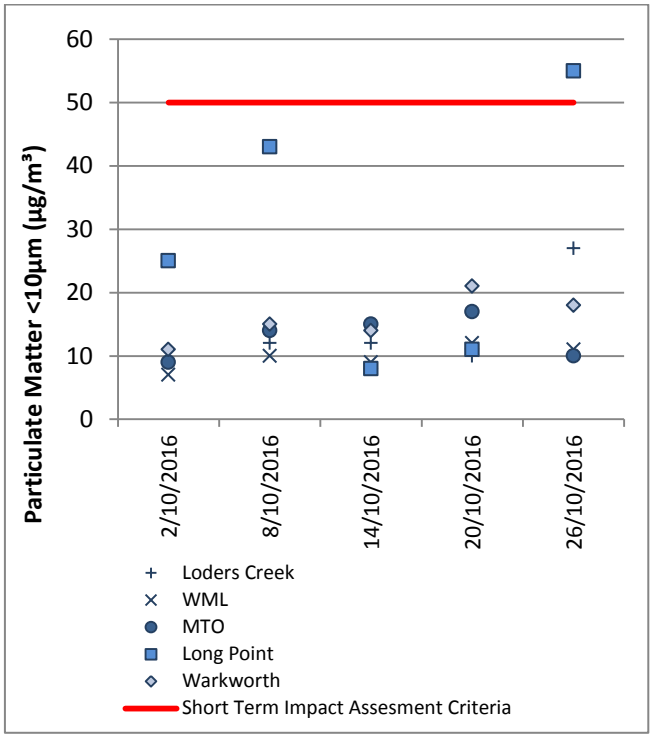


Figure 5: Individual PM_{10} Results – October 2016

Figure 6 shows the annual average PM_{10} results against the long term impact assessment criteria.

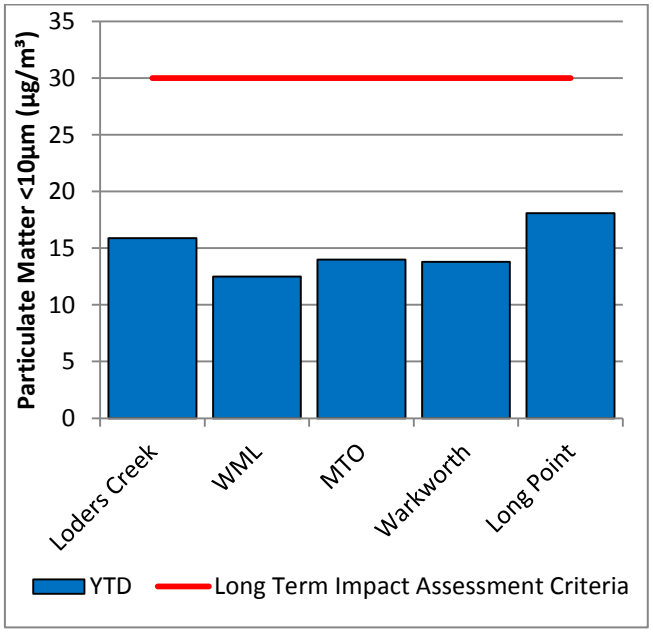


Figure 6: Annual Average PM_{10} – October 2016

2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long term impact assessment criteria of 90µg/m³.

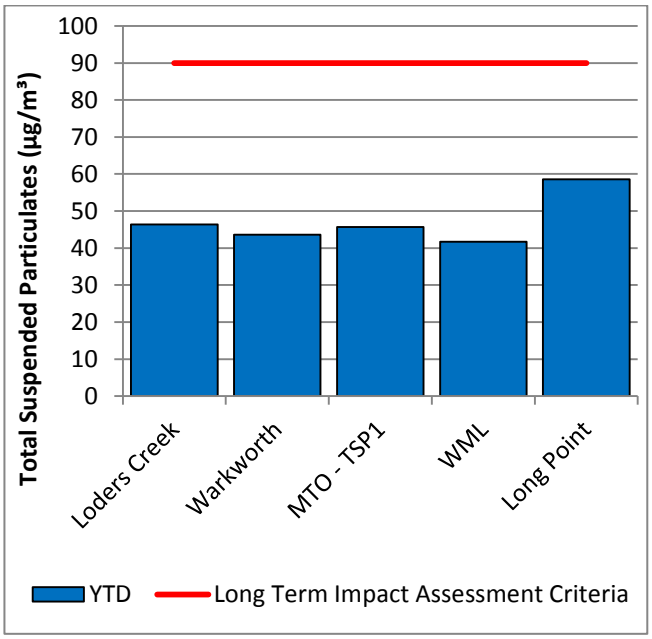


Figure 7: Annual Average Total Suspended Particulates – October 2016

2.3.3 Real Time PM_{10} Results

Mount Thorley Warkworth maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits.

Results for real time dust sampling are shown in Figure 8, including the daily 24 hour average PM_{10} result and the annual PM_{10} average.

2.3.4 Real Time Alarms for Air Quality

During October, the real time monitoring system generated 45 automated air quality related alerts, including 37 alerts for adverse meteorological conditions and 8 alerts for elevated PM_{10} levels.

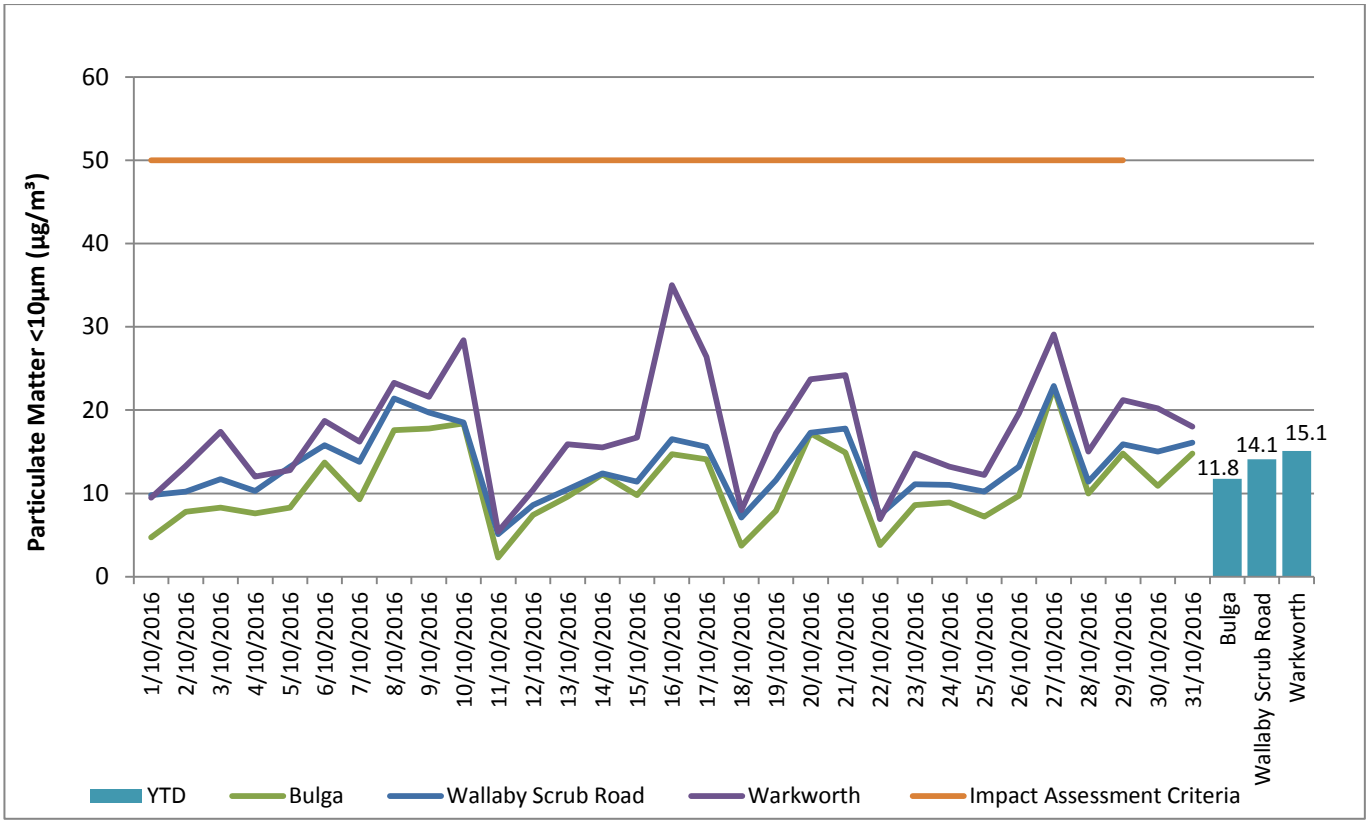


Figure 8: Real Time PM_{10} daily 24hr average and annual average – October 2016

3.0 WATER QUALITY

MTW maintains a network of surface water and groundwater monitoring sites.

3.1 Surface Water

Monitoring is conducted at mine site dams and surrounding natural watercourses.

Surface water courses are sampled on a monthly or quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). The Hunter River and the Wollombi Brook are sampled both upstream and downstream of mining operations, to monitor the potential impact of mining on the river. Other Hunter River tributaries are also monitored.

Results of monitoring are reported quarterly, next available in the December 2016 report.

3.2 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the MTW Groundwater Monitoring Programme.

Groundwater results are reported quarterly, next available in the December 2016 report.

3.3 HRSTS Discharge

MTW participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points Dam 1N and Dam 9S. Discharges can only take place subject to HRSTS regulations.

During the reporting period no water was discharged under the HRSTS.

4.0 BLAST MONITORING

MTW have a network of six blast monitoring units. These are located at nearby privately owned residences and function as regulatory compliance monitors.

The location of these monitors can be found in **Error! Reference source not found.**.

4.1 Blast Monitoring Results

During October 2016, 31 blasts were initiated at MTW. to **Error! Reference source not found.** show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 2.

Table 2: Blasting Limits

Airblast Overpressure (dB(L))	Comments
115	5% of the total number of blasts in a 12 month period
120	0%
Ground Vibration (mm/s)	**Comments**
5	5% of the total number of blasts in a 12 month period
10	0%

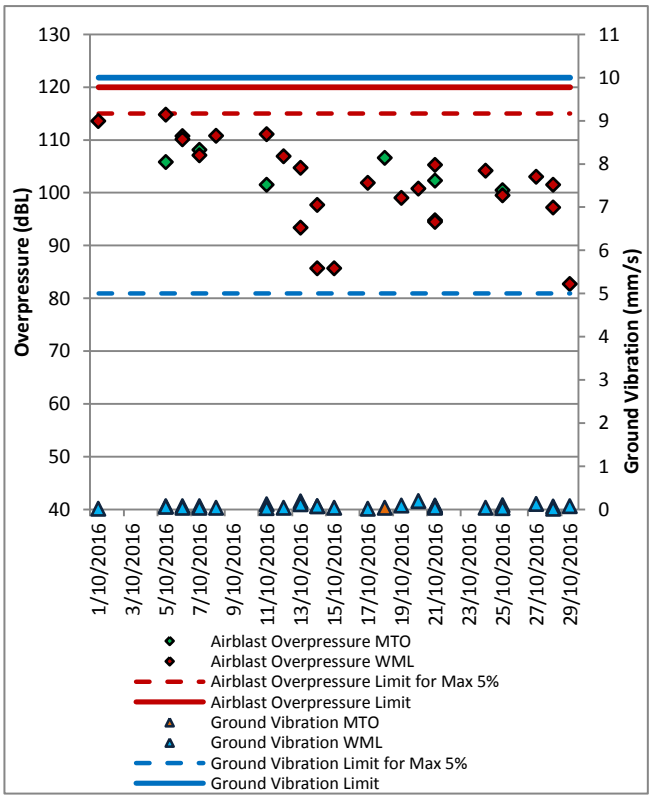


Figure 9: Abbey Green Blast Monitoring Results – October 2016

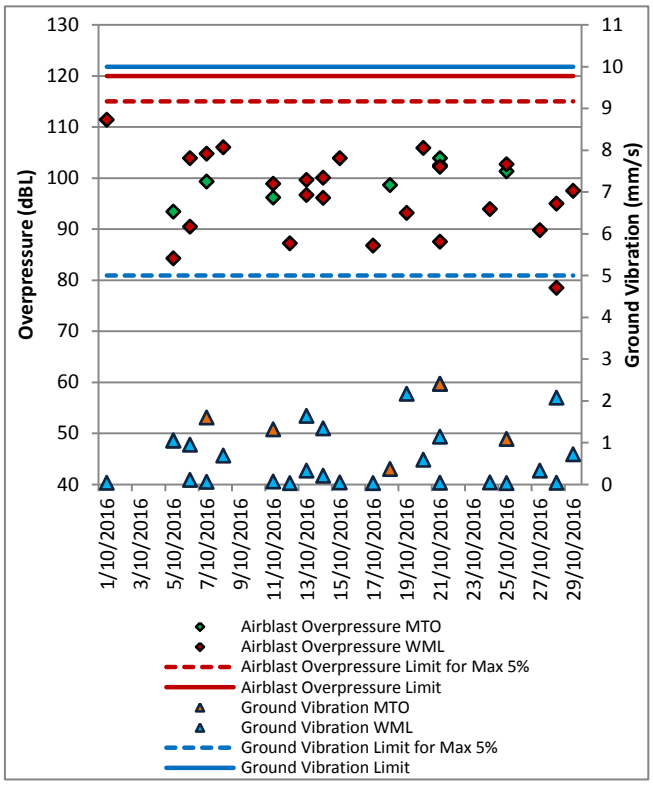


Figure 10: Bulga Village Blast Monitoring Results – October 2016

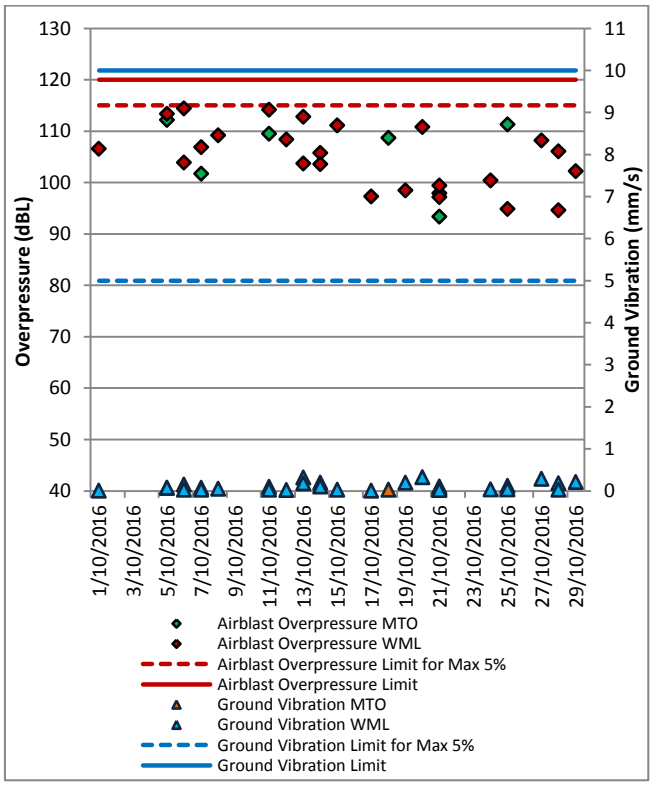


Figure 11: MTIE Blast Monitoring Results – October 2016

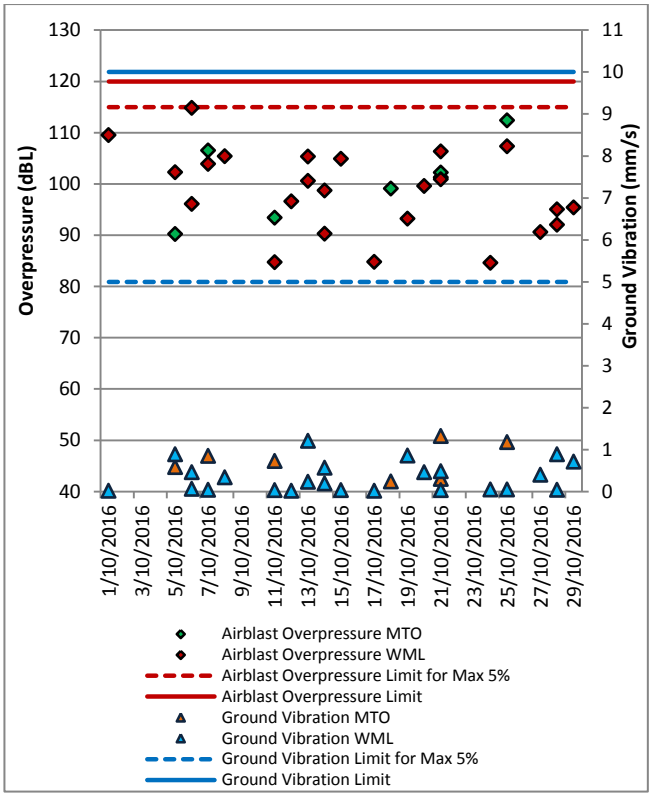


Figure 12: Wollemi Peak Road Blast Monitoring Results – October 2016

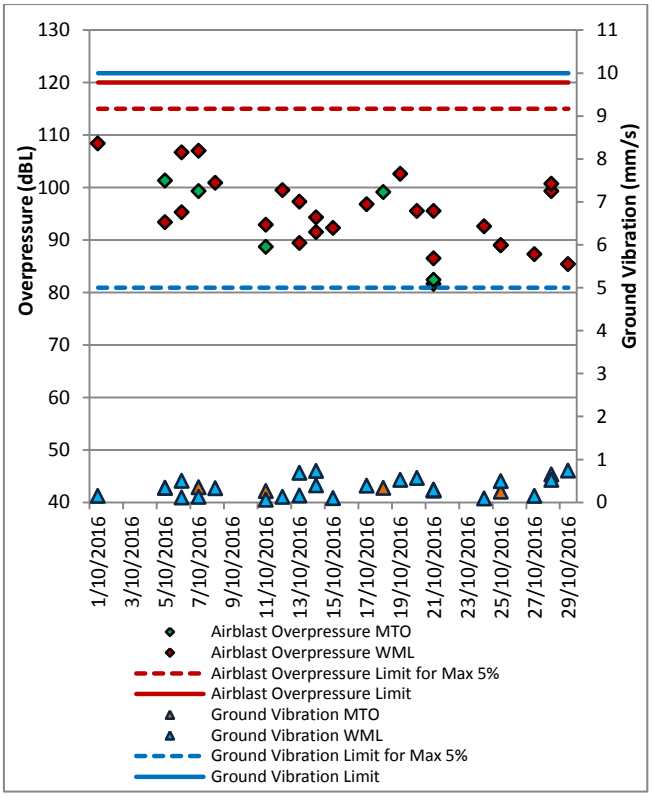


Figure 14: Warkworth Blast Monitoring Results – October 2016

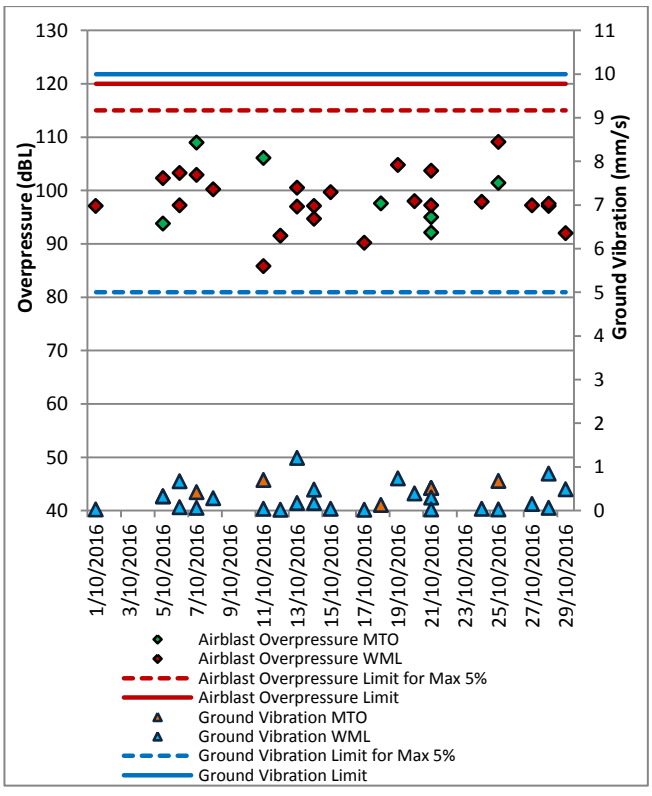


Figure 13: Wambo Road Blast Monitoring Results – October 2016

Figure 15: MTW Blast Monitoring Location Plan

5.0 NOISE

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan. A review against EIS predictions will be reported in the Annual Review. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Real time noise monitoring also occurs at nine sites surrounding MTW. Noise monitoring locations are displayed in Figure 16.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 24th October 2016. All measurements complied with the relevant criteria. Results are detailed in Table 3 to **Error! Reference source not found.**.

5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in Tables 3 and 4.

Table 3: $L_{Aeq,\ 15\ minute}$ Warkworth Impact Assessment Criteria – October 2016

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion (dB(A))	Criterion Applies?[1,6]	WML L_{Aeq} dB[2,4]	Exceedance[3]	Total $L_{Ceq} - L_{Aeq}$	Revised WML L_{Aeq}[5,6]
Bulga RFS	24/10/2016 21:02	1.5	F	35	Yes	IA	Nil	19	IA
Bulga Village	24/10/2016 23:36	1.4	E	38	Yes	28	Nil	20	28
Gouldsville	24/10/2016 21:55	1.3	F	37	Yes	IA	Nil	24	IA
Inlet Rd	24/10/2016 22:50	2.1	E	35	Yes	IA	Nil	21	IA
Inlet Rd West	24/10/2016 23:12	1.4	E	35	Yes	25	Nil	23	30
Long Point	24/10/2016 21:08	1.9	F	36	Yes	IA	Nil	25	IA
South Bulga	24/10/2016 21:26	1.4	F	35	Yes	IA	Nil	20	IA

Table 4: $L_{Aeq,\ 15\ minute}$ Warkworth - Land Acquisition Criteria – October 2016

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion (dB(A))	Criterion Applies?[1,6]	WML L_{Aeq} dB[2,4]	Exceedance[3]	Total $L_{Ceq} - L_{Aeq}$[7]	Revised WML L_{Aeq}[5,6]
Bulga RFS	24/10/2016 21:02	1.5	F	40	Yes	IA	Nil	19	IA
Bulga Village	24/10/2016 23:36	1.4	E	43	Yes	28	Nil	20	28
Gouldsville	24/10/2016 21:55	1.3	F	43	Yes	IA	Nil	24	IA
Inlet Rd	24/10/2016 22:50	2.1	E	40	Yes	IA	Nil	21	IA
Inlet Rd West	24/10/2016 23:12	1.4	E	40	Yes	25	Nil	23	30
Long Point	24/10/2016 21:08	1.9	F	40	Yes	IA	Nil	25	IA
South Bulga	24/10/2016 21:26	1.4	F	40	Yes	IA	Nil	20	IA

Notes
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LA1,1minute attributed to Warkworth mine (WML);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

5.1.3 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in Table 5 and 6.

Table 5: $L_{Aeq, 15minute}$ Mount Thorley - Impact Assessment Criteria – October 2016

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion dB	Criterion Applies?[1,6]	MTO L_{Aeq} dB[2,4]	Exceedance[3]	Total L_{Ceq} – L_{Aeq}[7]	Revised MTO L_{Aeq}[5,6]
Bulga RFS	24/10/2016 21:02	1.5	F	37	Yes	<30	Nil	19	<35
Bulga Village	24/10/2016 23:36	1.4	E	38	Yes	30	Nil	20	35
Gouldsville	24/10/2016 21:55	1.3	F	35	Yes	IA	Nil	24	IA
Inlet Rd	24/10/2016 22:50	2.1	E	37	Yes	29	Nil	21	34
Inlet Rd West	24/10/2016 23:12	1.4	E	35	Yes	<25	Nil	23	<25
Long Point	24/10/2016 21:08	1.9	F	35	Yes	IA	Nil	25	IA
South Bulga	24/10/2016 21:26	1.4	F	36	Yes	<25	Nil	20	<30

Table 6: $L_{A1, 1Minute}$ Mount Thorley - Impact Assessment Criteria – October 2016

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	MTO $L_{A1, 1min}$ dB[2,4]	Exceedance[3]
Bulga RFS	24/10/2016 21:02	1.5	F	47	Yes	<30	Nil
Bulga Village	24/10/2016 23:36	1.4	E	48	Yes	35	Nil
Gouldsville	24/10/2016 21:55	1.3	F	45	Yes	IA	Nil
Inlet Rd	24/10/2016 22:50	2.1	E	47	Yes	38	Nil
Inlet Rd West	24/10/2016 23:12	1.4	E	45	Yes	28	Nil
Long Point	24/10/2016 21:08	1.9	F	45	Yes	IA	Nil
South Bulga	24/10/2016 21:26	1.4	F	46	Yes	<30	Nil

Notes
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LA1,1minute attributed to Mt Thorley Operations (MTO);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

5.1.4 INP Low Frequency

In accordance with the requirements of the NSW Industrial Noise Policy (INP), the low frequency modification factor has been applied where appropriate. It should be noted that the Industrial Noise Policy does not give guidance on the application of the penalty where more than one target noise source is audible. The L_{Ceq} levels reported above are "Total", or "Total mine noise" at best, and cannot be attributed accurately to a single mine. Accordingly, where the INP criteria for the application of the Low Frequency modification factor is triggered, the penalty has been applied to the dominant mine noise source (either of WML or MTO). There were no exceedances of noise criteria following application of the INP Low Frequency modification factor during October 2016.

Figure 16: Noise Monitoring Location Plan

5.2 Noise Management Measures

A program of targeted supplementary attended noise monitoring is in place at MTW, supported by the real-time directional monitoring network and ensuring the highest level of noise management is maintained. The supplementary program is undertaken by MTW personnel and involves:

- Routine inspections from both inside and outside the mine boundary;
- Routine and as-required handheld noise assessments (undertaken in response to noise alarm and/or community complaint), comparing measured levels against consent noise limits; and
- Validation monitoring following operational modifications to assess the adequacy of the modifications.

Where a noise assessment identifies noise emissions which are exceeding the relevant noise limit(s) for any particular residence, modifications will be made so as to ensure that the noise event is resolved within 75 minutes of identification. The actions taken are commensurate with the nature and severity of the noise event, but can include:

- Replacement of non-attenuated equipment with sound attenuated equipment;
- Changing the haul route to a less noise sensitive haul;
- Changing dump locations (in-pit or less exposed dump option);
- Reducing equipment numbers;
- Shut down of task; or
- Site shut down.

A summary of these assessments undertaken during October are provided in

.

Table 7: Supplementary Attended Noise Monitoring Data – October 2016

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
444	3	2	0.68

Note: Measurements are taken under all meteorological conditions, including conditions under which the consent noise criteria do not apply.

6.0 OPERATIONAL DOWNTIME

During October, a total of 1076 hours of equipment downtime was logged in response to environmental events such as dust, noise and adverse meteorological conditions. Operational downtime by equipment type is shown in Figure 17.

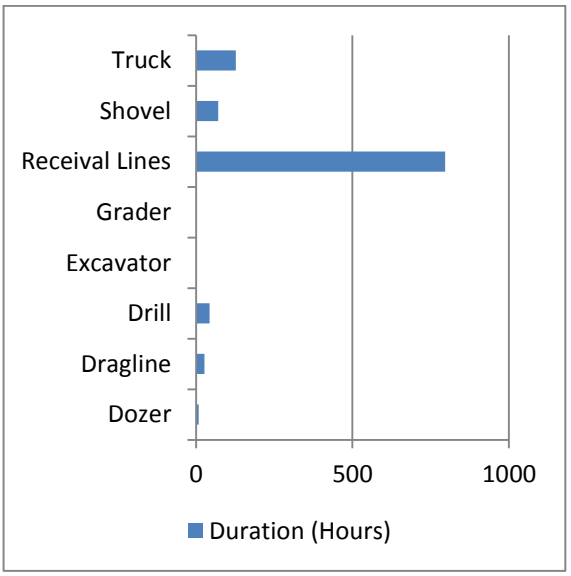


Figure 17: Operational Downtime by Equipment Type – October 2016

7.0 REHABILITATION

During October, 12.1 Ha of land was released, 17.3 Ha of land was bulk shaped, 15.4 Ha of land was topsoiled, 16.4 Ha of land was composted and 15.4 Ha of land was rehabilitated. Year-to-date progress can be viewed in **Error! Reference source not found.**.

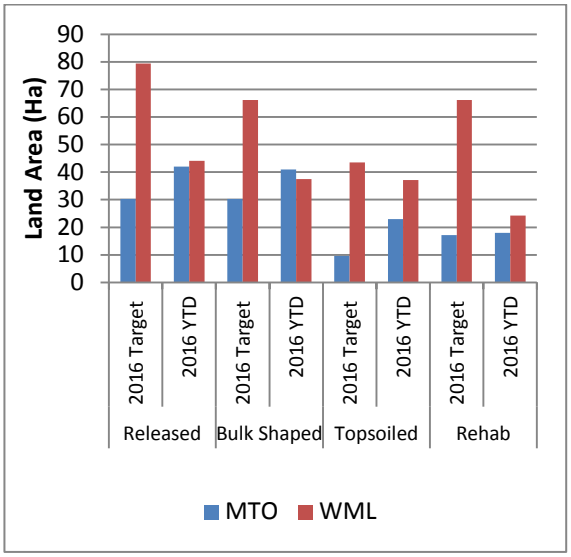


Figure 18: Rehabilitation YTD – October 2016

8.0 ENVIRONMENTAL INCIDENTS

There were no reportable environmental incidents during the reporting period.

9.0 COMPLAINTS

During the reporting period 36 complaints were received, details of these complaints are shown in **Error! Reference source not found.** below.

	Noise	Dust	Blast	Lighting	Other	Total
January	29	1	5	2	2	39
February	24	2	6	1	0	33
March	44	1	2	1	0	48
April	67	7	4	0	5	83
May	17	5	7	2	0	31
June	18	1	4	5	2	30
July	15	1	5	0	11	32
August	48	3	10	1	2	64
September	24	2	6	0	3	35
October	22	6	6	1	1	36
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	308	29	55	13	26	431

Figure 19: Complaints Summary - YTD October 2016

Appendix A: Meteorological Data

Table 8: Meteorological Data – Charlton Ridge Meteorological Station – October 2016

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/10/2016	21.0	9.9	63.9	35.2	300.5	5.2	0.0
2/10/2016	-	-	-	-	-	-	-
3/10/2016	25.7	8.1	81.4	28.0	282.3	4.2	0.0
4/10/2016	22.3	8.5	62.9	28.8	296.0	6.6	0.0
5/10/2016	22.4	9.1	53.8	18.7	287.1	4.4	0.0
6/10/2016	27.0	9.9	57.8	20.6	301.1	5.5	0.0
7/10/2016	28.9	10.2	76.3	18.0	280.0	3.4	0.0
8/10/2016	27.6	12.9	79.6	29.7	237.9	4.0	0.0
9/10/2016	24.2	12.3	78.9	33.4	129.7	2.2	0.0
10/10/2016	32.0	11.2	93.0	29.9	245.2	3.9	10.2
11/10/2016	20.9	8.9	85.2	18.9	239.3	3.2	1.8
12/10/2016	22.1	3.8	78.5	30.0	236.3	2.9	0.0
13/10/2016	19.6	10.0	74.8	39.6	160.6	3.6	0.0
14/10/2016	22.5	7.0	83.5	30.2	147.0	2.2	0.0
15/10/2016	25.8	5.3	92.7	18.3	216.1	2.3	0.0
16/10/2016	28.5	7.4	75.9	24.3	280.4	3.9	0.0
17/10/2016	21.7	10.2	94.4	33.2	273.8	4.4	7.6
18/10/2016	23.7	6.5	91.0	26.9	291.5	4.1	0.0
19/10/2016	15.4	13.7	68.0	52.9	140.2	2.6	0.0
20/10/2016	24.4	12.2	74.8	38.1	126.3	2.8	0.0
21/10/2016	28.5	8.5	93.3	37.4	223.8	2.6	0.0
22/10/2016	19.6	9.8	96.5	35.5	251.9	4.0	16.0
23/10/2016	21.1	5.5	78.2	24.1	199.9	2.5	0.0
24/10/2016	23.5	5.3	89.8	26.8	194.2	2.4	0.0
25/10/2016	26.6	6.2	89.9	20.2	248.8	3.2	0.0
26/10/2016	29.2	9.4	72.6	17.8	285.9	3.1	0.0
27/10/2016	30.6	13.3	81.8	21.1	180.9	3.0	0.0
28/10/2016	19.2	11.7	95.7	65.6	172.8	2.7	1.6
29/10/2016	28.6	14.1	89.1	40.3	147.9	2.7	0.0
30/10/2016	30.2	13.8	96.5	35.4	242.6	3.5	3.0
31/10/2016	26.5	11.2	87.4	18.3	229.1	3.8	0.0

- Data unavailable due to power outage

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Appendix B

Environmental Monitoring
November 2016

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Mount Thorley Warkworth

Monthly Environmental Report

November 2016

Coal & Allied Operations Pty Ltd

ABN 16 000 023 656

Lemington Road, Ravensworth via Singleton NSW 2330 Australia

PO Box 315 Singleton NSW 2330 Australia

Telephone +61 2 6570 0300 Facsimile +61 2 6570 0399

CONTENTS

Figures

Tables

Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environmental Advisor**	**Final**	**30/12/2016**

1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Mount Thorley Warkworth (MTW). This report includes all monitoring data collected for the period 1st November to 30th November 2016.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

Meteorological data is collected at MTW's 'Charlton Ridge' meteorological station (refer to Figure 3: Air Quality Monitoring Locations).

2.1.1 Rainfall

Rainfall for the period is summarised in Table 1, the year-to-date trend and historical trend are shown in **Error! Reference source not found.**.

Table 1: Monthly Rainfall MTW

2016	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
November	64	598.8

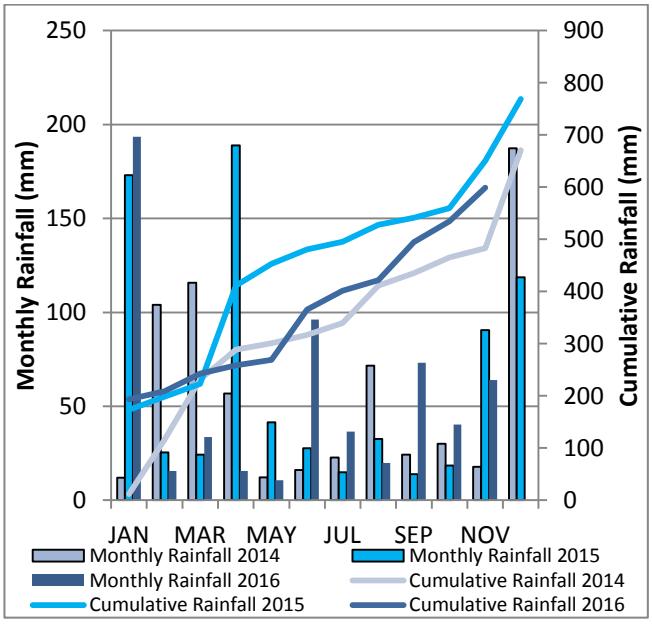


Figure 1: Rainfall Trend YTD

2.1.2 Wind Speed and Direction

Winds from the South and Northwest were dominant throughout the reporting period as shown in **Error! Reference source not found.**.

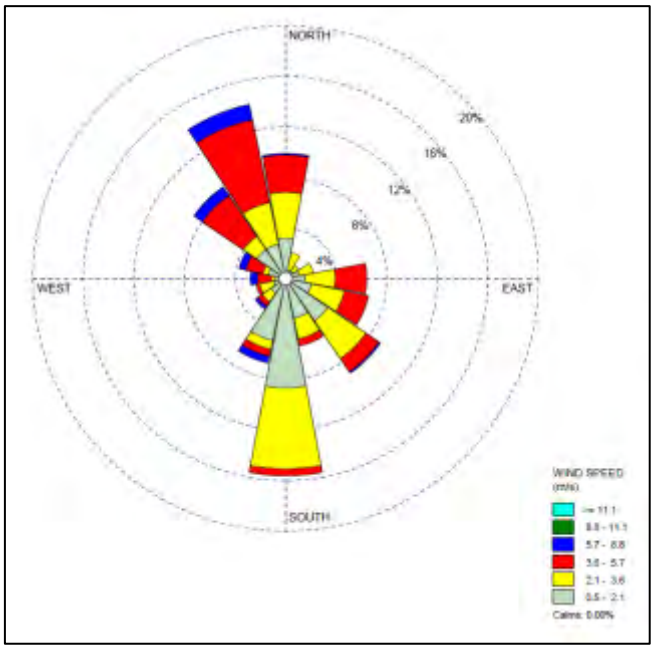


Figure 2: Charlton Ridge Wind Rose – November 2016

Figure 3: Air Quality Monitoring Locations

2.2 Depositional Dust

To monitor regional air quality, MTW operates and maintains a network of nine depositional dust gauges, situated on private and mine owned land surrounding MTW.

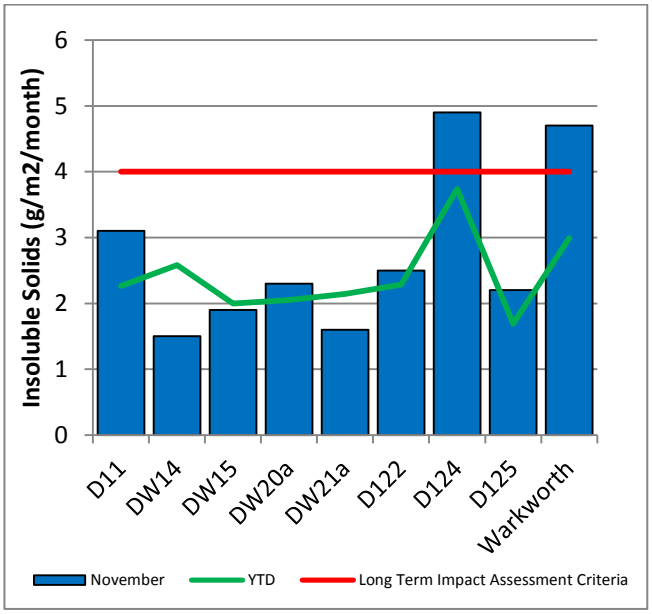


Figure 4 displays insoluble solids results from depositional dust gauges during the reporting period compared against the year-to-date average and the annual impact assessment criteria.

During the reporting period the D124 and Warkworth monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m² per month. Field notes associated with Warkworth confirm the presence of insects and bird droppings. As such the result is considered contaminated and will be excluded from calculation of the annual average. There is no evidence to suggest that the D124 result is contaminated. Accordingly, this result will be included in the annual average calculation.

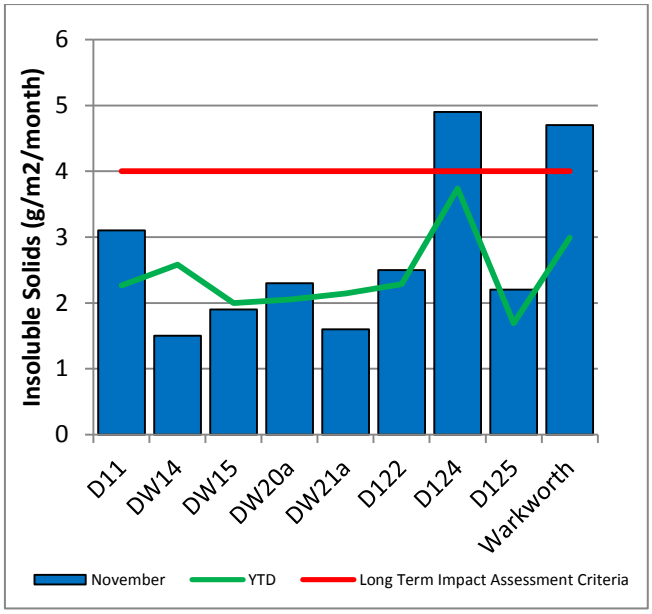


Figure 4: Depositional Dust – November 2016

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM_{10}). The location of these monitors can be found in Figure 3. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

2.3.1 HVAS PM_{10} Results

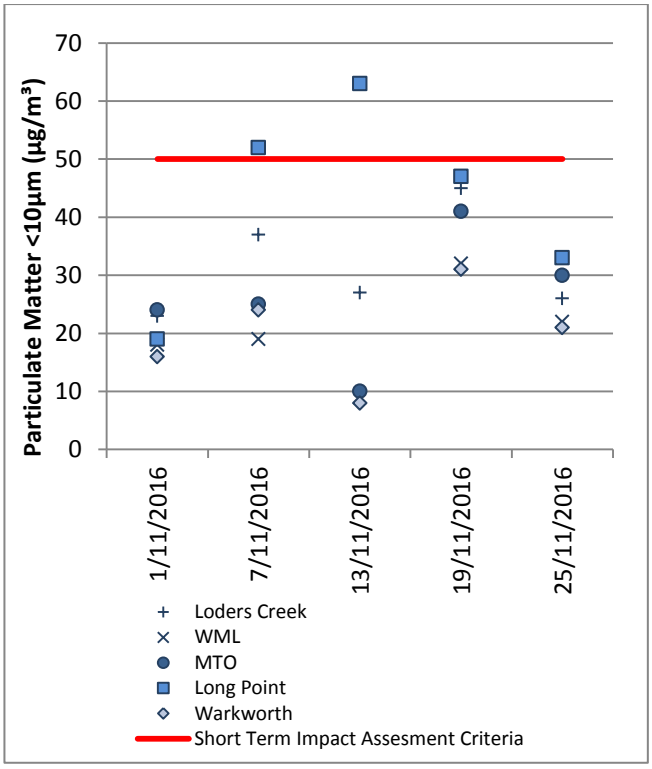


Figure 5 shows the individual PM_{10} results at each monitoring station against the short term impact assessment criteria of 50µg/m³.

On 7/11/2016 and on 13/11/2016 one HVAS PM_{10} unit recorded a result greater than the short term (24hr) PM_{10} impact assessment criteria; Long Point (52 µg/m³ and 63 µg/m³ respectively). Preliminary investigation indicates that MTW is not the main contributor to elevated PM10 levels on these days.

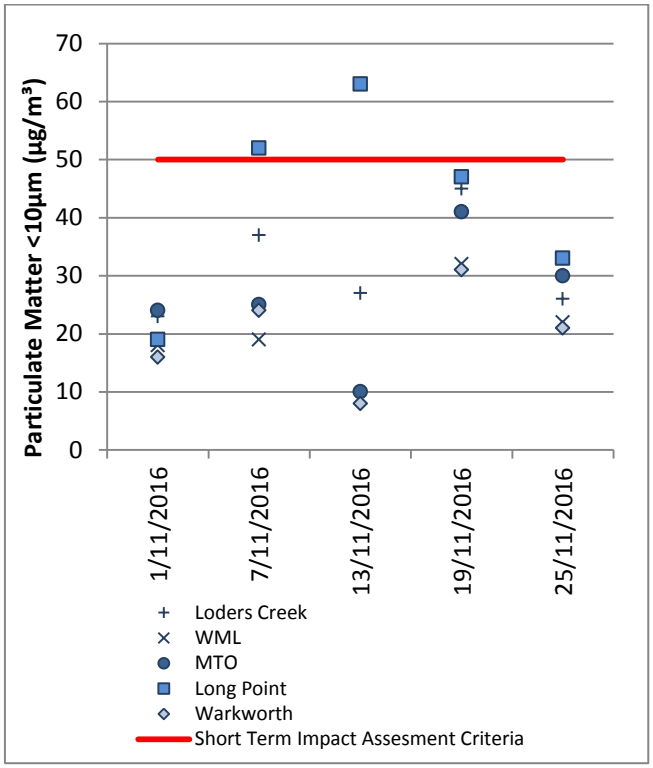


Figure 5: Individual PM_{10} Results – November 2016

Figure 6 shows the annual average PM_{10} results against the long term impact assessment criteria.

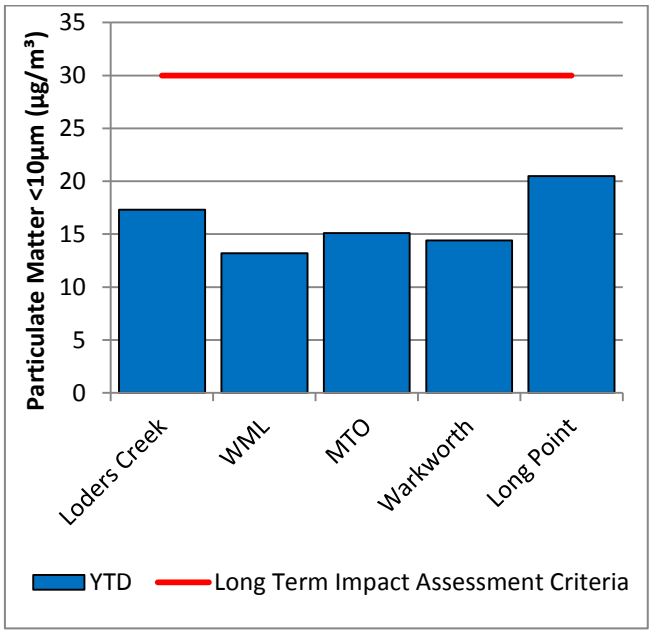


Figure 6: Annual Average PM_{10} – November 2016

2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long term impact assessment criteria of 90µg/m³.

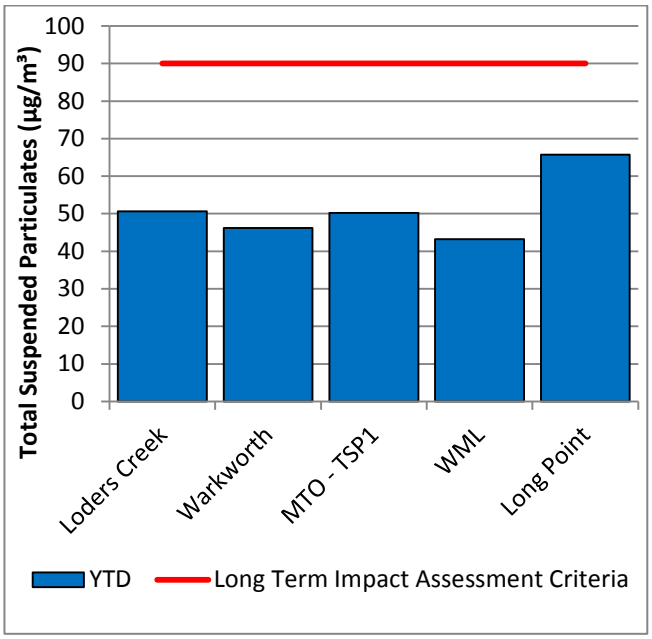


Figure 7: Annual Average Total Suspended Particulates – November 2016

2.3.3 Real Time PM_{10} Results

Mount Thorley Warkworth maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits.

Results for real time dust sampling are shown in Figure 8, including the daily 24 hour average PM_{10} result and the annual PM_{10} average.

2.3.4 Real Time Alarms for Air Quality

During November, the real time monitoring system generated 56 automated air quality related alerts, including 27 alerts for adverse meteorological conditions and 29 alerts for elevated PM_{10} levels.

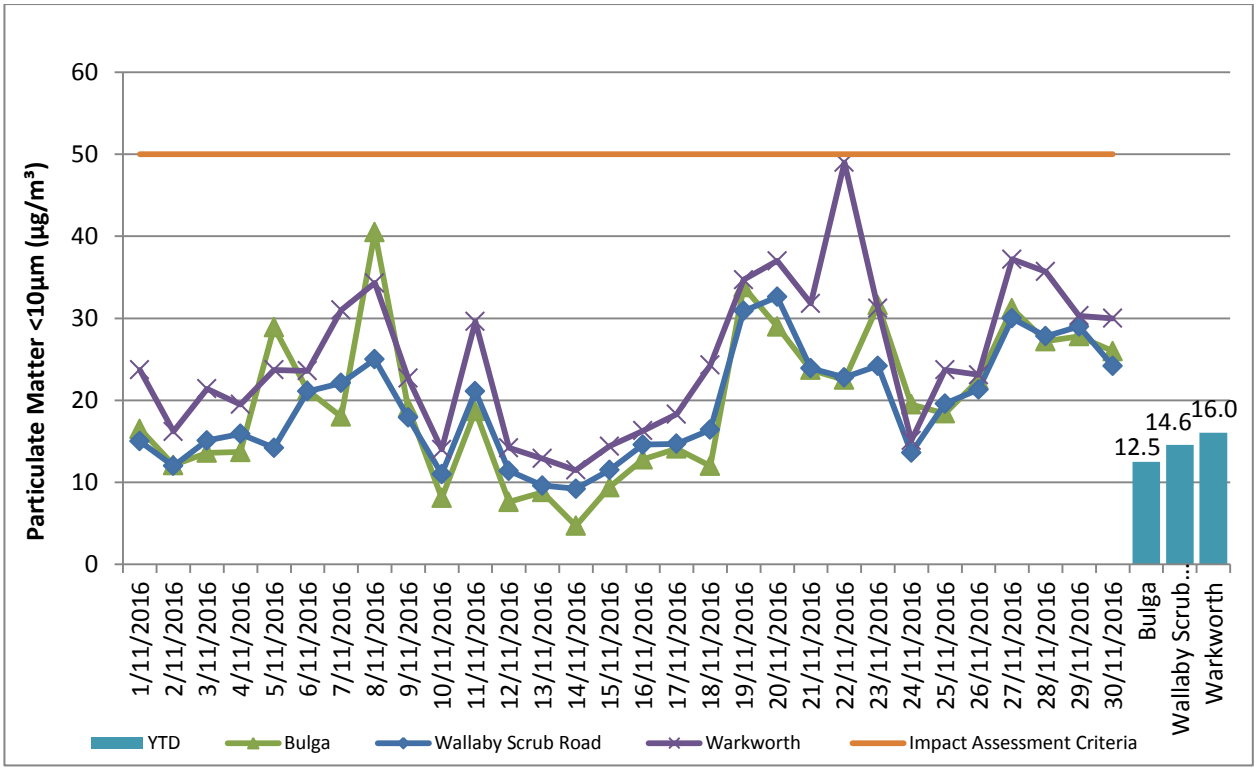


Figure 8: Real Time PM_{10} daily 24hr average and annual average – November 2016

3.0 WATER QUALITY

MTW maintains a network of surface water and groundwater monitoring sites.

3.1 Surface Water

Monitoring is conducted at mine site dams and surrounding natural watercourses.

Surface water courses are sampled on a monthly or quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). The Hunter River and the Wollombi Brook are sampled both upstream and downstream of mining operations, to monitor the potential impact of mining on the river. Other Hunter River tributaries are also monitored.

Results of monitoring are reported quarterly, next available in the December 2016 report.

3.2 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the MTW Groundwater Monitoring Programme.

Groundwater results are reported quarterly, next available in the December 2016 report.

3.3 HRSTS Discharge

MTW participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points Dam 1N and Dam 9S. Discharges can only take place subject to HRSTS regulations.

During the reporting period no water was discharged under the HRSTS.

4.0 BLAST MONITORING

MTW have a network of six blast monitoring units. These are located at nearby privately owned residences and function as regulatory compliance monitors.

The location of these monitors can be found in **Error! Reference source not found.**.

4.1 Blast Monitoring Results

During November 2016, 20 blasts were initiated at MTW. to **Error! Reference source not found.** show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 2.

Table 2: Blasting Limits

Airblast Overpressure (dB(L))	Comments
115	5% of the total number of blasts in a 12 month period
120	0%
Ground Vibration (mm/s)	**Comments**
5	5% of the total number of blasts in a 12 month period
10	0%

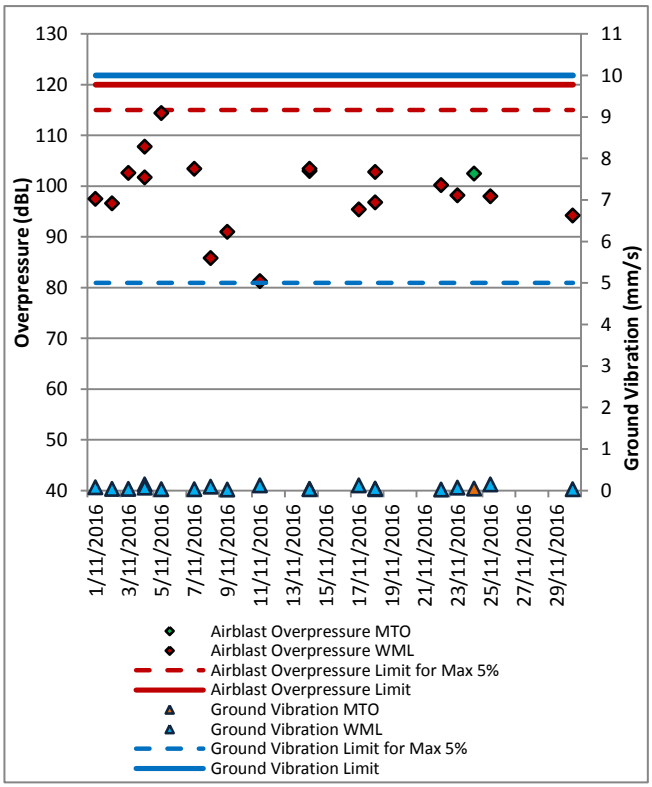


Figure 9: Abbey Green Blast Monitoring Results – November 2016

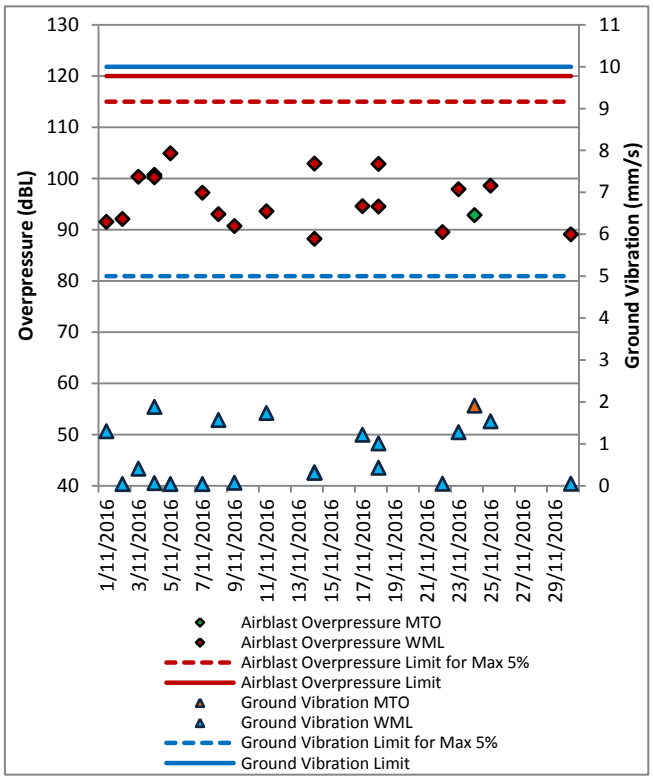


Figure 10: Bulga Village Blast Monitoring Results – November 2016

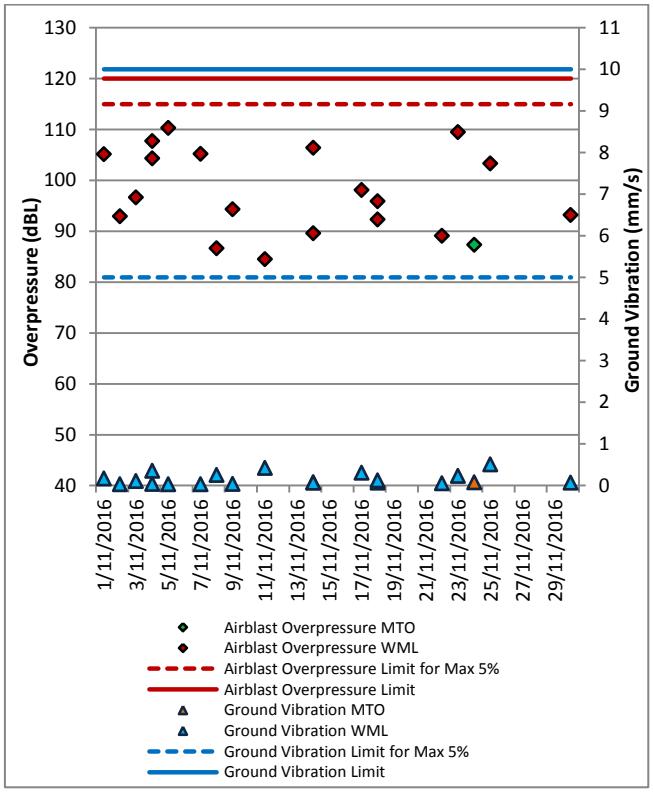


Figure 11: MTIE Blast Monitoring Results – November 2016

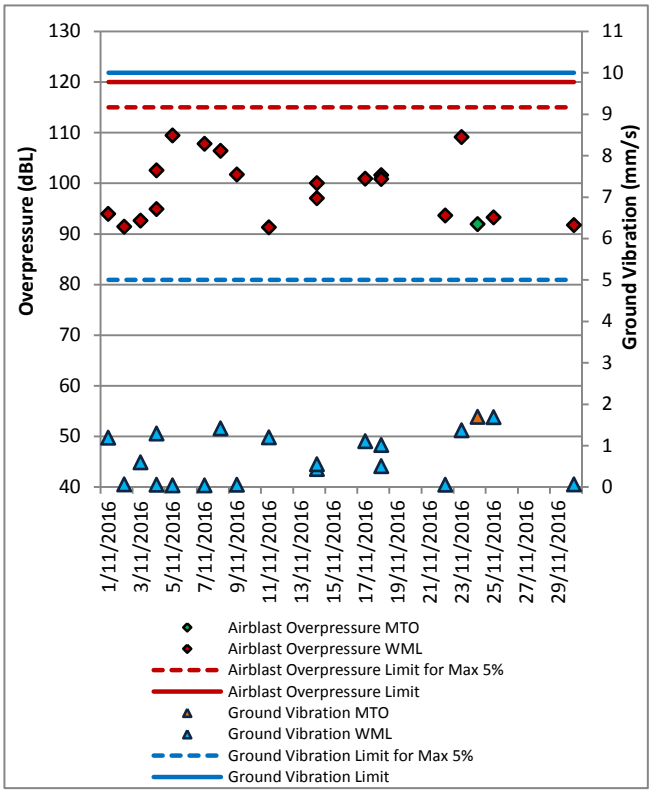


Figure 12: Wollemi Peak Road Blast Monitoring Results – November 2016

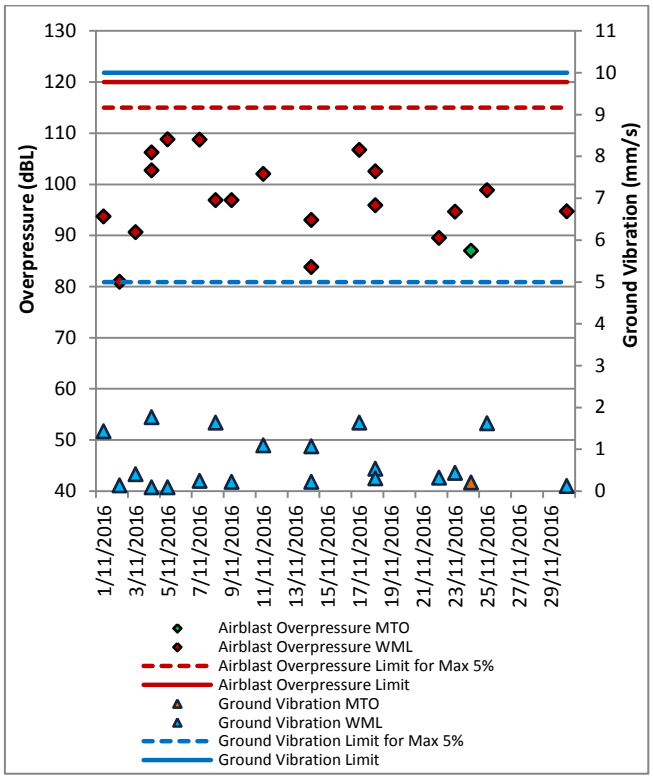


Figure 14: Warkworth Blast Monitoring Results – November 2016

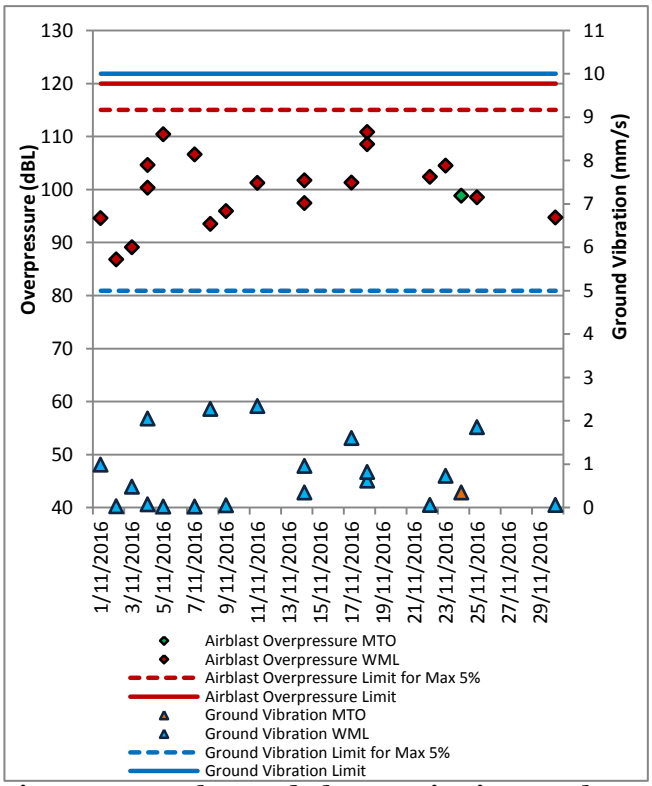


Figure 13: Wambo Road Blast Monitoring Results – November 2016

Figure 15: MTW Blast Monitoring Location Plan

5.0 NOISE

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan. A review against EIS predictions will be reported in the Annual Review. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Real time noise monitoring also occurs at nine sites surrounding MTW. Noise monitoring locations are displayed in Figure 16.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 17th November 2016. All measurements complied with the relevant criteria. Results are detailed in Table 3 to **Error! Reference source not found.**.

5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in Tables 3 and 4.

Table 3: $L_{Aeq,\ 15\ minute}$ Warkworth Impact Assessment Criteria – November 2016

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion (dB(A))	Criterion Applies?[1,6]	WML L_{Aeq} dB[2,4]	Exceedance[3]	Total $L_{Ceq} - L_{Aeq}$	Revised WML L_{Aeq}[5,6]
Bulga RFS	17/11/2016 22:50	1.4	F	35	Yes	<30	Nil	14	<30
Bulga Village	17/11/2016 21:00	3.1	E	38	No	28	NA	15	28
Gouldsville	17/11/2016 21:26	1.6	F	37	Yes	IA	Nil	20	IA
Inlet Rd	17/11/2016 21:22	2.4	F	35	No	32	NA	17	37
Inlet Rd West	17/11/2016 21:48	1.7	F	35	Yes	29	Nil	17	34
Long Point	17/11/2016 21:49	1.7	F	36	Yes	IA	Nil	21	IA
South Bulga	17/11/2016 23:42	1.7	E	35	Yes	<30	Nil	9	<30

Table 4: $L_{Aeq,\ 15\ minute}$ Warkworth - Land Acquisition Criteria – November 2016

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion (dB(A))	Criterion Applies?[1,6]	WML L_{Aeq} dB[2,4]	Exceedance[3]	Total $L_{Ceq} - L_{Aeq}$[7]	Revised WML L_{Aeq}[5,6]
Bulga RFS	17/11/2016 22:50	1.4	F	40	Yes	<30	Nil	14	<30
Bulga Village	17/11/2016 21:00	3.1	E	43	No	28	NA	15	28
Gouldsville	17/11/2016 21:26	1.6	F	43	Yes	IA	Nil	20	IA
Inlet Rd	17/11/2016 21:22	2.4	F	40	No	32	NA	17	37
Inlet Rd West	17/11/2016 21:48	1.7	F	40	Yes	29	Nil	17	34
Long Point	17/11/2016 21:49	1.7	F	40	Yes	IA	Nil	21	IA
South Bulga	17/11/2016 23:42	1.7	E	40	Yes	<30	Nil	9	<30

Notes
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LA1,1minute attributed to Warkworth mine (WML);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

5.1.3 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in Table 5 and 6.

Table 5: $L_{Aeq,\ 15minute}$ Mount Thorley - Impact Assessment Criteria – November 2016

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion dB	Criterion Applies?[1,6]	MTO L_{Aeq} dB[2,4]	Exceedance[3]	Total L_{Ceq} – L_{Aeq}[7]	Revised MTO L_{Aeq}[5,6]
Bulga RFS	17/11/2016 22:50	1.4	F	37	Yes	33	Nil	14	33
Bulga Village	17/11/2016 21:00	3.1	E	38	No	30	NA	15	35
Gouldsville	17/11/2016 21:26	1.6	F	35	Yes	IA	Nil	20	IA
Inlet Rd	17/11/2016 21:22	2.4	F	37	No	32	NA	17	37
Inlet Rd West	17/11/2016 21:48	1.7	F	35	Yes	27	Nil	17	27
Long Point	17/11/2016 21:49	1.7	F	35	Yes	IA	Nil	21	IA
South Bulga	17/11/2016 23:42	1.7	E	36	Yes	30	Nil	9	30

Table 6: $L_{A1,\ 1Minute}$ Mount Thorley - Impact Assessment Criteria – November 2016

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	MTO $L_{A1,\ 1min}$ dB[2,4]	Exceedance[3]
Bulga RFS	17/11/2016 22:50	1.4	F	47	Yes	36	Nil
Bulga Village	17/11/2016 21:00	3.1	E	48	No	32	NA
Gouldsville	17/11/2016 21:26	1.6	F	45	Yes	IA	Nil
Inlet Rd	17/11/2016 21:22	2.4	F	47	No	34	NA
Inlet Rd West	17/11/2016 21:48	1.7	F	45	Yes	33	Nil
Long Point	17/11/2016 21:49	1.7	F	45	Yes	IA	Nil
South Bulga	17/11/2016 23:42	1.7	E	46	Yes	38	Nil

Notes
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LA1,1minute attributed to Mt Thorley Operations (MTO);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

5.1.4 INP Low Frequency

In accordance with the requirements of the NSW Industrial Noise Policy (INP), the low frequency modification factor has been applied where appropriate. It should be noted that the Industrial Noise Policy does not give guidance on the application of the penalty where more than one target noise source is audible. The L_{Ceq} levels reported above are "Total", or "Total mine noise" at best, and cannot be attributed accurately to a single mine. Accordingly, where the INP criteria for the application of the Low Frequency modification factor is triggered, the penalty has been applied to the dominant mine noise source (either of WML or MTO).

Resulting L_{Aeq} noise levels exceeded the WML impact assessment criteria by 2 dB at Inlet Road, and remained in compliance at all other locations.

These results have been reported in writing to the NSW Department of Planning and Environment.

Figure 16: Noise Monitoring Location Plan

5.2 Noise Management Measures

A program of targeted supplementary attended noise monitoring is in place at MTW, supported by the real-time directional monitoring network and ensuring the highest level of noise management is maintained. The supplementary program is undertaken by MTW personnel and involves:

- Routine inspections from both inside and outside the mine boundary;
- Routine and as-required handheld noise assessments (undertaken in response to noise alarm and/or community complaint), comparing measured levels against consent noise limits; and
- Validation monitoring following operational modifications to assess the adequacy of the modifications.

Where a noise assessment identifies noise emissions which are exceeding the relevant noise limit(s) for any particular residence, modifications will be made so as to ensure that the noise event is resolved within 75 minutes of identification. The actions taken are commensurate with the nature and severity of the noise event, but can include:

- Replacement of non-attenuated equipment with sound attenuated equipment;
- Changing the haul route to a less noise sensitive haul;
- Changing dump locations (in-pit or less exposed dump option);
- Reducing equipment numbers;
- Shut down of task; or
- Site shut down.

A summary of these assessments undertaken during November are provided in

.

Table 7: Supplementary Attended Noise Monitoring Data – November 2016

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
461	2	1	0.43

Note: Measurements are taken under all meteorological conditions, including conditions under which the consent noise criteria do not apply.

6.0 OPERATIONAL DOWNTIME

During November, a total of 702.4 hours of equipment downtime was logged in response to environmental events such as dust, noise and adverse meteorological conditions. Operational downtime by equipment type is shown in Figure 17.

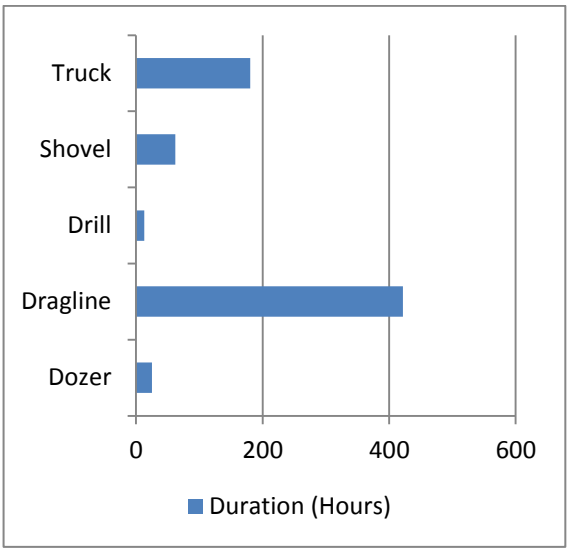


Figure 17: Operational Downtime by Equipment Type – November 2016

7.0 REHABILITATION

During November, 3.4 Ha of land was released, 11.5 Ha of land was bulk shaped, 13.9 Ha of land was topsoiled, 29.9 Ha of land was composted and 23.5 Ha of land was rehabilitated. Year-to-date progress can be viewed in **Error! Reference source not found.**.

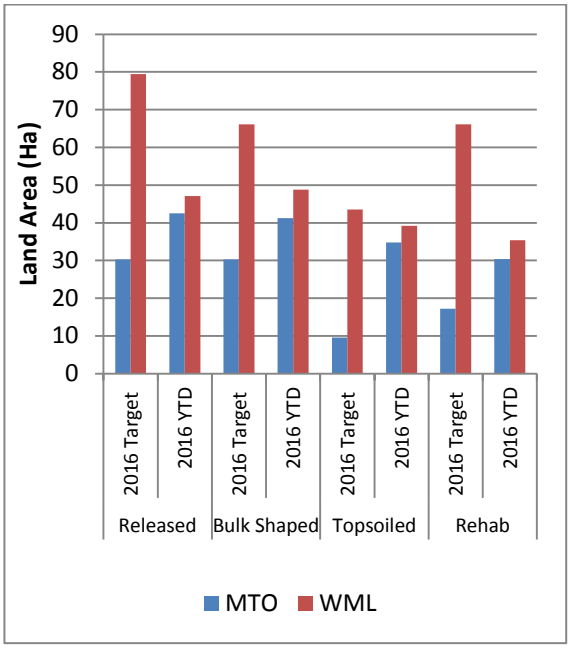


Figure 18: Rehabilitation YTD – November 2016

8.0 ENVIRONMENTAL INCIDENTS

There were no reportable environmental incidents during the reporting period.

9.0 COMPLAINTS

During the reporting period 26 complaints were received, details of these complaints are shown in **Error! Reference source not found.** below.

	Noise	Dust	Blast	Lighting	Other	Total
January	29	1	5	2	2	39
February	24	2	6	1	0	33
March	44	1	2	1	0	48
April	67	7	4	0	5	83
May	17	5	7	2	0	31
June	18	1	4	5	2	30
July	15	1	5	0	11	32
August	48	3	10	1	2	64
September	24	2	6	0	3	35
October	22	6	6	1	1	36
November	13	7	3	2	1	26
December	-	-	-	-	-	-
Total	321	36	58	15	27	457

Figure 19: Complaints Summary - YTD November 2016

Appendix A: Meteorological Data

Table 8: Meteorological Data – Charlton Ridge Meteorological Station – November 2016

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/11/2016	24.4	8.9	70.7	24.7	170.1	2.4	0.0
2/11/2016	26.9	7.9	72.8	18.5	226.0	2.3	0.0
3/11/2016	29.3	8.2	74.1	18.3	212.1	2.4	0.0
4/11/2016	31.3	12.0	80.5	12.1	255.8	3.4	0.0
5/11/2016	29.8	14.6	46.9	2.0	274.3	4.9	0.0
6/11/2016	28.4	12.1	55.8	12.9	257.9	3.8	0.0
7/11/2016	33.5	9.3	71.5	14.3	266.4	3.2	0.0
8/11/2016	36.7	12.8	82.4	10.2	208.5	2.9	2.2
9/11/2016	25.8	15.6	96.5	52.5	158.4	2.3	8.8
10/11/2016	31.1	13.4	96.8	14.7	193.0	2.3	0.0
11/11/2016	30.7	14.3	91.1	29.8	144.3	2.6	0.0
12/11/2016	33.1	15.6	97.5	35.7	251.6	3.9	27.4
13/11/2016	30.9	15.6	81.2	10.9	281.8	4.4	0.0
14/11/2016	25.4	12.2	96.1	29.5	243.9	3.4	24.4
15/11/2016	24.9	11.0	96.3	35.6	186.9	1.8	0.0
16/11/2016	27.7	9.4	94.7	31.3	155.4	2.0	0.0
17/11/2016	27.5	12.0	86.0	31.2	141.7	1.8	0.0
18/11/2016	34.3	11.0	91.7	17.8	211.7	2.7	0.0
19/11/2016	34.1	15.2	80.9	21.8	172.0	2.6	0.0
20/11/2016	30.5	14.8	86.7	35.4	126.2	1.9	0.0
21/11/2016	34.9	17.2	89.1	22.8	192.4	2.7	0.0
22/11/2016	35.8	15.0	86.2	14.3	162.9	2.4	0.0
23/11/2016	35.1	16.4	81.2	15.5	175.3	3.0	0.0
24/11/2016	27.7	13.3	71.9	15.9	171.4	3.0	0.0
25/11/2016	29.5	9.4	88.0	16.2	157.7	2.6	0.0
26/11/2016	31.1	13.3	82.8	15.2	169.1	2.3	0.0
27/11/2016	30.0	17.7	85.4	35.8	144.0	3.3	0.0
28/11/2016	33.9	17.4	89.3	13.3	178.6	2.7	0.0
29/11/2016	34.1	15.3	79.7	12.6	184.5	3.0	0.0
30/11/2016	31.4	15.7	85.6	21.8	148.1	2.4	1.2

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Appendix C

Environmental Monitoring
December 2016

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Mount Thorley Warkworth

Monthly Environmental Report

December 2016

Coal & Allied Operations Pty Ltd

ABN 16 000 023 656

Lemington Road, Ravensworth via Singleton NSW 2330 Australia

PO Box 315 Singleton NSW 2330 Australia

Telephone +61 2 6570 0300 Facsimile +61 2 6570 0399

CONTENTS

Figures

Tables

Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Acting Environmental Specialist**	**Final**	**02/02/2017**

1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Mount Thorley Warkworth (MTW). This report includes all monitoring data collected for the period 1 December to 31 December 2016.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

Meteorological data is collected at MTW's 'Charlton Ridge' meteorological station (refer to Figure 3: Air Quality Monitoring Locations).

2.1.1 Rainfall

Rainfall for the period is summarised in Table 1, the year-to-date trend and historical trend are shown in **Error! Reference source not found.**.

Table 1: Monthly Rainfall MTW

2016	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
December	65.2	664

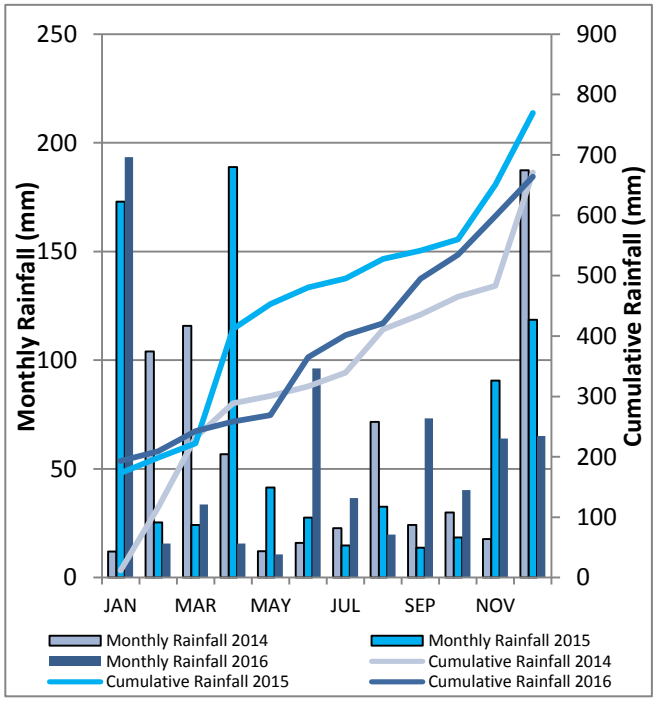


Figure 1: Rainfall Trends YTD

Winds from the Southeast and Northwest were dominant throughout the reporting period as shown in Figure 2.

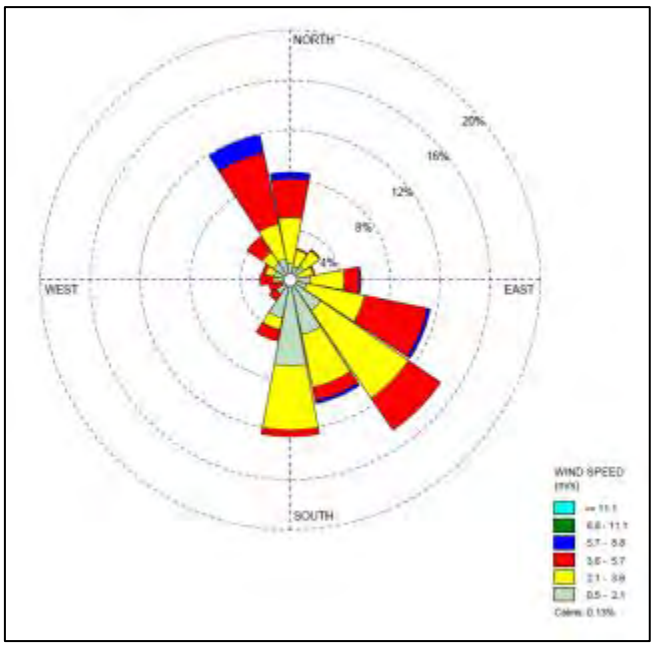


Figure 2: Charlton Ridge Wind Rose – December 2016

Figure 3: Air Quality Monitoring Locations

2.2 Depositional Dust

To monitor regional air quality, MTW operates and maintains a network of nine depositional dust gauges, situated on private and mine owned land surrounding MTW.

Figure 4 displays insoluble solids results from depositional dust gauges during the reporting period compared against the year-to-date average and the annual impact assessment criteria. D124, Warkworth included

During the reporting period the DW14, DW20a, DW21a, D124, D125 and Warkworth monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m^2 per month. Field notes associated with DW14, DW20a, DW21a and D125 confirm the presence of insects and bird droppings. As such the results are considered contaminated and will be excluded from calculation of the annual average. There is no evidence to suggest that the D124 and Warkworth results are contaminated. Accordingly, the results will be included in the annual average calculation.

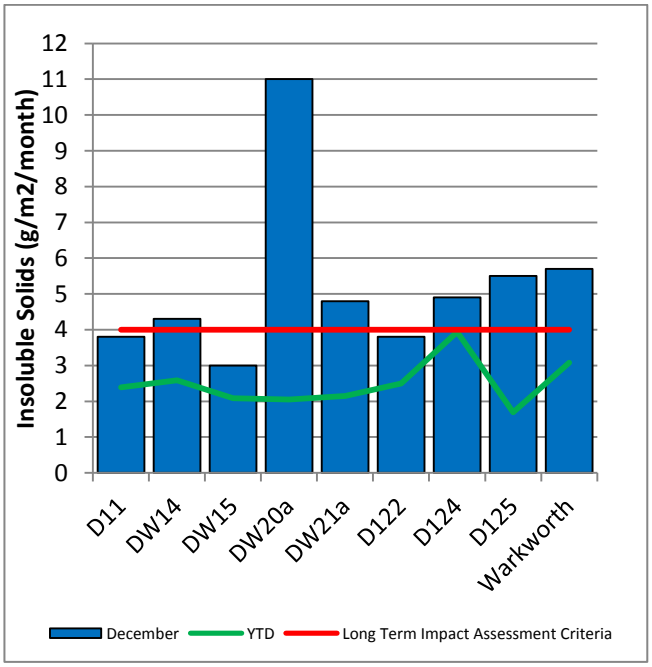


Figure 4: Depositional Dust – December 2016

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM_{10}). The location of these monitors can be found in Figure 3. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

2.3.1 HVAS PM_{10} Results

Figure 5 shows the individual PM_{10} results at each monitoring station against the short term impact assessment criteria of 50µg/m^3.

On 13/12/2016 one HVAS PM_{10} unit recorded a result greater than the short term (24hr) PM_{10} impact assessment criteria; Long Point (53 µg/m^3). On 31/12/2016 two HVAS PM_{10} units recorded results greater than the short term (24hr) PM_{10} impact assessment criteria; Long Point (59 µg/m^3) and Loders Creek (65 µg/m^3).

Preliminary investigation indicates that MTW was outside of the main arc of influence for Long Point on the 13th December and for Long Point and Loder's Creek on the 31st December. Accordingly, no further action is required.

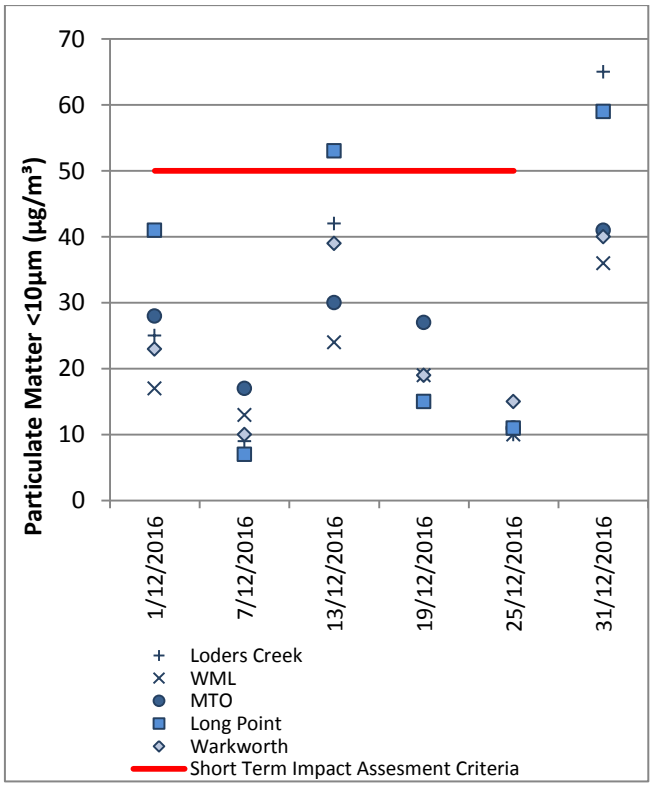


Figure 5: Individual PM_{10} Results – December 2016

Figure 6 shows the annual average PM_{10} results against the long term impact assessment criteria.

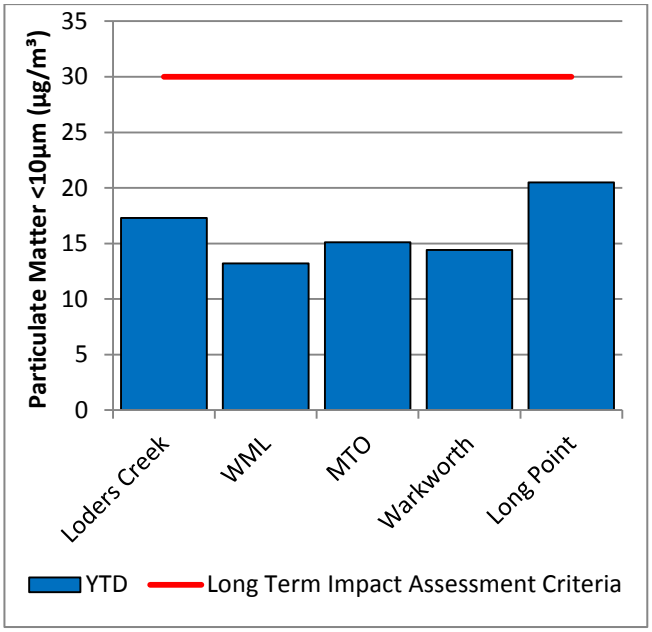


Figure 6: Annual Average PM_{10} – December 2016

2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long term impact assessment criteria of 90µg/m³.

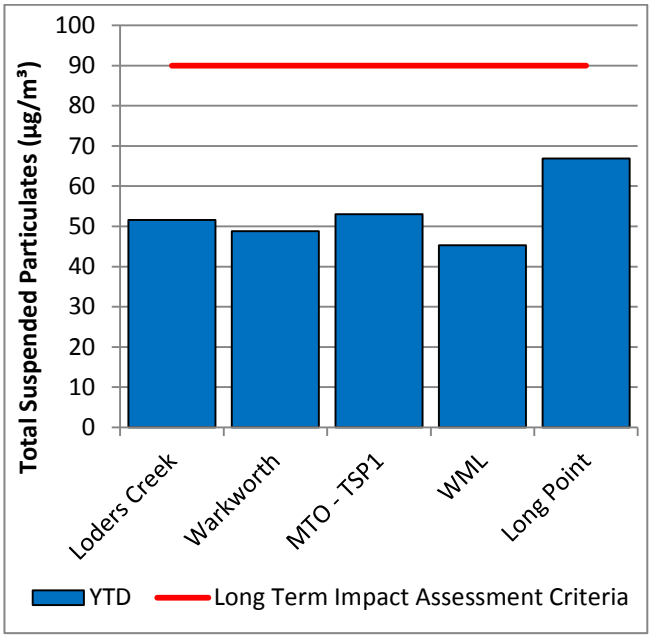


Figure 7: Annual Average Total Suspended Particulates – December 2016

2.3.3 Real Time PM_{10} Results

Mount Thorley Warkworth maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits.

Results for real time dust sampling are shown in Figure 8, including the daily 24 hour average PM_{10} result and the annual PM_{10} average.

2.3.4 Real Time Alarms for Air Quality

During December, the real time monitoring system generated 42 automated air quality related alerts, including 21 alerts for adverse meteorological conditions and 21 alerts for elevated dust levels.

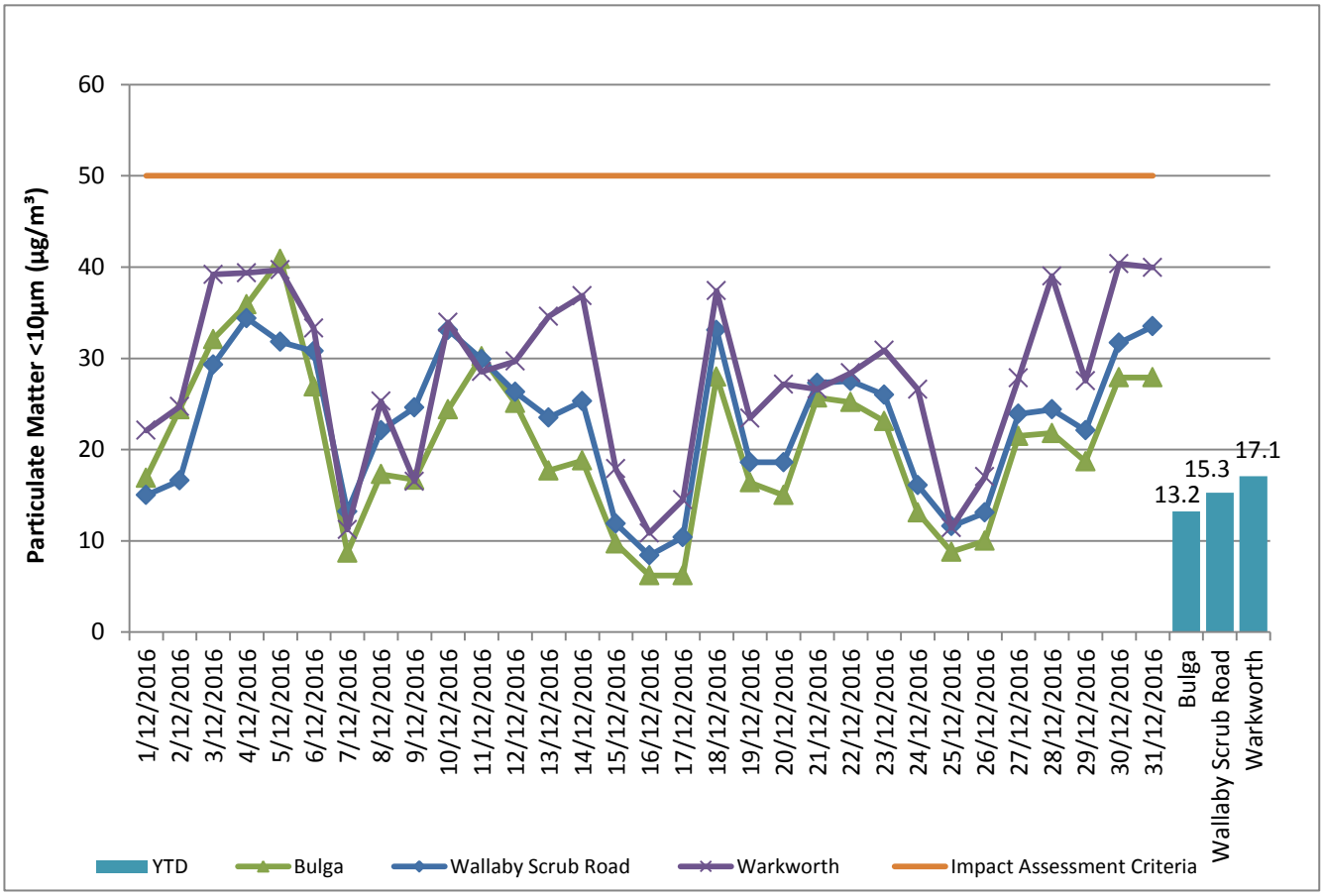


Figure 8: Real Time PM_{10} 24hr average and Year-to-date average – December 2016

3.0 WATER QUALITY

MTW maintains a network of surface water and groundwater monitoring sites.

3.1 Surface Water

Monitoring is conducted at mine site dams and surrounding natural watercourses. The surface water monitoring locations are outlined in Figure 15.

Surface water courses are sampled on a monthly or quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). The Hunter River and the Wollombi Brook are sampled both upstream and downstream of mining operations, to monitor the potential impact of mining on the river. Other Hunter River tributaries are also monitored.

3.1.1 Surface Water Monitoring Results

Figure 9 to Figure 11 show the long term surface water trend (2013 – current) within MTW mine dams. Figure 12 to Figure 14 show the long term surface water trend (2013 - current) in surrounding watercourses.

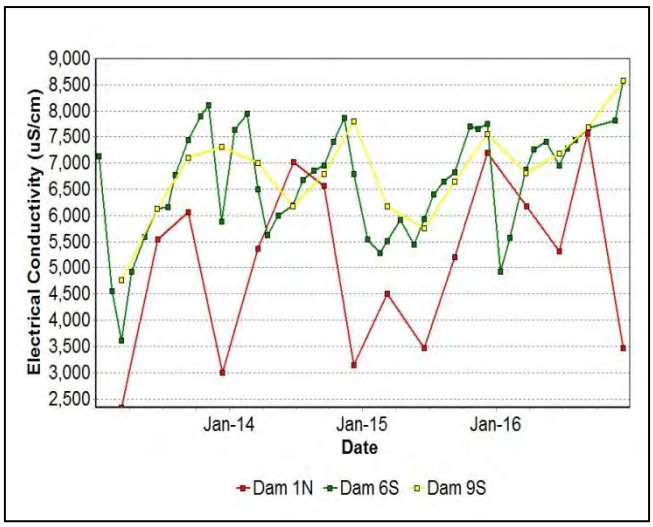


Figure 9: Site Dams Electrical Conductivity Trend 2013 – Current

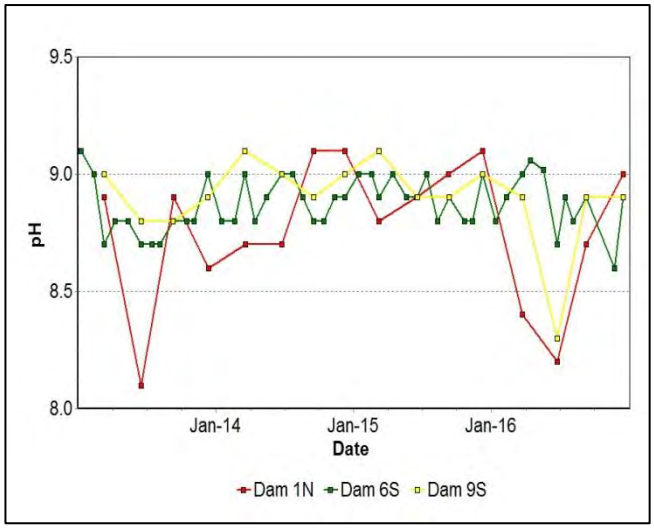


Figure 10: Site Dams pH Trend 2013 - Current

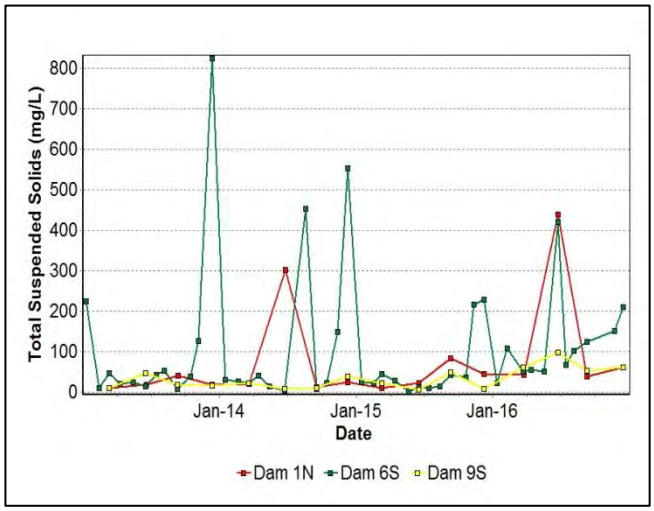


Figure 11: Site Dams Total Suspended Solids Trend 2013 – Current

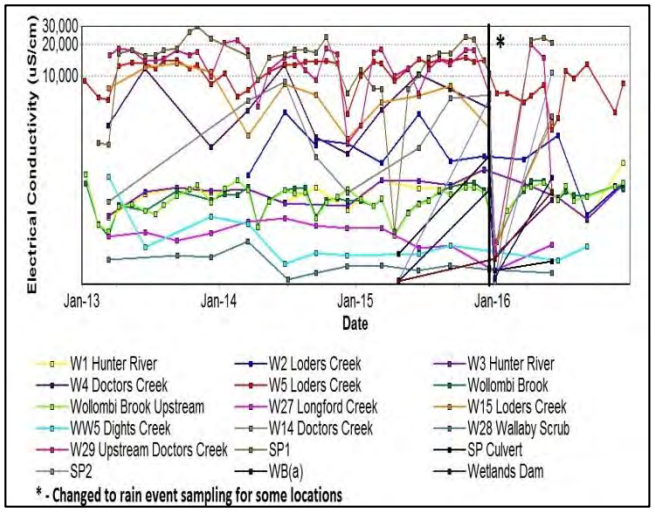


Figure 12: Watercourse Electrical Conductivity Trend 2013 - Current

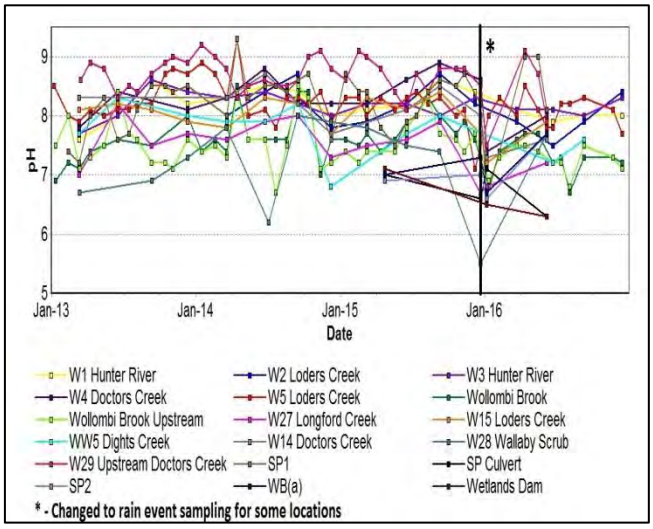


Figure 13: Watercourse pH Trend 2013 – Current

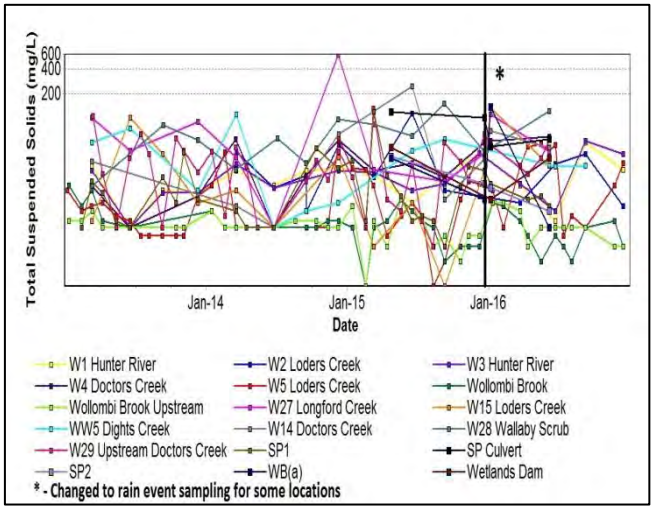


Figure 14: Watercourse Total Suspended Solids Trend 2013 – Current

3.1.2 Surface Water Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis, and to highlight potentially adverse surface water impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the MTW Water Management Plan.

During 2016 19 internal trigger limits were breached, summarised in Table 2.

Table 2: Surface Water Trigger Tracking - December 2016

Site	Date	Trigger Limit Breached	Action Taken in Response
W5	08/09/2016	EC –95th Percentile	Watching Brief*
W1	14/12/2016	EC –95th Percentile	Watching Brief*
SP1	06/01/2016	pH –5th Percentile	Watching Brief*
W2	22/06/2016	pH –5th Percentile	Watching Brief*
W4	06/01/2016	pH –5th Percentile	Watching Brief*
W5	14/12/2016	pH –5th Percentile	Watching Brief*
W15	06/01/2016	pH –5th Percentile	Watching Brief*
W27	06/01/2016	pH –5th Percentile	Watching Brief*
W29	06/01/2016	pH –5th Percentile	Watching Brief*
Wollombi Brook	12/01/2016	pH –5th Percentile	Watching Brief*
Wollombi Brook	03/08/2016	pH –5th Percentile	Cyclical low-pH measurements are consistently seen in the historical trend, consistent with upstream reading. September measurement returned to average levels. No follow up required.
Wollombi Brook Upstream	12/01/2016	pH –5th Percentile	Watching Brief*
Wollombi Brook Upstream	03/08/2016	pH –5th Percentile	Cyclical low-pH measurements are consistently seen in the historical trend, consistent with downstream reading. September measurement returned to average levels. No follow up required.
W1	08/09/2016	TSS – 50mg/L (ANZECC criteria)	Elevated TSS associated with a high-flow event in the river at the time, resulting in mobilisation of sediment. Consistent with nearby W3 measurement. No further action.
W3	08/09/2016	TSS – 50mg/L (ANZECC criteria)	Elevated TSS associated with a high-flow event in the river at the time, resulting in mobilisation of sediment. Consistent with

			nearby W1 measurement. No further action.
W4	06/01/2016	TSS – 50mg/L (ANZECC criteria)	Elevated TSS associated with high runoff due to rainfall event (106mm of rain recorded from 3/01/2016 to 6/01/2016). Consistent with upstream sample W29; no mine site sources of sediment identified. No follow up required.
W14	06/01/2016	TSS – 50mg/L (ANZECC criteria)	Elevated TSS associated with high runoff due to rainfall event (106mm of rain recorded 3/01/2016 to 6/01/2016). Upstream sample W29 indicates source of sediment primarily from runoff from downstream farming properties. No follow up required.
W15	06/01/2016	TSS – 50mg/L (ANZECC criteria)	W15: Elevated TSS associated with high runoff due to rainfall event (106mm of rain recorded 3/01/2016 to 6/01/2016). W5 not on revised rain event sampling protocol so unable to determine sediment source. Monitoring programme to be updated to include W5 on rain event sampling protocol.
W27	06/01/2016	TSS – 50mg/L (ANZECC criteria)	Elevated TSS associated with high runoff due to rainfall event (106mm of rain recorded 3/01/2016 to 6/01/2016). Review of site indicates upstream erosion and sediment controls in place and compliant. No follow up required.

* = Watching brief established pending outcomes of subsequent monitoring events. No specific actions required.

Figure 15: Surface Water Monitoring Location Plan

3.2 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the MTW Groundwater Monitoring Programme.

Figures 16 to 58 show the long term water quality trends (2013 – current) for groundwater bores monitored at MTW.

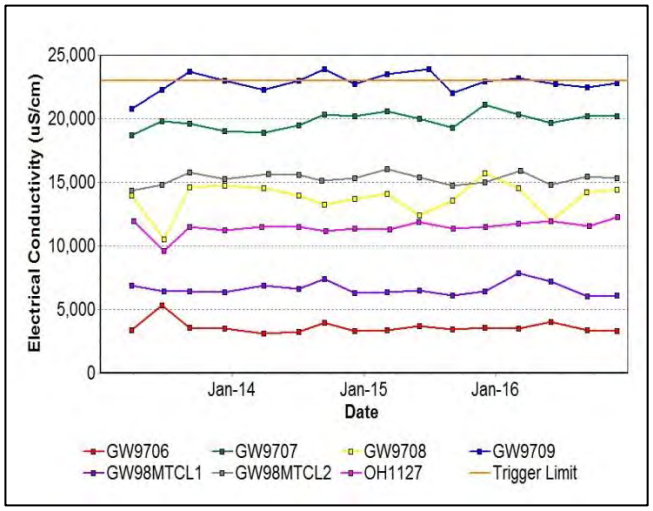


Figure 16: Bayswater Seam Electrical Conductivity Trend – December 2016

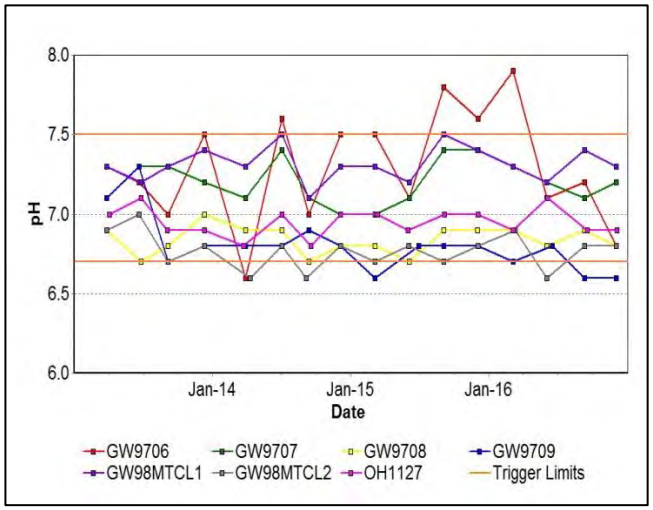


Figure 17: Bayswater Seam pH Trend – December 2016

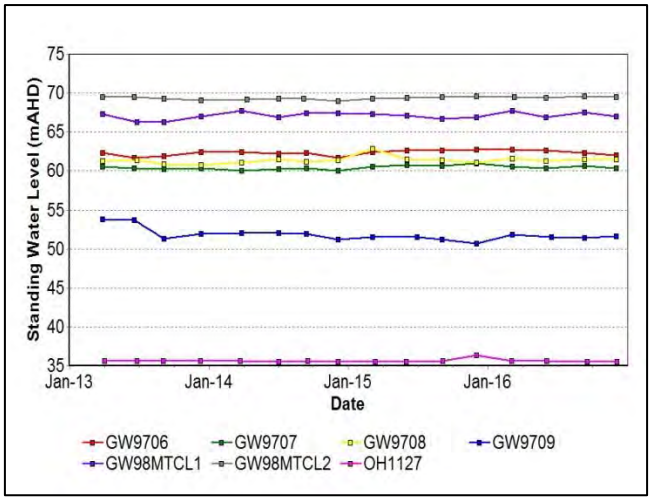


Figure 18: Bayswater Seam Standing Water Level - December 2016

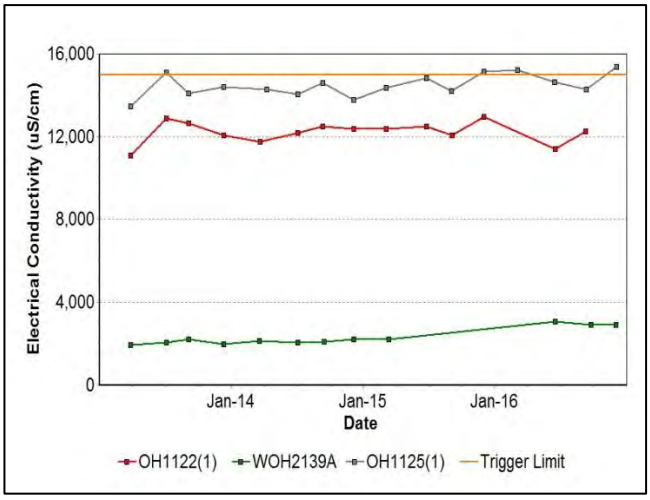


Figure 19: Blakefield Seam Electrical Conductivity Trend - December 2016

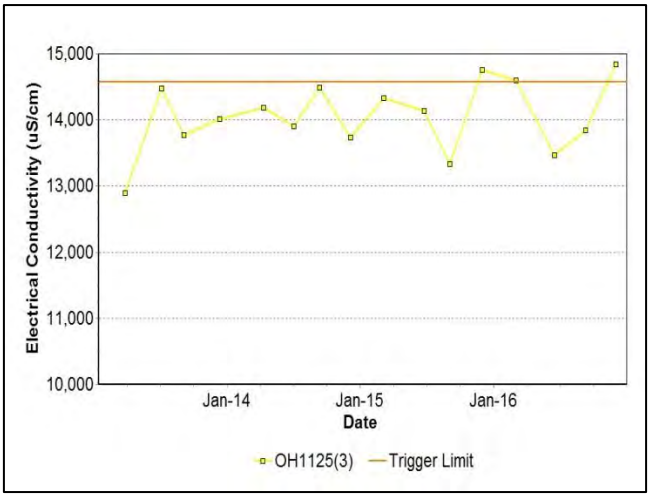


Figure 22: Bowfield Seam Electrical Conductivity Trend - December 2016

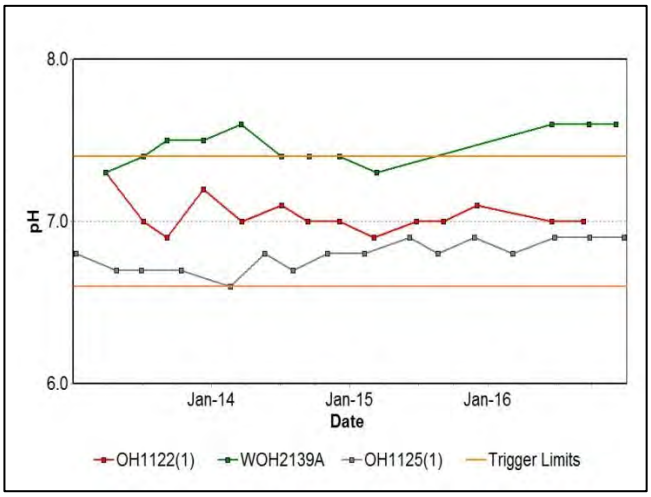


Figure 20: Blakefield Seam pH Trend - December 2016

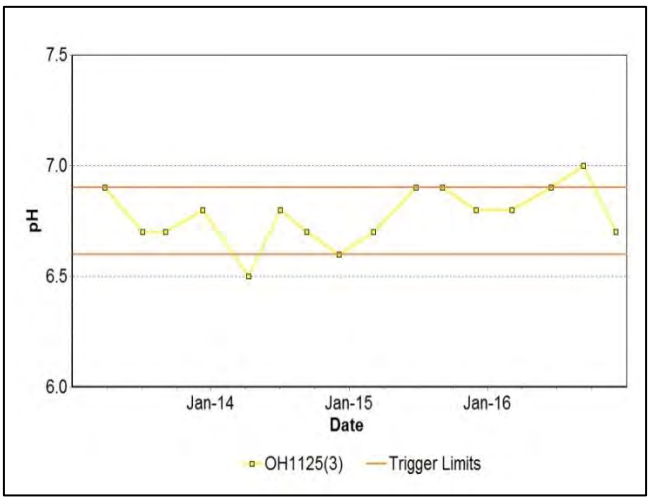


Figure 23: Bowfield Seam pH Trend – December 2016

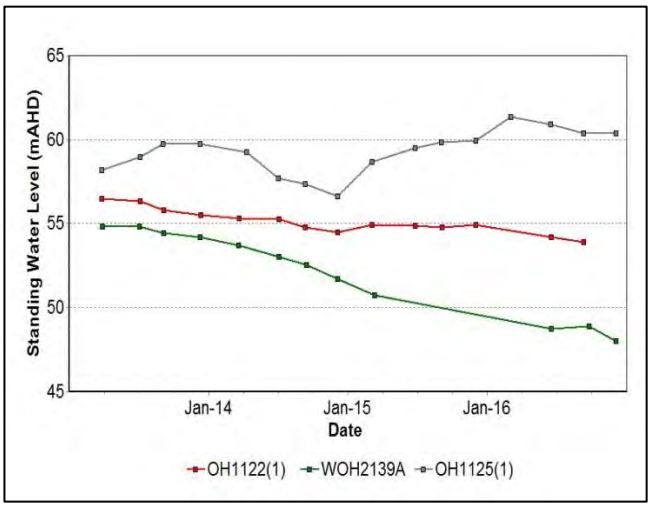


Figure 21: Blakefield Seam Standing Water Level Trend - December 2016

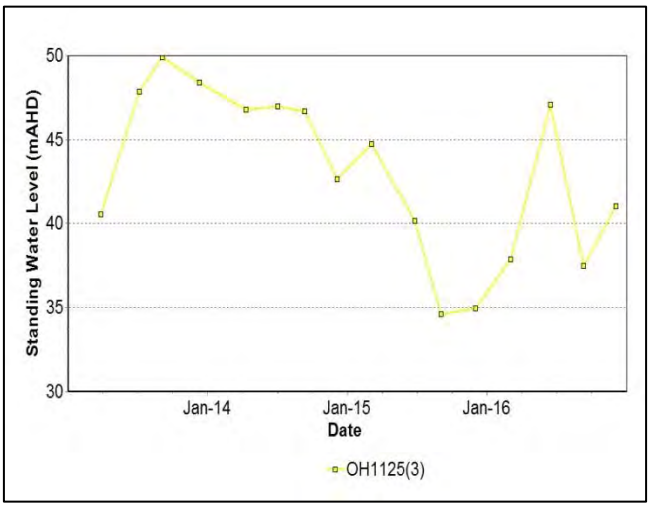


Figure 24: Bowfield Seam Standing Water Level Trend - December 2016

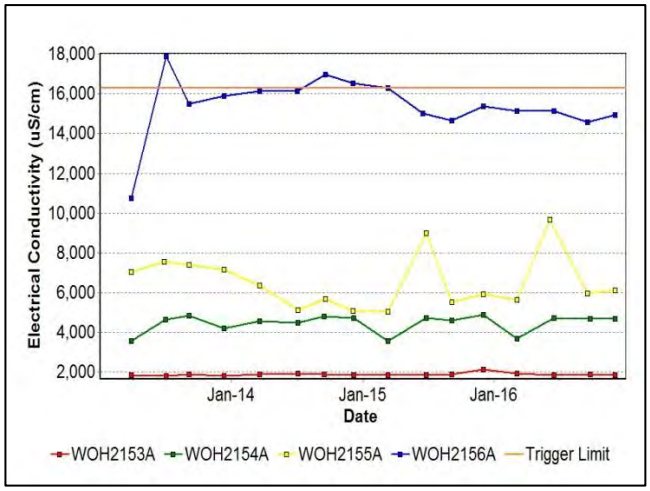


Figure 25: Redbank Seam Electrical Conductivity Trend - December 2016

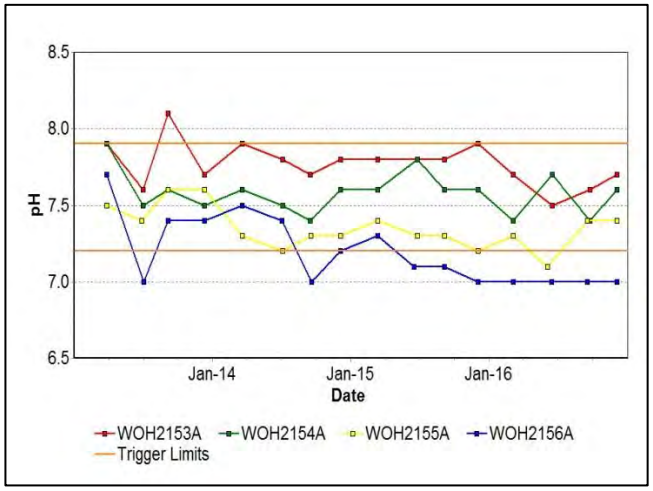


Figure 26: Redbank Seam pH Trend – December 2016

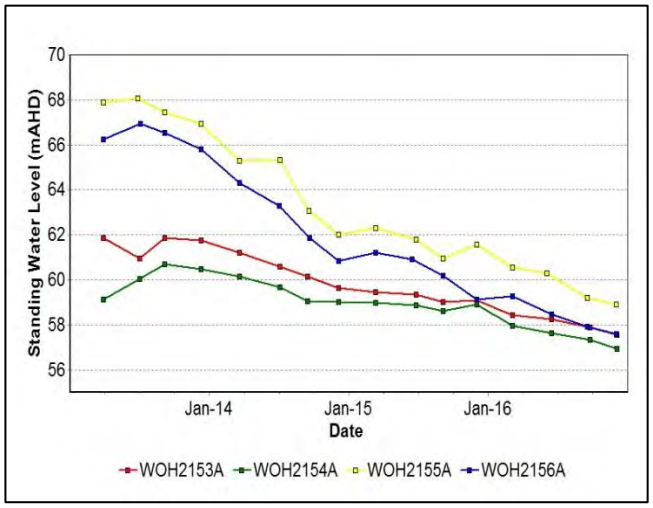


Figure 27: Redbank Seam Standing Water Level - December 2016

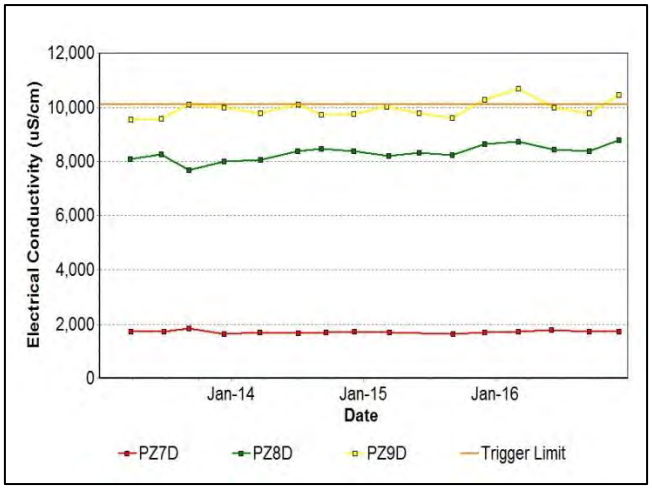


Figure 28: Shallow Overburden Seam Electrical Conductivity Trend - December 2016

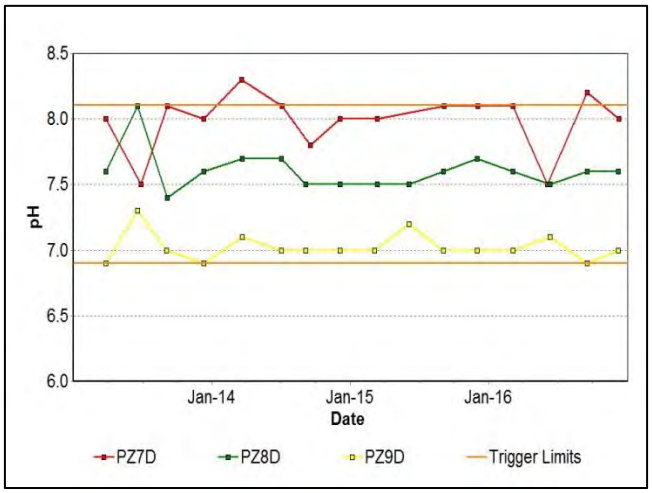


Figure 29: Shallow Overburden Seam pH Trend - December 2016

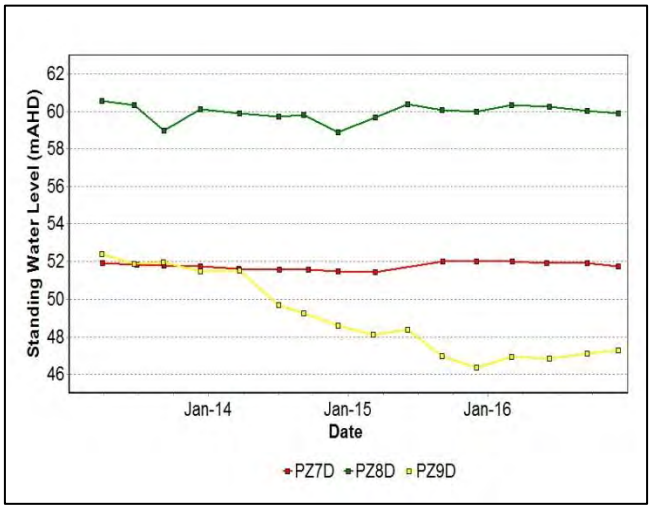


Figure 30: Shallow Overburden Seam Standing Water Level Trend - December 2016

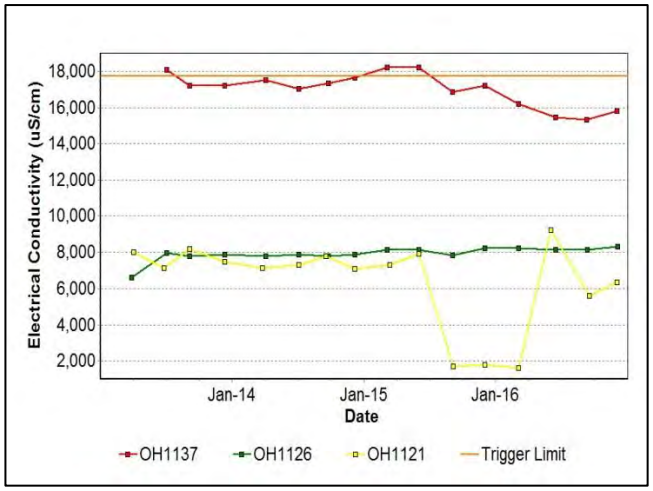


Figure 31: Vaux Seam Electrical Conductivity Trend – December 2016

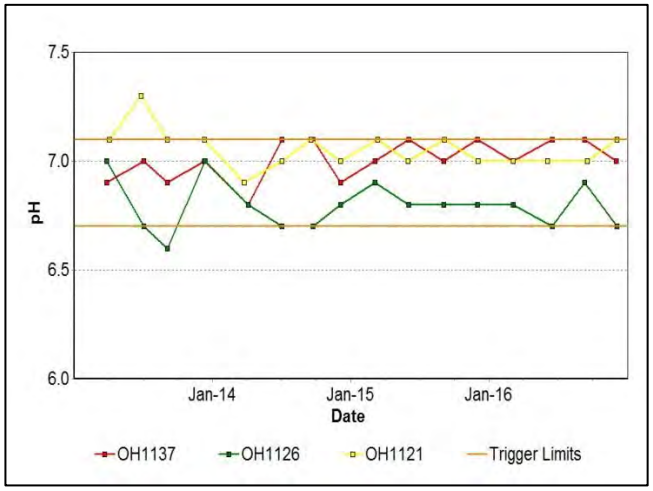


Figure 32: Vaux Seam pH Trend - December 2016

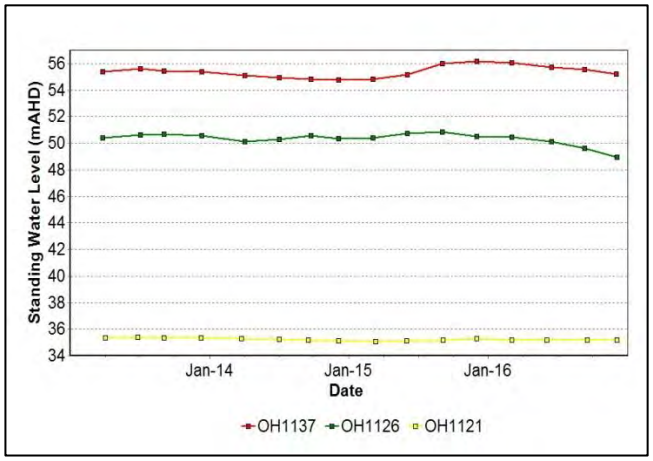


Figure 33: Vaux Seam Standing Water Level Trend - December 2016

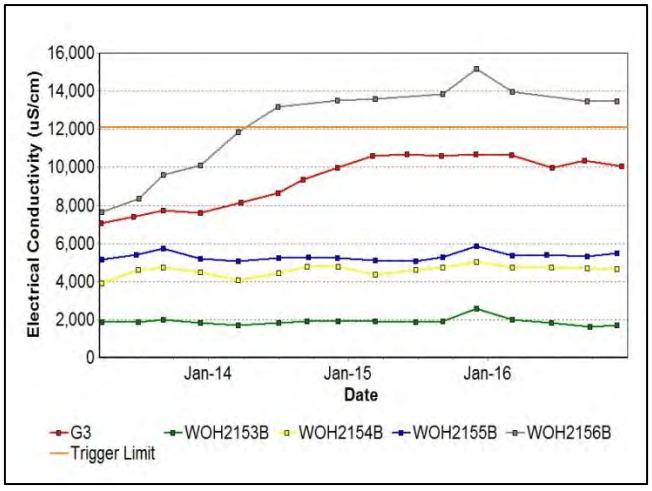


Figure 34: Wambo Seam Electrical Conductivity Trend - December 2016

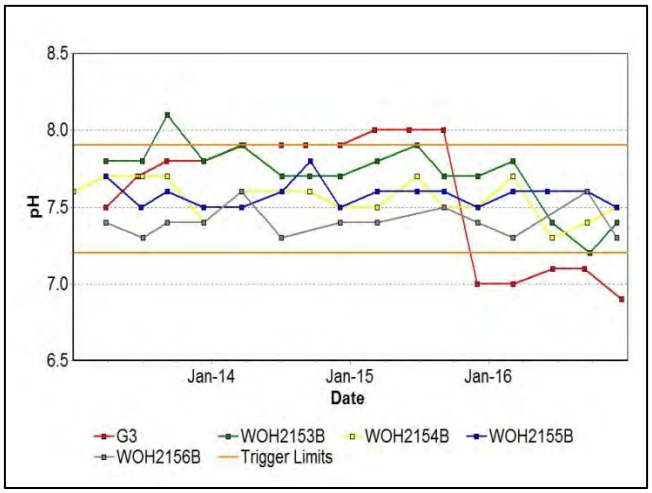


Figure 35: Wambo Seam pH Trend – December 2016

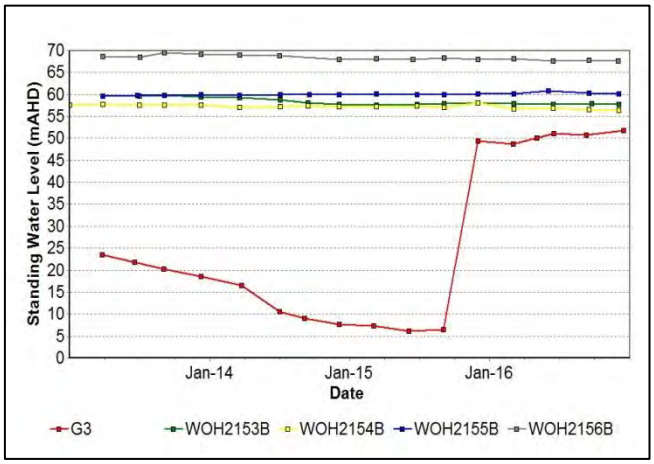


Figure 36: Wambo Seam Standing Water Level Trend - December 2016

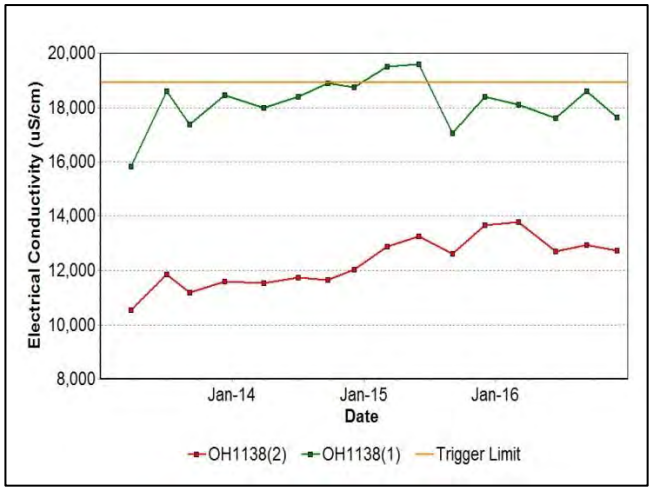


Figure 37: Warkworth Seam Electrical Conductivity Trend – December 2016

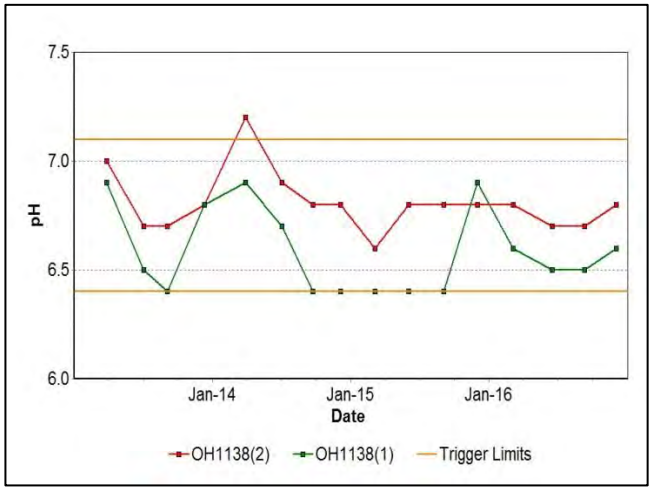


Figure 38: Warkworth Seam pH Trend - December 2016

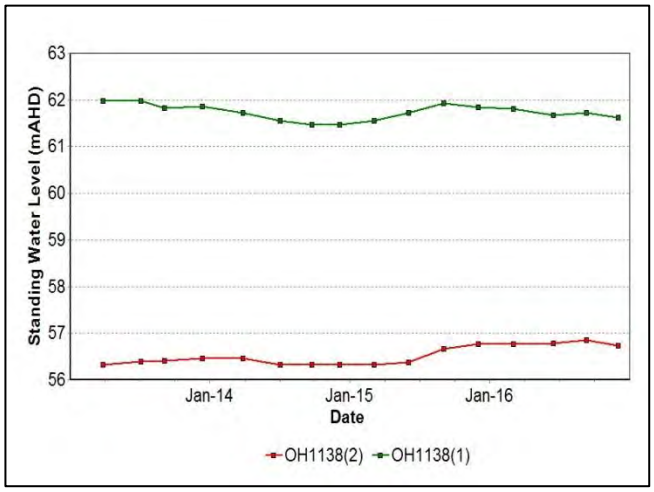


Figure 39: Warkworth Seam Standing Water Level Trend - December 2016

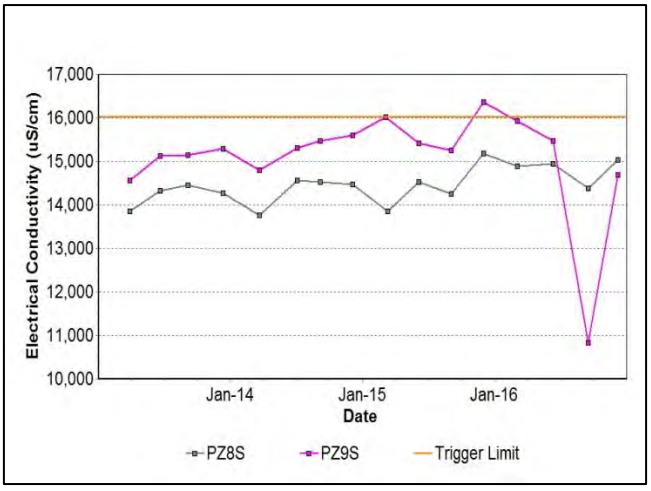


Figure 40: Wollombi Alluvium Electrical Conductivity Trend - December 2016

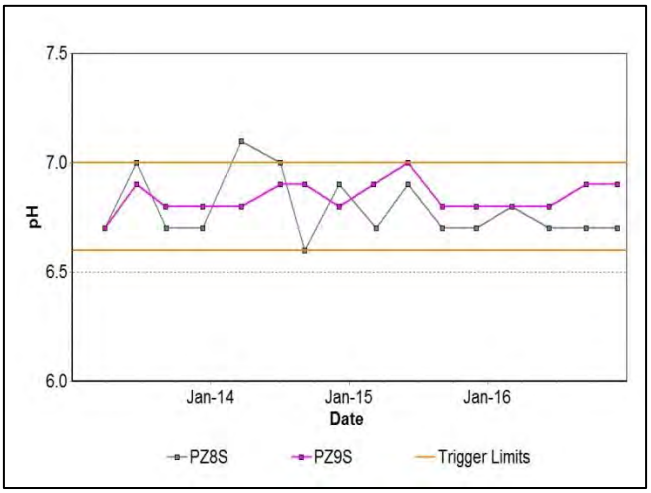


Figure 41: Wollombi Alluvium pH Trend – December 2016

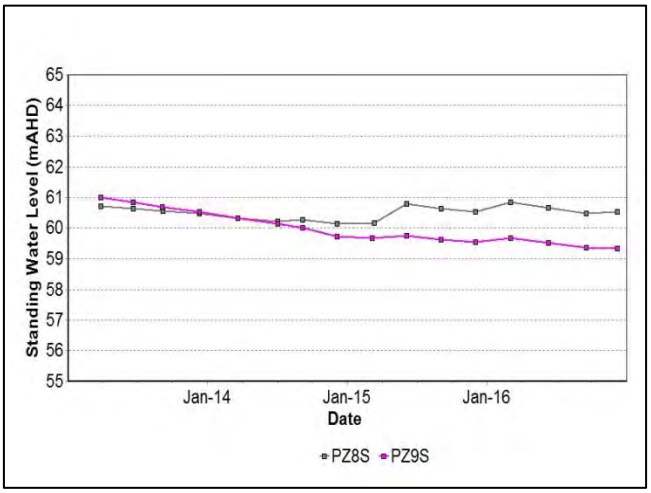


Figure 42: Wollombi Alluvium Standing Water Level Trend - December 2016

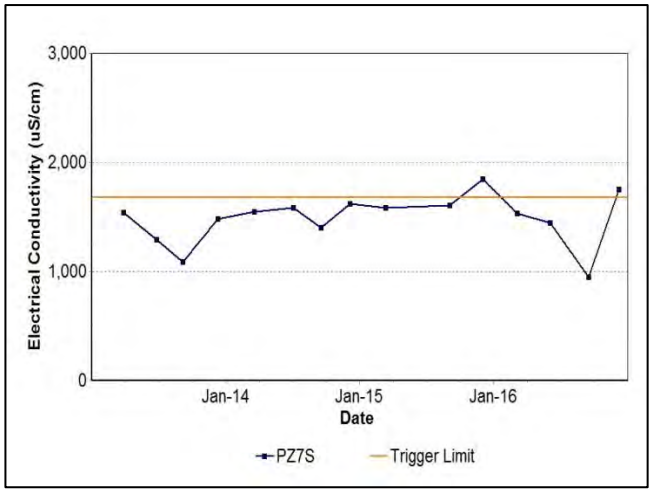


Figure 43: Aeolian Warkworth Sands Electrical Conductivity Trend – December 2016

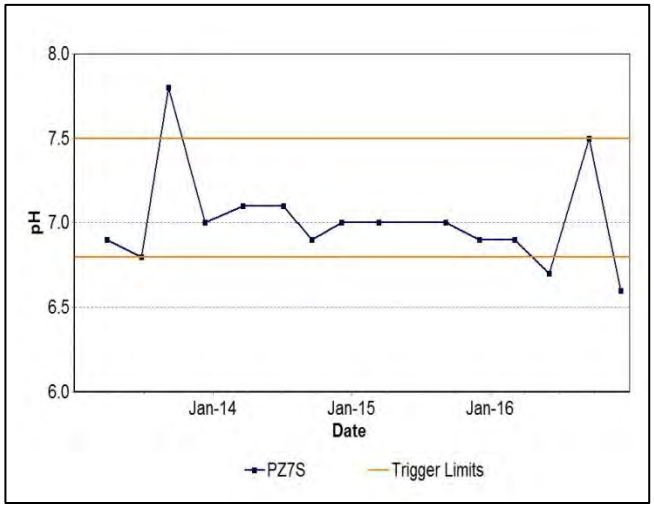


Figure 44: Aeolian Warkworth Sands pH Trend - December 2016

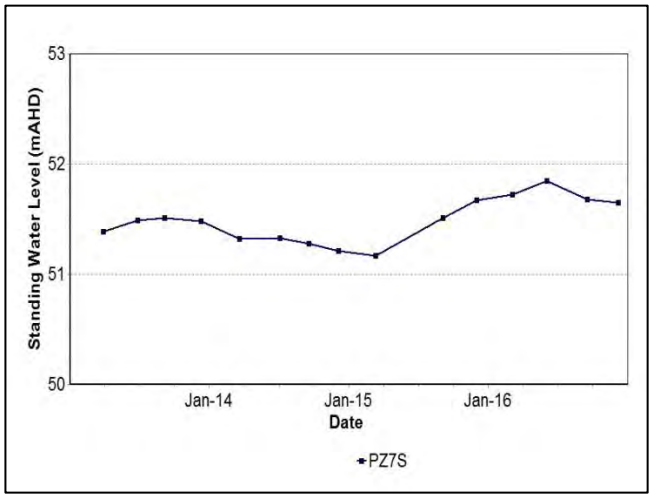


Figure 45: Aeolian Warkworth Sands Standing Water Level Trend - December 2016

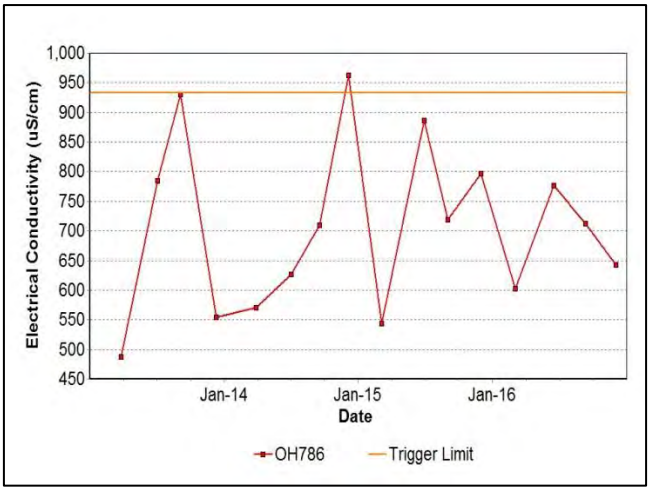


Figure 46: Hunter River Alluvium 1 Seam Electrical Conductivity - December 2016

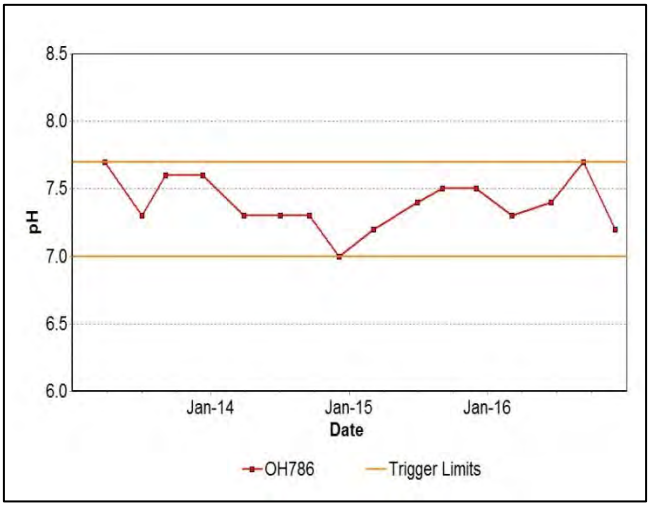


Figure 47: Hunter River Alluvium 1 Seam pH Trend - December 2016

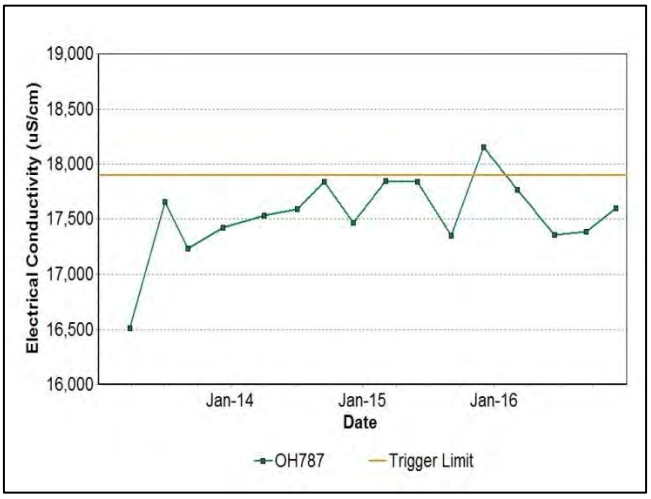


Figure 48: Hunter River Alluvium 2 Seam Electrical Conductivity - December 2016

Figure 49: Hunter River Alluvium 2 Seam pH Trend - December 2016

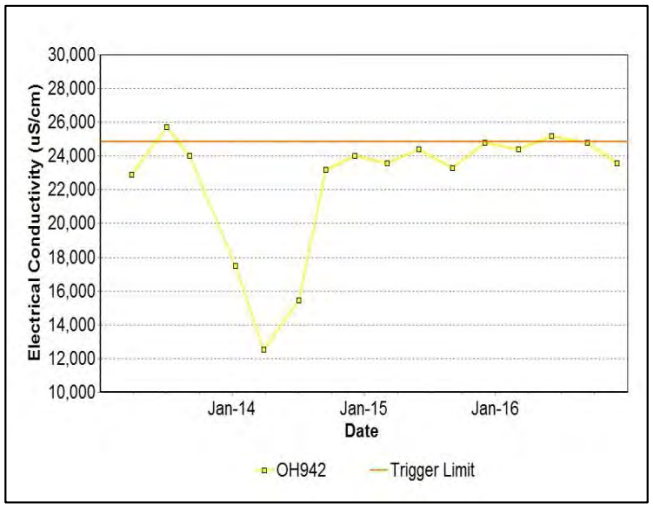


Figure 50: Hunter River Alluvium 3 Seam Electrical Conductivity - December 2016

Figure 51: Hunter River Alluvium 3 Seam pH Trend - December 2016

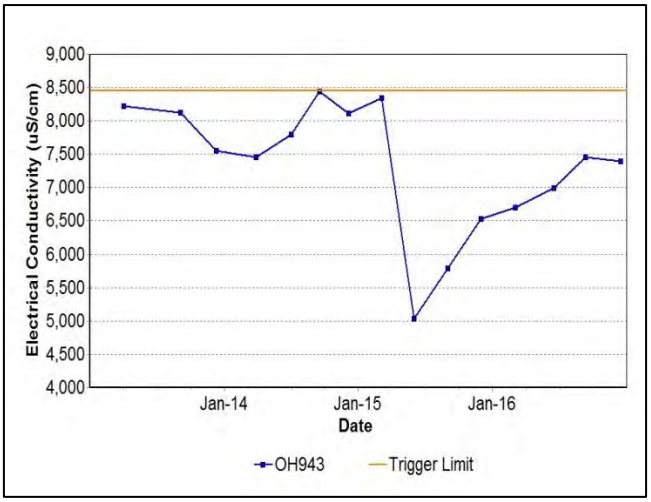


Figure 52: Hunter River Alluvium 4 Seam Electrical Conductivity - December 2016

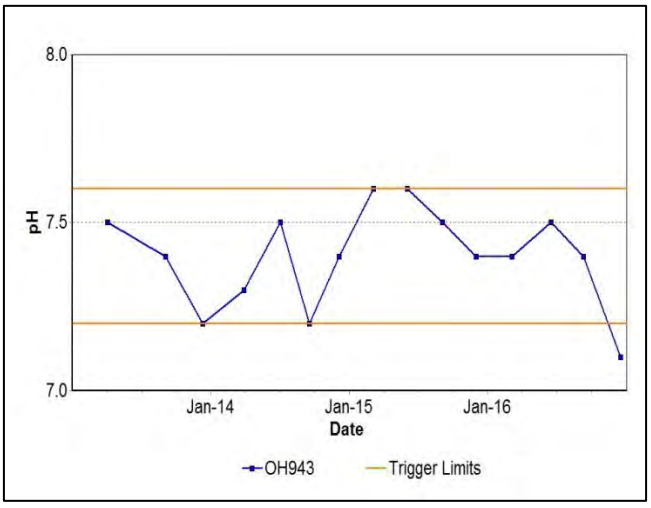


Figure 53: Hunter River Alluvium 4 Seam pH Trend - December 2016

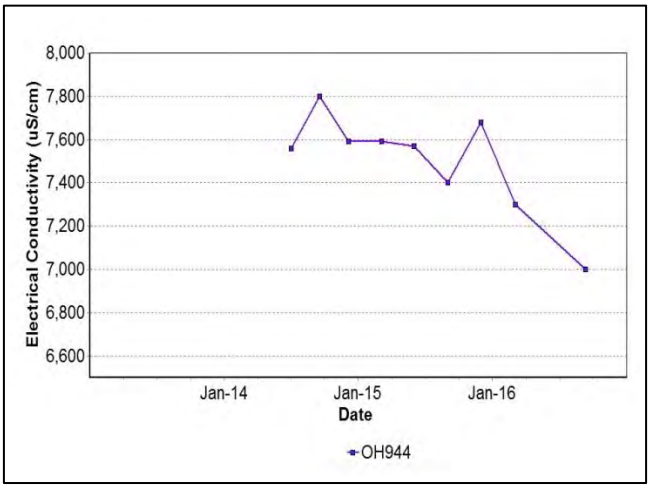


Figure 54: Hunter River Alluvium 5 Seam Electrical Conductivity - December 2016

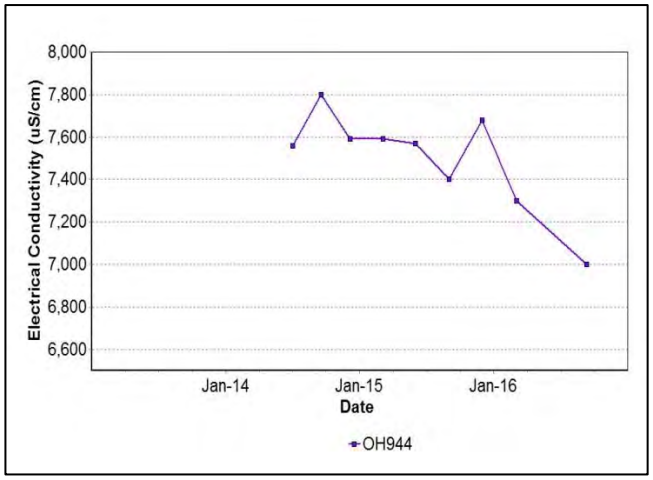


Figure 55: Hunter River Alluvium 5 Seam pH Trend - December 2016

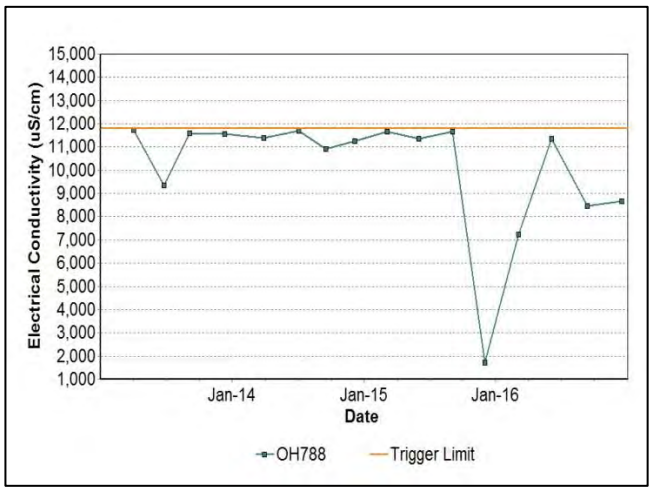


Figure 56: Hunter River Alluvium 6 Seam Electrical Conductivity - December 2016

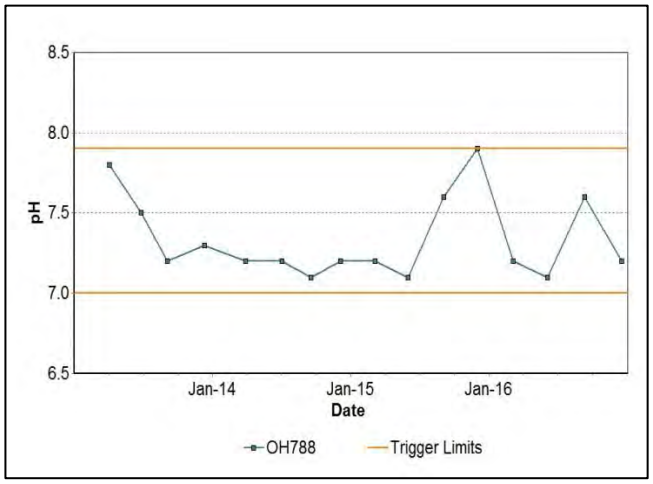


Figure 57: Hunter River Alluvium 6 Seam pH Trend - December 2016

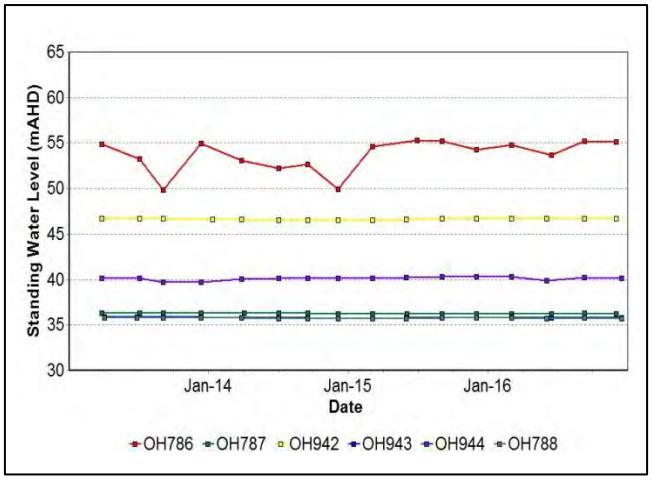


Figure 58: Hunter River Alluvium Standing Water Level Trend - December 2016

3.2.1 Groundwater Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis, and to highlight potentially adverse groundwater impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the MTW Water Management Plan. Locations of groundwater bores are shown in Figure 59.

During 2016 a number of trigger limits were breached and investigated, summarised in Table 3.

Table 3: Groundwater Triggers - 2016

Site	Date	Trigger Limit Breached	Action Taken in Response
GW9709	04/03/2016	EC – 95th Percentile	Watching Brief*
OH1125(3)	03/03/2016	EC – 95th Percentile	Watching Brief*
OH1125(1)	03/03/2016	EC – 95th Percentile	Watching Brief*
OH1125(1)	02/12/2016	EC – 95th Percentile	Watching Brief*
OH1125(3)	02/12/2016	EC – 95th Percentile	Watching Brief*
PZ9D	03/03/2016	EC – 95th Percentile	Watching Brief*
PZ9D	07/12/2016	EC – 95th Percentile	Watching Brief*
PZ7S	07/12/2016	EC – 95th Percentile	Watching Brief*
WOH2156B	04/03/2016	EC – 95th Percentile	Elevated EC is likely the result of coal seam depressurisation, as evidenced by falling water level. This trend is consistent with effects of nearby mining. No further action required.
WOH2156B	16/09/2016	EC – 95th Percentile	EC measurement stable and consistent with historical trend of Wambo Seam bores. Maintain watching brief.
WOH2156B	02/12/2016	EC – 95th Percentile	Results are stable and consistent with historical trend. No further action required.
OH942	02/06/2016	EC – 95th Percentile	Watching Brief*
OH942	03/03/2016	PH –5th Percentile	Watching Brief*
OH943	15/12/2016	PH –5th Percentile	Watching Brief*
OH944	03/03/2016	PH –5th Percentile	Watching Brief*
OH1125(3)	09/09/2016	PH – 95th Percentile	Watching Brief*
PZ7S	03/03/2016	PH –5th Percentile	Watching Brief*
PZ7S	07/12/2016	PH –5th Percentile	Watching Brief*
GW9706	04/03/2016	PH – 95th Percentile	Trend consistent with nearby monitoring bore GW9707. Water level steady and does not indicate impact due to mining. Watching brief to be maintained.
GW9709	09/09/2016	PH –5th Percentile	Watching Brief*
GW9709	09/09/2016	PH –5th Percentile	Watching Brief*

OH1122(1)	15/12/2016		Standpipe damaged, unable to be sampled. Bore will be inspected to determine repairs required.
GW98MTCL2	01/06/2016	PH –5th Percentile	Watching Brief*
WOH2156A	04/03/2016	PH - 5th Percentile	Low pH is likely the result of coal seam depressurisation, as evidenced by falling water level. This trend is consistent with effects of nearby mining. No further action required.
WOH2156A	14/06/2016	PH - 5th Percentile	Low pH is likely the result of coal seam depressurisation, as evidenced by falling water level. This trend is consistent with effects of nearby mining. No further action required.
WOH2156A	16/09/2016	PH - 5th Percentile	pH stable; maintain watching brief.
WOH2156A	02/12/2016	PH - 5th Percentile	Low pH is likely the result of coal seam depressurisation, as evidenced by falling water level. This trend is consistent with effects of nearby mining. No further action required.
WOH2139A	16/06/2016	PH – 95th Percentile	Watching Brief*
WOH2139A	23/09/2016	PH – 95th Percentile	Watching Brief*
WOH2139A	02/12/2016	PH – 95th Percentile	Results are stable and consistent with historical trend. No further action required.
G3	03/03/2016	PH – 5th Percentile	Watching Brief. Large variance in Standing Water level indicates damage to the piezometer, currently under investigation.
G3	16/06/2016	PH – 5th Percentile	Investigation determined bore has partially collapsed to 65 m depth below ground. Bore will continue to be monitored and data assessed on a routine basis to identify if trend is deleterious.
G3	09/09/2016	PH – 5th Percentile	pH stable; maintain watching brief.
G3	15/12/2016	PH – 5th Percentile	Bore partially collapsed in early 2016 so data may not be representative of aquifer. Removal from monitoring programme has been recommended following review of data from nearby bores.

* = Watching brief established pending outcomes of subsequent monitoring events. No specific actions required.

Figure 59: Groundwater Monitoring Location Plan

4.0 BLAST MONITORING

MTW have a network of six blast monitoring units. These are located at nearby privately owned residences and function as regulatory compliance monitors.

The location of these monitors can be found in Figure 66.

4.1 Blast Monitoring Results

During December 2016, 28 blasts were initiated at MTW. Figure 60 to Figure 65 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 4.

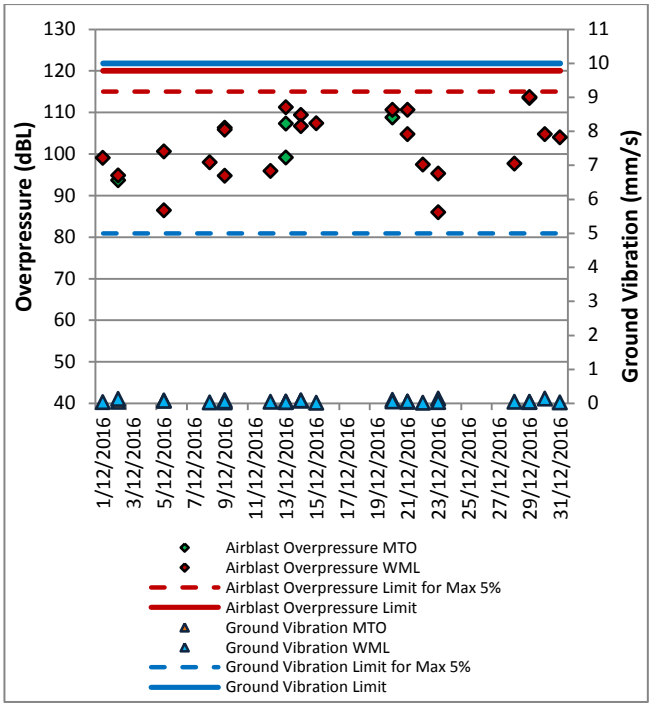


Figure 60:Abbey Green Blast Monitoring Results - December 2016

Table 4: Blasting Limits

Airblast Overpressure (dB(L))	Comments
115	5% of the total number of blasts in a 12 month period
120	0%
Ground Vibration (mm/s)	**Comments**
5	5% of the total number of blasts in a 12 month period
10	0%

During the reporting period no blasts exceeded the 115 dB(L) 5% threshold for airblast overpressure or 5mm/s 5% threshold for ground vibration

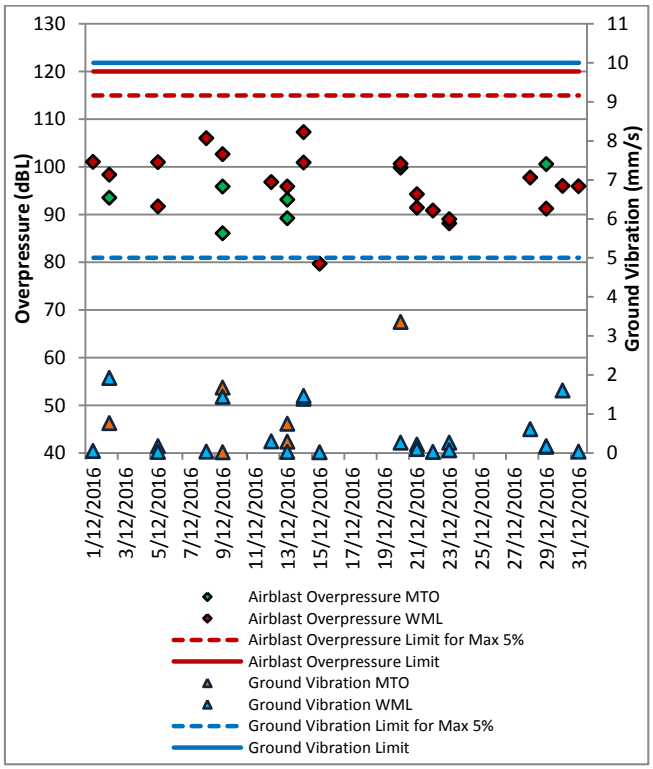


Figure 61: Bulga Village Blast Monitoring Results – December 2016

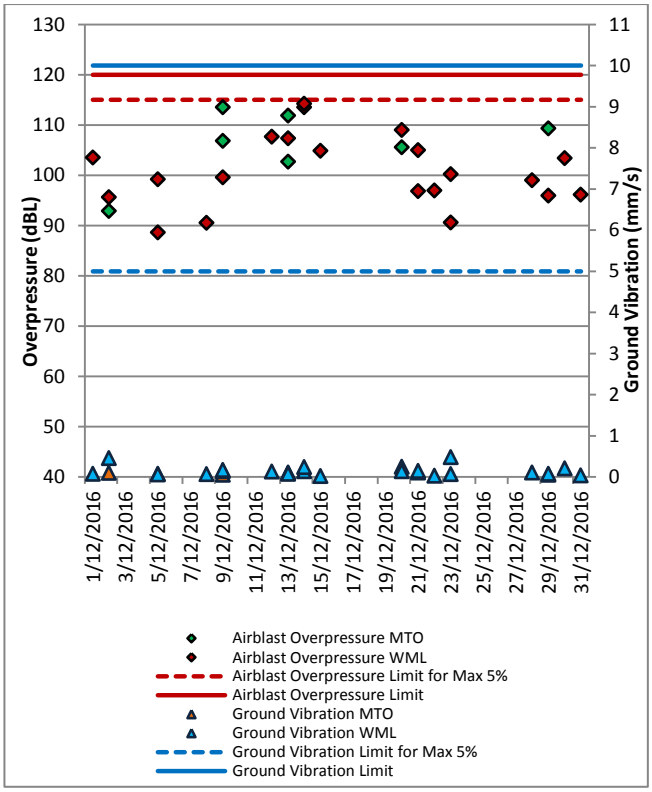


Figure 62: MTIE Blast Monitoring Results – December2016

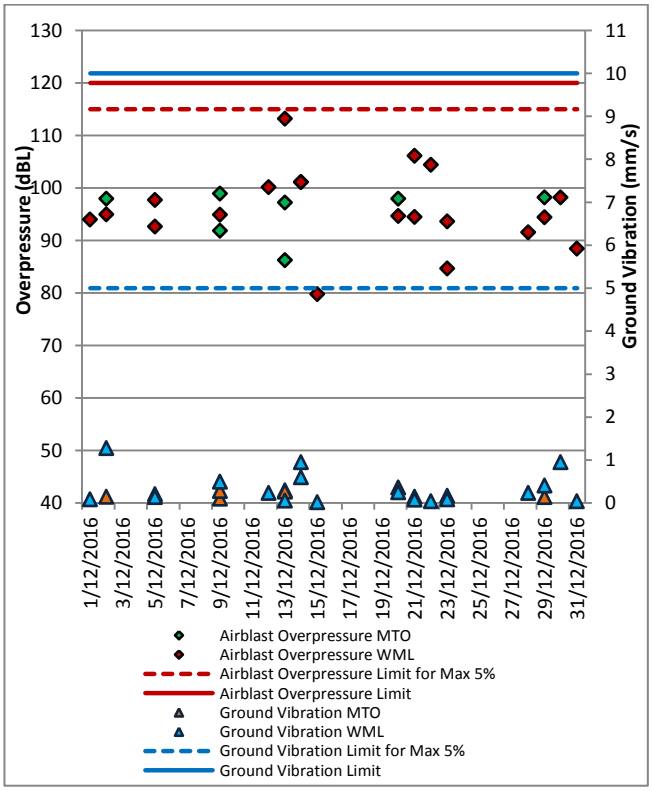


Figure 63: Warkworth Blast Monitoring Results - December 2016

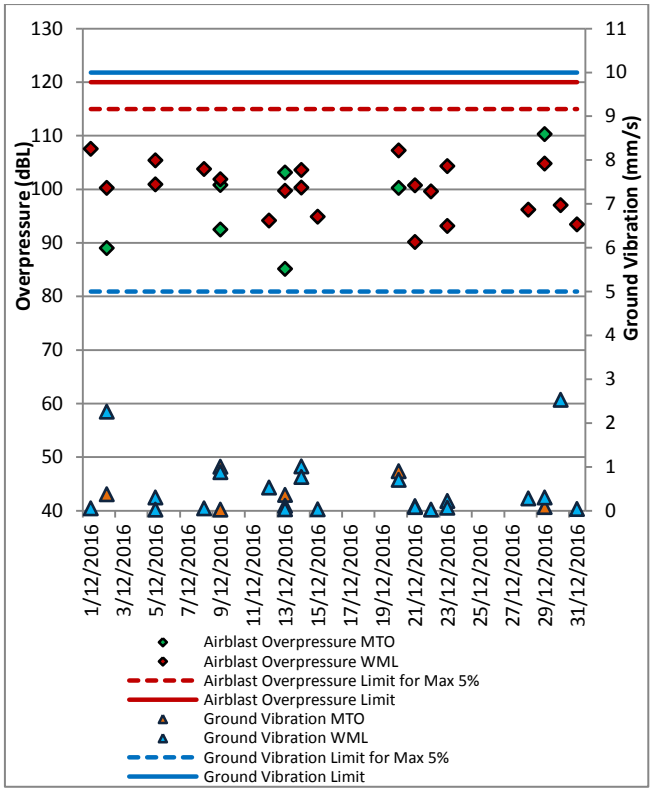


Figure 64: Wambo Road Blast Monitoring Results – December 2016

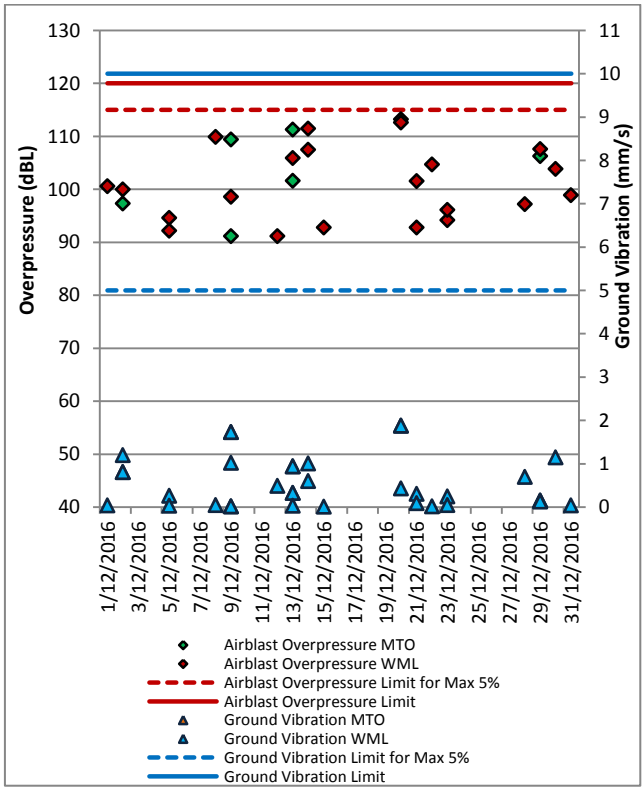


Figure 65: Wollemi Peak Road Road Blast Monitoring Results - December 2016

Figure 66: Blast and Vibration Monitoring Location Plan

5.0 NOISE

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan. A review against EIS predictions will be reported in the Annual Review. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Unattended monitoring (real time noise monitoring) also occurs at seven sites surrounding MTW. The attended noise monitoring locations are displayed in Figure 67.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 20 December 2016. All measurements complied with the relevant criteria. Results are detailed in Table 5 to Table 8.

5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in Tables 5 and 6.

Table 5: LAeq, 15 minute Warkworth Impact Assessment Criteria – December 2016

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion (dB(A))	Criterion Applies?[1,6]	WML L_{Aeq} dB[2,4]	Exceedance[3]	Total L_{Ceq} – L_{Aeq}	Revised WML L_{Aeq}[5,6]
Bulga RFS	20/12/2016 22:27	3.4	E	35	No	<25	NA	7	<25
Bulga Village	20/12/2016 21:00	3.9	D	38	No	24	NA	9	24
Gouldsville	20/12/2016 21:28	4.6	D	37	No	IA	NA	5	IA
Inlet Rd	20/12/2016 21:22	3.5	E	35	No	22	NA	5	22
Inlet Rd West	20/12/2016 21:44	4.6	D	35	No	IA	NA	1	IA
Long Point	20/12/2016 21:04	3.9	D	36	No	IA	NA	13	IA
South Bulga	20/12/2016 23:08	4.2	D	35	No	<25	NA	4	<25

Table 6: LAeq, 15 minute Warkworth - Land Acquisition Criteria – December 2016

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion (dB(A))	Criterion Applies?[1,6]	WML L_{Aeq} dB[2,4]	Exceedance[3]	Total L_{Ceq} – L_{Aeq}[7]	Revised WML L_{Aeq}[5,6]
Bulga RFS	20/12/2016 22:27	3.4	E	40	No	<25	NA	7	<25
Bulga Village	20/12/2016 21:00	3.9	D	43	No	24	NA	9	24
Gouldsville	20/12/2016 21:28	4.6	D	43	No	IA	NA	5	IA
Inlet Rd	20/12/2016 21:22	3.5	E	40	No	22	NA	5	22
Inlet Rd West	20/12/2016 21:44	4.6	D	40	No	IA	NA	1	IA
Long Point	20/12/2016 21:04	3.9	D	40	No	IA	NA	13	IA
South Bulga	20/12/2016 23:08	4.2	D	40	No	<25	NA	4	<25
Bulga RFS	20/12/2016 22:27	3.4	E	40	No	<25	NA	7	<25

Notes
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LA1,1minute attributed to Warkworth mine (WML);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

5.1.2 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in Tables **Error! Reference source not found.**7 and 8**.**

Table 7: LAeq, 15minute Mount Thorley - Impact Assessment Criteria – December 2016

Location	Date and Time	Wind Speed (m/s)[5]	VTG	Criterion dB	Criterion Applies?[1,6]	MTO L_{Aeq} dB[2,4]	Exceedance[3]	Total L_{Ceq} – L_{Aeq}[7]	Revised MTO L_{Aeq}[5,6]
Bulga RFS	20/12/2016 22:27	3.4	E	37	No	IA	NA	7	IA
Bulga Village	20/12/2016 21:00	3.9	D	38	No	IA	NA	9	IA
Gouldsville	20/12/2016 21:28	4.6	D	35	No	IA	NA	5	IA
Inlet Rd	20/12/2016 21:22	3.5	E	37	No	IA	NA	5	IA
Inlet Rd West	20/12/2016 21:44	4.6	D	35	No	IA	NA	1	IA
Long Point	20/12/2016 21:04	3.9	D	35	No	IA	NA	13	IA
South Bulga	20/12/2016 23:08	4.2	D	36	No	IA	NA	4	IA

Table 8: LA1, 1Minute Mount Thorley - Impact Assessment Criteria – December 2016

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	MTO $L_{A1,\ 1min}$ dB[2,4]	Exceedance[3]
Bulga RFS	20/12/2016 22:27	3.4	E	47	No	IA	NA
Bulga Village	20/12/2016 21:00	3.9	D	48	No	IA	NA
Gouldsville	20/12/2016 21:28	4.6	D	45	No	IA	NA
Inlet Rd	20/12/2016 21:22	3.5	E	47	No	IA	NA
Inlet Rd West	20/12/2016 21:44	4.6	D	45	No	IA	NA
Long Point	20/12/2016 21:04	3.9	D	45	No	IA	NA
South Bulga	20/12/2016 23:08	4.2	D	46	No	IA	NA

Notes
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LA1,1minute attributed to Mt Thorley Operations (MTO);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values

5.1.3 INP Low Frequency Assessment

In accordance with the requirements of the Industrial Noise Policy, the low frequency modification factor has been applied where appropriate. It should be noted that the Industrial Noise Policy does not give guidance on the application of the penalty where more than one target source is audible. The L_{Ceq} levels reported above are "Total", or "Total mine noise" at best, and cannot be attributed accurately to a single mine. Accordingly, where the INP criteria for the application of the Low Frequency penalty is triggered, the penalty has been applied to the dominant mine noise source (either of WML or MTO). There were no exceedances of noise criteria following application of the INP Low Frequency modification factor during December 2016.

Figure 67: Noise Monitoring Location Plan

5.2 Noise Management Measures

A program of targeted supplementary attended noise monitoring is in place at MTW, supported by the real-time directional monitoring network and ensuring the highest level of noise management is maintained. The supplementary program is undertaken by MTW personnel and involves:

- Routine inspections from both inside and outside the mine boundary;
- Routine and as-required handheld noise assessments (undertaken in response to noise alarm and/or community complaint), comparing measured levels against consent noise limits; and
- Validation monitoring following operational modifications to assess the adequacy of the modifications.

Where a noise assessment identifies noise emissions which are exceeding the relevant noise limit(s) for any particular residence, modifications will be made so as to ensure that the noise event is resolved within 75 minutes of identification. The actions taken are commensurate with the nature and severity of the noise event, but can include:

- Replacement of non-attenuated equipment with sound attenuated equipment;
- Changing the haul route to a less noise sensitive haul;
- Changing dump locations (in-pit or less exposed dump option)
- Reducing equipment numbers;
- Shut down of task; or
- Site shut down.
- A summary of these assessments undertaken during December are provided in Table 9.

Table 9: Supplementary Attended Noise Monitoring Data –December 2016

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
477	2	1	0.42

Note: Measurements are taken under all meteorological conditions, including conditions under which the consent noise criteria do not apply.

6.0 OPERATIONAL DOWNTIME

During December a total of 716.3 hours of equipment downtime was logged in response to environmental events such as dust, noise and elevated wind impacts. Operational downtime by equipment type is shown in Figure 68.

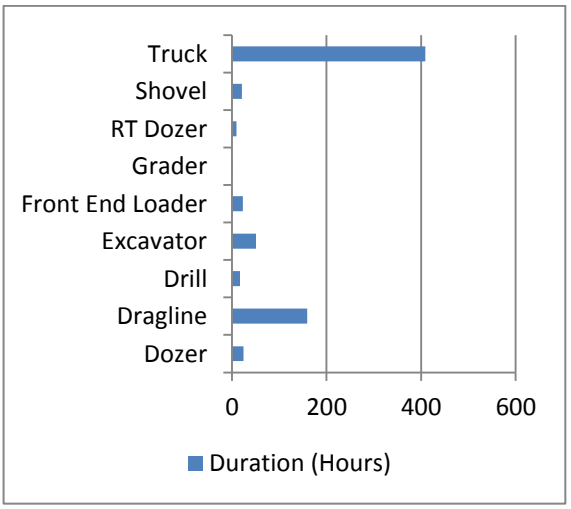


Figure 68: Operational Downtime by Equipment Type – December 2016

7.0 REHABILITATION

During December, 16.52 Ha of land was released, 8.86Ha was bulk shaped, 10.77Ha was topsoiled, 2.02Ha was composted and 19.08Ha was rehabilitated. Year-to-date progress can be viewed in Figure 69.

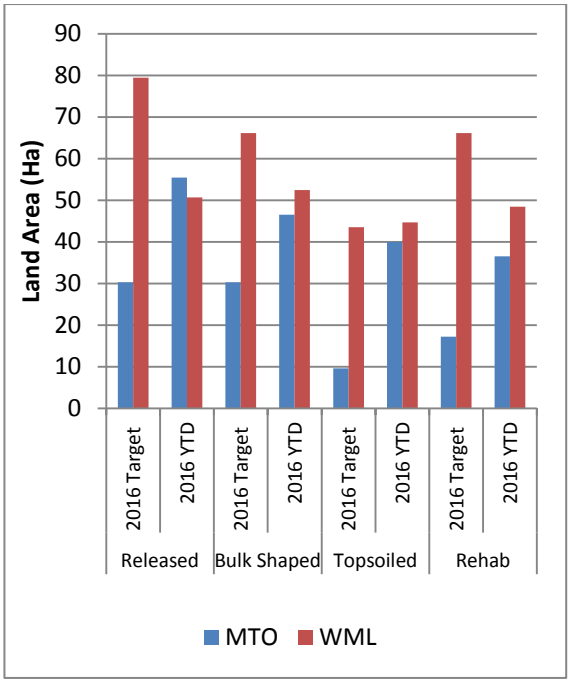


Figure 69: Rehabilitation YTD - December 2016

8.0 ENVIRONMENTAL INCIDENTS

During the reporting period MTW recorded one reportable environmental incident.

At 11:15am on the 2 December 2016 a blast identified as N35-GMB-PR7 was fired in the North Pit of the Warkworth Mine (WML).

Visible fume was generated by the blast which was ranked as a Level 3 event on the AEISG scale.

Following blast initiation, the blast plume migrated to the west, passing first through a closed section of Wallaby Scrub Road and travelled across lands owned by Mount Thorley Warkworth (MTW) toward the Putty Road. The plume left the MTW premises, crossing the Putty Road and Wollombi Brook at elevation, and dissipated on lands owned by MTW to the east of the Putty Road.

The incident was reported to the Department of Planning and Environment (DP&E) and Environment Protection Authority (EPA) on the 2nd December 2016. An incident report was submitted to DP&E and to the EPA on 9th December 2016.

9.0 COMPLAINTS

During the reporting period 14 complaints were received, details of these complaints are displayed in Figure 70 below.

	Noise	Dust	Blast	Lighting	Other	Total
January	30	1	5	2	1	39
February	24	2	6	1	0	33
March	43	1	2	1	0	47
April	64	7	4	0	5	80
May	17	5	7	1	0	30
June	18	1	5	6	0	30
July	15	1	5	0	10	31
August	47	3	10	1	1	62
September	25	2	6	0	2	35
October	22	6	7	1	0	36
November	13	7	3	2	1	26
December	6	2	5	1	0	14
Total	324	38	65	16	20	463

Figure 70: Complaints Summary - YTD December 2016

Appendix A: Meteorological Data

Table 10: Meteorological Data – Charlton Ridge Meteorological Station – December 2016

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Solar Radiation Maximum (W/Sq. M)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/12/2016	33.7	13.7	82.1	20.03	1225	176.6	2.9	0.2
2/12/2016	38.5	14.0	79.18	11.06	1272	217.3	2.9	0
3/12/2016	30.2	19.1	79.32	29.8	1457	130.1	3.1	0
4/12/2016	34.2	16.6	82.7	29.84	1176	147.2	2.1	0
5/12/2016	41.1	19.6	85.5	17.67	1343	162.1	2.7	3.4
6/12/2016	31.1	18.8	95.5	47.94	1356	143.3	2.3	6.8
7/12/2016	27.9	16.1	96.1	44.76	1520	125.6	2.0	2.8
8/12/2016	35.0	15.1	92.7	34.64	1226	206.9	2.8	0
9/12/2016	28.6	15.8	72.95	11.85	1193	221	4.2	0
10/12/2016	29.0	13.6	81	23.63	1285	124.2	2.6	0
11/12/2016	31.4	13.5	85	31.13	1202	150.2	2.8	5.2
12/12/2016	33.9	15.9	87.7	27.68	1149	158.7	2.1	0
13/12/2016	37.5	16.9	78	15.72	1210	284.9	3.6	0
14/12/2016	39.3	22.6	60.06	10.88	1257	268.1	4.3	0
15/12/2016	24.2	14.4	96.4	58.67	374.1	149.6	2.8	17.8
16/12/2016	23.2	14.1	97.8	75.33	1337	175.3	1.9	23.8
17/12/2016	33.4	17.9	95.7	26.19	1408	248.1	3.4	0
18/12/2016	25.7	16.3	73.68	37.81	1387	133.5	4.0	0
19/12/2016	27.1	14.2	82.3	34.93	1390	124.8	2.8	0
20/12/2016	34.5	11.9	87	28.07	1237	250.9	3.5	0
21/12/2016	36.5	18.6	73.15	13.94	1158	176.5	3.1	0
22/12/2016	26.1	16.9	83.6	48.79	1449	122.5	3.4	0.4
23/12/2016	31.0	15.8	78.95	36.79	1181	134.5	2.8	0
24/12/2016	33.2	16.4	93.1	33.45	1364	193.3	2.4	4.2
25/12/2016	31.6	15.1	94.6	33.45	1336	144.4	2.1	0.2
26/12/2016	35.5	16.2	90.6	24.9	1129	145.9	2.4	0
27/12/2016	36.6	18.2	81.4	24.97	1193	170.3	2.4	0
28/12/2016	37.3	17.4	84.5	21.3	1184	140.7	2.3	0
29/12/2016	40.5	19.6	74.05	11.23	1109	220.8	3.3	0
30/12/2016	42.3	21.8	54.25	11.98	1264	207.6	2.9	0
31/12/2016	41.5	22.5	74.95	17.42	1362	170.5	2.7	0.4

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Appendix D

Acquisition Update - Mount Thorley Warkworth Property Portfolio

Mount Thorley Warkworth property portfolio update

December 2016

Current property portfolio

1909 Putty Road, Bulga
1870 Putty Road, Bulga
1758 Putty Road, Bulga
1804 Putty Road, Bulga
1855 Putty Road, Bulga
1893 Putty Road, Bulga
1906 Putty Road, Bulga
1951 Putty Road, Bulga
2119 Putty Road, Bulga
2042 Putty Road, Bulga
1946 Putty Road, Bulga
1946 Putty Road, Bulga
608 Hambledon Hill Road, Singleton
271 Wallaby Scrub Road, Bulga
277 Wallaby Scrub Road, Bulga
896 Putty Road, Mt Thorley
288 Jerrys Plains Road, Singleton
11 Inlet Road , Bulga
36 Inlet Road, Bulga
1 Wambo Road, Bulga
89 Wambo Road , Bulga
910 Putty Road, Mt Thorley
129 Wambo Road, Bulga
181 Wambo Road, Bulga
313 Wambo Road, Bulga
317 Wambo Road, Bulga
248 Wambo Road, Bulga
367 Wambo Road, Bulga