

Mount Thorley Warkworth

2016 Annual Environmental Review - Addendum

In response to request for additional information by DPE

June 2017

The Mount Thorley Warkworth Annual Environmental Review was submitted on 31st March 2017. Department of Planning and Environment (DPE) have requested that additional information be included in the report (refer to Figures A and B).

The addendum has been prepared in response to DPE's request and should be read in conjunction with the main Annual Environment Review.

Andrew Speechly
Manager Environment and Community (HVO/MTW)
Rio Tinto
PO Box 315
Singleton NSW 2330

**Hunter Valley Coal Operations – SSD-6464 and SSD-6465
Annual Review 2016**

Dear Andrew

Reference is made to the Annual Review for the period 1 January 2016 to 31 December 2016, submitted to the Department 27 March 2017 of Planning and Environment (the Department) as required under Schedule 5, Condition 4 of SSD-6464 and Schedule 5, Condition 4 of SSD-6465.

The Department has reviewed the Annual Review and considers further information is required to satisfy the requirements of the Approvals. In accordance with Schedule 2, Condition 4 of SSD-6464 and SSD-6465, please amend the Annual Review and resubmit (preferably via email: compliance@planning.nsw.gov.au) to the Department with the following additional information by **9 June 2017**:

- a) **Map Showing Key Project Aspects** – Figure 1 in section 2.1 of the Annual Review includes a map showing the development consent boundaries for the project but doesn't include all the detail required in Section 2 of *Annual Review Guideline – Post-approval requirements for State significant mining developments*, Department of Planning and Environment (DPE, 2015). Please amend the map to include:
 - o Regional context
 - o Mining lease boundaries.
 - o Current operational disturbance footprint; and
 - o Offset areas.
- b) **Noise Compliance** – Noise performance is described in section 6.2 of the Annual Review however it is difficult to determine compliance with Schedule 3, Conditions 1 to 7 of SSD-6464 and Schedule 3, Conditions 1 to 5 of SSD-6465. Please revise section 6.2 of the Annual Review so that noise compliance can readily be determined.
- c) **Rehabilitation** – Please include a figure to address the requirements of section 8, dot point 1 of DPE (2015).

Please also identify planned post-mined land uses on the figures.

Significant soil chemistry limitations are identified in the soil testing results in Appendix 6 of *Native Vegetation Rehabilitation Monitoring 2017 – Mount Thorley Warkworth and Hunter Valley Operations Niche 2017* however this is not discussed in the Annual Review. Please include a discussion on key limiting factors to successful rehabilitation.

Figure A: Request Letter Page 1

The Department notes the positive outcomes from the grazing trial undertaken on site. Animal stocking rates and weight gain are useful indicators of the agricultural potential of the rehabilitated land however it needs to be considered against what inputs are necessary to achieve that performance and the ability of the rehabilitated soils to sustain that rate of agricultural production.

Please provide a discussion on the inputs and management regimes that existed on both the unmined and rehabilitated areas prior to undertaking the grazing trials and the ability of the rehabilitation soils to sustain grazing at the suggested stocking rates without degradation.

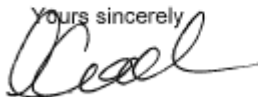
- d) **Sediment Dam Incident** – Section 11.1 of the Annual Review describes a sediment dam failure due to piping through the dam wall. Remediation works included:
- o Recovery of sediment;
 - o Excavation of the dam below ground level;
 - o Installation of an engineered spillway; and
 - o Undertaking a risk assessment for similar dams at Mount Thorley Warkworth to ensure appropriate management controls are in place.

Piping or tunnel erosion can occur in unconsolidated soils, dispersive soils or magnesian soils. The Annual Review and the incident report provided to the EPA and the Department fails to identify the reason for the piping. Please identify what physical and chemical properties resulted in the piping and given the presence of sandy soils, dispersive soils and magnesian soils across the project, what measures have been implemented to mitigate this risk on other sediment dams.

- e) **Independent Environmental Audits** – Section 10 of the Annual Review provides a brief description of the independent environmental audit undertaken in January 2016 but does not identify the key issues identified in the audit and progress with implementation of the Action Plan. Please amend section 10 to include a description of the key issues identified in the audit and progress with implementation of the Action Plan, as at the 31 December 2016.
- f) **Activities for completion next reporting period** – Section 12 of the Annual Review describes what environmental and community performance improvements will be completed next reporting period but does not include a timeline for implementation. Please amend section 12 to include an implementation timeline.

Should you need to discuss the above, please contact Michael Frankcombe as per the details provided above.

Yours sincerely

 8/5/17

Leah Cook
Team Leader - Compliance
As Nominee of the Secretary

Figure B: Request Letter Page 2

a) Map Showing Key Project Aspects

Figure 1 in section 2.2 of the Annual Review includes a map showing the development consent boundaries for the project but doesn't include all the detail required in Section 2 of Annual Review Guidelines – Post-approval requirements for State significant mining developments, Department of Planning and Environment (DPE, 2015) Please amend the map to include:

- *Regional context*
- *Mining lease boundaries*
- *Current operational disturbance footprint; and*
- *Offset areas.*

Figure 1 shows the development consent boundaries, mining tenement boundaries, the offsets for MTW, as well as where MTW sits relative to its near neighbours and neighbouring mine sites. Figure 2 shows the broader regional geographic context of MTW and the Offset Areas. Figure 3 shows the current operational disturbance footprint included as Appendix 4 in the submitted 2016 MTW Annual Review.

Mount Thorley Warkworth Key Project Aspects

Date: 170605
Plan By: DW
Version: 1.0

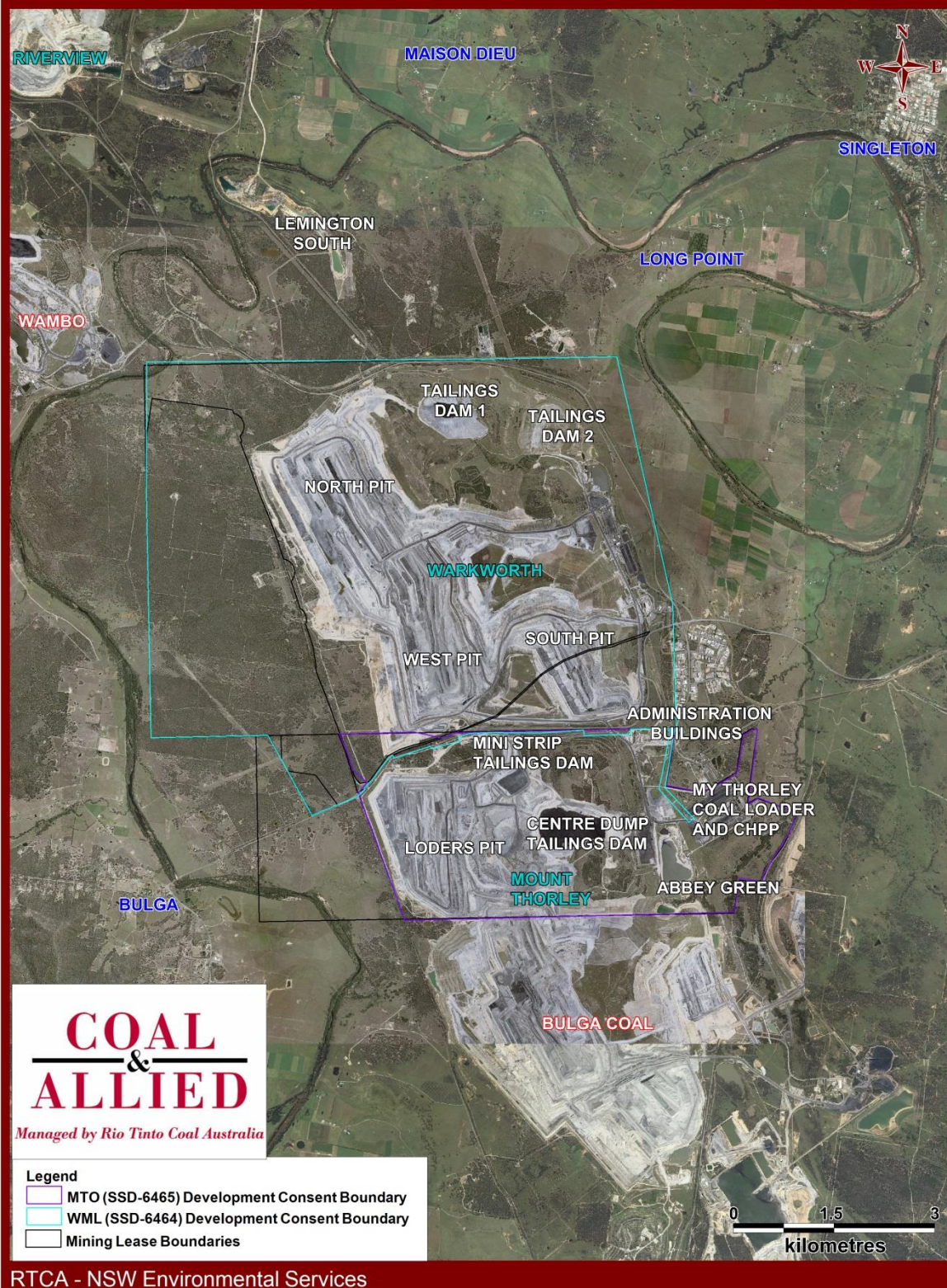


Figure 1: MTW Overview

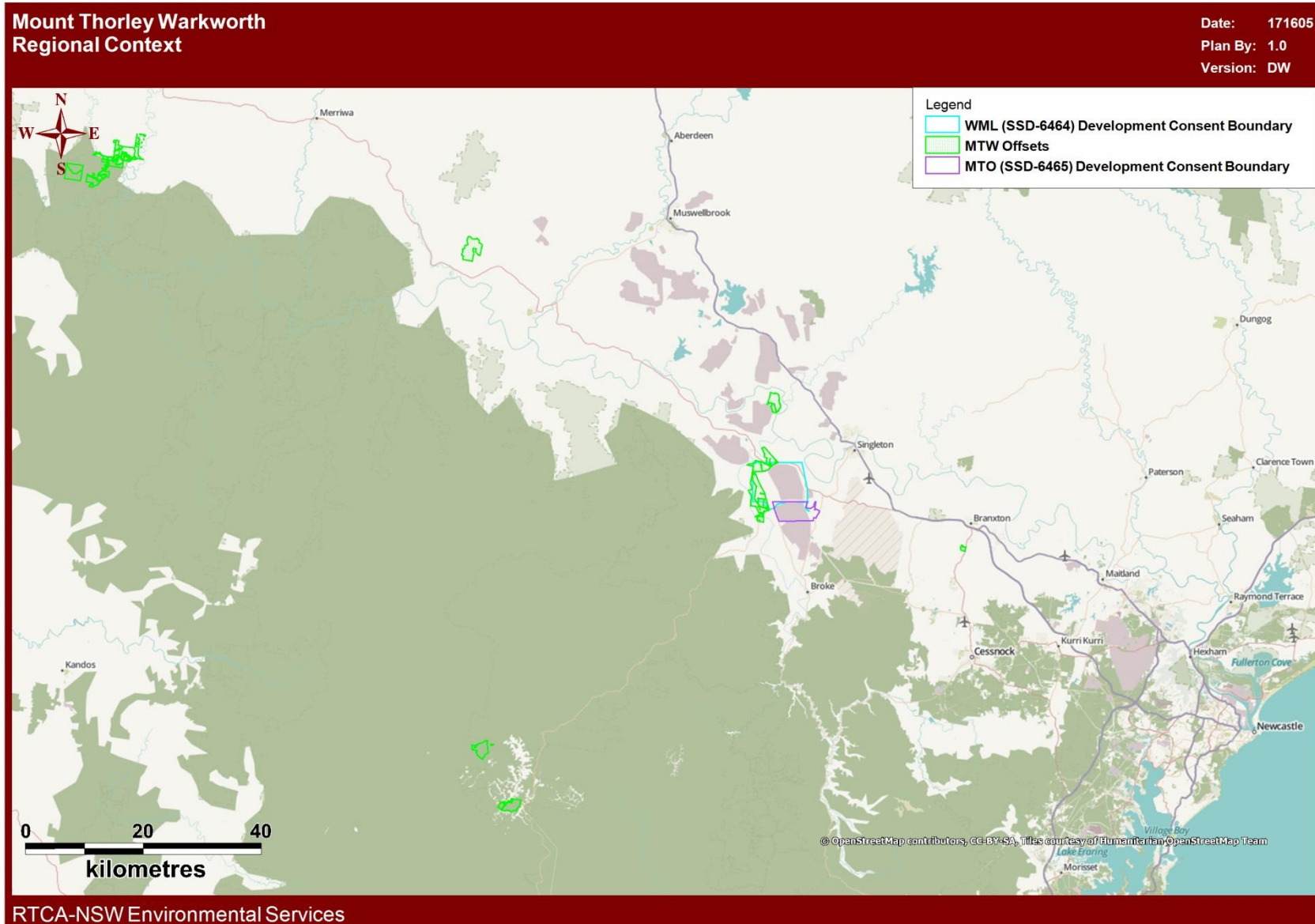


Figure 2: Regional Context



b) Noise Compliance

Noise performance is described in section 6.2 of the Annual Review however it is difficult to determine compliance with Schedule 3, Conditions 1 to 7 of SSD-6464 and Schedule 3, Conditions 1 to 5 of SSD-6465. Please revise section 6.2 of the Annual Review so that noise compliance can readily be determined.

There were no non-compliances recorded against MTW's consented noise conditions. Acquisition and additional mitigation upon request were carried out in 2016 in accordance with development consent conditions.

c) Rehabilitation

Please include a figure address the requirements of section 8, dot point 1 of DPE (2015).

Please also identify planned post-mined land uses on the figures.

Significant soil chemistry limitations are identified in the soil testing results in Appendix 6 of Native Vegetation Rehabilitation Monitoring 2017 – Mount Thorley Warkworth and Hunter Valley Operations Niche 2017 however this is not discussed in the Annual Review. Please include a discussion on key limiting factors to successful rehabilitation.

The Department notes the positive outcomes from the grazing trial undertaken on site. Animal stocking rates and weight gain are useful indicators of the agricultural potential of the rehabilitated land however it needs to be considered against what inputs are necessary to achieve that performance and the ability of the rehabilitated soils to sustain the rate of agricultural production.

Please provide a discussion on the inputs and management regimes that existed on both the unmined and rehabilitated areas prior to undertaking the grazing trials and the ability of the rehabilitation soils to sustain grazing at the suggested stocking rates without degradation.

Figure 3 shows the extent of mining and rehabilitation activities, surface contours and rehabilitation types. The figures also identify planned post mined land uses.

Key Limiting Factors to Successful Rehabilitation

The key limiting factors to successful rehabilitation will be discussed separately below for the two main types of rehabilitation being undertaken at MTW.

Native Vegetation Rehabilitation

Since 2011, Coal & Allied has increased its focus at both HVO and MTW on re-establishing a diverse native understorey within native vegetation rehabilitation. Experience over this period has shown that weed competition, which includes exotic grasses in the context of native vegetation establishment, is the main limiting factor to the successful establishment of a native understorey. The weed seed source is coming from both historically disturbed areas that are being stripped ahead of mining; and from the cover species on topsoil stockpiles.

Coal & Allied has implemented a range of programs to minimise the impact of weeds in rehabilitation, including:

- Prioritising the use of topsoils from good quality native vegetation areas on rehab that is being returned to native vegetation;

- Managing new and old topsoil stockpiles to clean up exotic grass/weed cover and establish a cover of native vegetation;
- Use of spoils and subsoils ameliorated with compost and gypsum as the growth medium for areas being returned to native vegetation. This method avoids the use of “weedy” topsoils and allows native vegetation to become established in the absence of competitive weed species;
- Use of a staged approach to rehabilitation where early sowing of sacrificial cover crops provide opportunities for weed control prior to sowing the native seed mixes;
- Use of a weed wiper and spot spraying to target exotic grasses and weeds in areas that have already been sown with native seed mixes.

The soil testing that has been undertaken during rehabilitation monitoring, and presented in Appendix 5 of the 2016 Annual Environmental Review, would indicate that many of the rehabilitation sites have soil limitations when viewed in the context of agricultural soil requirements. Most of the rehabilitation to be undertaken at MTW in the future is aimed at re-establishing native vegetation communities so the soil limitations need to be assessed with regards to native vegetation establishment rather than agricultural outcomes. The soil property requirements for successful establishment of native vegetation are less well understood than the extensively studied requirements for agricultural crops. Coal & Allied is therefore using the results from monitoring of both native vegetation rehabilitation and analogue sites to determine what the trigger levels need to be to initiate action to address soil limitations.

Rehabilitation sites where ameliorated spoil has been used as a growth medium provide a good illustration where native vegetation has been successfully established, in spite of soil properties (post-amelioration) that would traditionally be regarded as having significant limitations. There are, however, ameliorated spoil sites where the germination &/or survival of native plants has been poor and these sites tend to have soil properties that would place them at the more hostile end of the range of soil properties within the ameliorated spoil sites.

Table 1: Soil Property Information

Site Name	pH (1:5 water)	Electrical Conductivity (dS/m)	Organic Carbon (%)	Cation Exchange Capacity (cmol+/kg)	Sodium – ESP (%)	Calcium/ Magnesium Ratio
Analogue Site Range	5.42 – 6.69	0.05 – 0.10	3.43 – 9.44	7.44 – 20.44	1.16 – 5.54	0.65 – 2.14
HVOWES201101 (Good veg establishment)	8.44	0.16	5.64	20.09	2.05	1.48
MTWCDD210501 (Good veg establishment)	8.81	0.19	5.25	13.02	6.13	1.82
MTWTD1201501 (Poor veg establishment)	9.19	0.80	10.94	19.61	36.74	1.14

A summary of soil property information for a selection of ameliorated spoil rehabilitation sites is presented in the table above, including information on ranges obtained from analogue sites. It can be seen that all three rehabilitation sites have soil properties that fall outside the range of desirable soil properties and outside the range of results recorded from the analogue sites i.e. pH and EC. However, the native plants are adaptable enough to have been able to establish successfully in two of the three sites. Site MTWTD1201501 which has had poor vegetation establishment has soil properties that would be regarded as the most hostile of the three rehabilitation sites, in particular the soils are strongly alkaline, sodic and have higher salinity levels.

The standard ameliorant treatments being applied to the spoil rehabilitation sites (i.e. addition of compost and gypsum) are aimed at addressing the typical soil limitations of spoil as a growth medium. These ameliorants work to: 1) buffer soil pH; 2) address major cation imbalances (spoils are typically high in sodium and magnesium) through addition of calcium; and 3) improve soil structure to assist with leaching of salts through the profile. Observations of successful vegetation establishment would indicate that the standard ameliorant application is proving to be effective in many ameliorated spoil areas. However, ongoing analysis of vegetation establishment and soil test results will assist with determining trigger levels at which additional inputs are needed to address limitations in particularly hostile spoils.

Pasture Rehabilitation

Coal & Allied has been trialling the use of native grass species in pasture rehabilitation. Where native grass species are being used the limiting factor is weed competition; this is discussed in the section above. In pasture rehabilitation, where exotic pasture species are being used, the desired pasture species are less susceptible to weed competition. The main limiting factor for rehabilitation success in exotic pastures is a lack of diversity which can lead to declining feed quality during the winter periods.

The diversity of exotic pastures in rehabilitation are initially high due to the range of grass and legume species in the seed mixes. However, in the absence of the introduction and management of grazing these sites can become dominated by competitive summer growing species (i.e. Rhodes Grass and Green Panic). During winter these long rank grasses have poor feed quality and tend to shade out the winter growing legumes that would provide good quality feed over this period.

Therefore, to maintain pasture diversity and quality, implementation of grazing management to pasture rehabilitation areas in a timely manner is necessary. Where operational restrictions prevent the introduction of grazing other techniques, such as slashing, can be used to replicate the effect of grazing. Coal & Allied has been expanding the areas of pasture rehabilitation at HVO that are exposed to grazing through licence agreements over the last couple of years and this is planned to continue.

Rehabilitation activities that will be undertaken in the next reporting period

There is 122ha of new rehabilitation planned to be completed during 2017 at MTW. Coal & Allied have had success in recent years in achieving large rehabilitation targets by planning to carry over areas of dump release and bulk shaping into the following year. This makes areas available for rehabilitation early in the year and tends to smooth out the workload for the specialised rehabilitation contractors. At the end of 2017, MTW plans to have approximately 30 ha of dump areas released (20ha of which is planned to be bulk shaped) for rehabilitation in 2018.

There is 122ha of new rehabilitation planned to be completed during 2017 at MTW. Rehabilitation areas that will be completed during 2017 include:

- South Pit South and South Pit North areas that are visible from the Golden highway and Putty Road;
- North Pit North areas visible from the Golden Highway; and
- Bulga Boundary areas.

In addition to the new rehabilitation areas, Stage 2 rehabilitation will be conducted across areas of MTW as detailed in Section 12.6 Rehabilitation Maintenance of the MTW Annual Environmental Review.

Grazing trial discussion

Local graziers had maintained livestock grazing enterprises on the HVO analogue site under licence agreements until the grazing trial commenced in September 2014. The HVO rehab site has also been used

for grazing under licence agreement since 1999. Both the rehab and analogue sites would have had similar grazing management practices, in the form of long rotation grazing.

Information about historical fertiliser application is not available for the HVO Analogue site prior to commencement of the grazing trial. The HVO Rehab site was last fertilised by Coal & Allied in 2011; 125kg/ha of Di-ammonium Phosphate (DAP) was applied. In comparison to fertiliser regimes that would be recommended through nutrient budgeting, both sites have therefore been subject to low rates of fertiliser application in the period prior to the trial period.

Results of soil testing undertaken at the start of the grazing trial are shown in Table 4. the results indicate that the rehabilitation site had higher phosphorous and sulphur levels to the analogue site. These two nutrients are typically lacking in Hunter Valley agricultural soils without a regular fertiliser application regime. It was decided by the DPI researchers that no fertiliser would be added to either of the sites during the trial period. This decision was taken to avoid confounding factors associated with the varying response to fertiliser application of different pasture types.

Table 2: Grazing Trial Soil Analysis

Trial Site	2014		2016	
	Phosphorous Colwell (ppm)	Sulphur KCL40 (ppm)	Phosphorous Colwell (ppm)	Sulphur KCL40 (ppm)
HVO Analogue	6	4.8	5	3.6
HVO Rehab	31.5	6.2	27	6.1

Stocking rates for the first lot of steers on the grazing trial were the same on both the rehabilitation and analogue sites, at one steer per four hectares. Based on observations of higher feed availability in the rehabilitation paddocks the stocking rates were increased to one steer per 2.7 hectares on the rehabilitation site when the second lot of steers were brought onto the trial. The stocking rates on the analogue site were maintained at one steer per four hectares as this appeared to be an appropriate stocking level for the analogue paddocks. The second phase of the trial will therefore allow the rehabilitation paddocks to be tested at higher stocking rates while still ensuring that adequate ground cover is present.

The NSW DPI publication titled Beef Stocking Rates and Farm Size – Hunter Region (June 2005) indicates that stocking rates for 350kg yearlings gaining 1kg/day on pastures with some clover would average one steer per 2.6 to 3.5 hectares. It also states that a regular (annual) fertiliser program could increase this stocking rate to approximately one steer per 1.3 hectare. The stocking rates being used in the second phase of the trial on the rehabilitation site are therefore consistent with the DPI guidelines for a site that is not receiving a regular application of fertiliser.

The results to date from the grazing trial have shown that steers on the rehabilitation site have been able to achieve healthy weight gains over the period of the trial, with low rates of fertiliser application prior to and no fertiliser application during the trial period. Stocking rates on the rehabilitation site are consistent with district averages for the type of pasture and grazing operation being used.

A fertiliser application regime is considered an important part of a grazing enterprise, to return nutrients to the soil that are being removed via the produce i.e. beef cattle. It is anticipated that the tropical pastures and legumes that make up the rehabilitation site would respond well to regular fertiliser applications and allow for stocking rates to be increased from the rates currently being used on the grazing trial, while still maintaining suitable vegetative cover levels. The testing of sustainable stocking rates on rehabilitation sites using a fertiliser application regime that is typical for the district could be the subject of future grazing trials.

The current ACARP funded grazing trial (C23053 *Study of Sustainability and Profitability of Grazing on Mine Rehabilitated Land in the Upper Hunter*) will be concluded during June 2017. The final report, to be produced by the DPI researchers, will be available for review by DP&E during 2017.

d) Sediment Dam Incident

Section 11.1 of the Annual Review describes a sediment dam failure due to piping through the dam wall. Remediation works included:

- *Recovery of sediment;*
- *Excavation of the dam below ground level;*
- *Installation of an engineered spillway; and*
- *Undertaking a risk assessment for similar dams at Mount Thorley Warkworth to ensure appropriate management controls are in place.*

Piping or tunnel erosion can occur in unconsolidated soils, dispersive soils or magnesian soils. The Annual Review and the incident report provided to the EPA and the Department fails to identify the reason for the piping. Please identify what physical and chemical properties resulted in the piping and given the presence of sandy soils, dispersive soils and magnesian soils across the project, what measures have been implemented to mitigate this risk on other sediment dams.

As identified in the Annual Review the investigation determined the most likely cause of dam wall failure was due to “piping” where water percolated through the dam wall entraining soil material, causing instability and slumping of the wall. An exact cause of the piping was not established. Geotechnical testing indicated that dam construction materials were slightly dispersive. To prevent any chance of further embankment deterioration the dam was excavated deeper so that storage capacity was achieved without water standing against the embankment.

Specific measures implemented to prevent a reoccurrence included the completion of a risk assessment prior to the design and construction of any new dam to ensure the level of engineering used is commensurate with the dam risk, and; the development of a Construction Guideline for Small Dams.

e) Independent Environmental Audits

Schedule 3 Conditions 4C requires the Annual Review to include non-compliance identified, including key outcomes from the Independent Environmental Audit and reporting on progress of closing out actions. Please amend section 10 of the Annual Review to include progress with implementation of the action Plan as at the 31 December 2016

Section 10 of the Annual Review provides a brief description of the independent environmental audit undertaken in January 2016 but does not identify the key issues identified in the audit and progress with implementation of the Action Plan. Please amend section 10 to include a description of the key issues identified in the audit and progress with implementation of the Action Plan, as at the 31 December 2016.

The table below shows the response to the non-compliances (issues) contained in the audit report:

Table 3: Responses to Issues from Independent Environmental Audit

Issues resulting in non-compliance	Response
Mount Thorley consents were not surrendered by the agreed date.	The surrender of these documents was delayed in 2013 as a result of legal proceedings in the Land and Environment Court relating to the (now disapproved) Warkworth Extension Project. Non-fulfilment of this obligation following the completion of these proceedings was an administrative oversight, which will be corrected via surrender of these instruments in 2016.
Ten noise exceedances recorded during the audit period.	<p>The noise non-compliances recorded in 2011, 2012 and 2013 were reported in accordance with the requirements of the relevant approvals.</p> <p>MTW's noise performance has since improved significantly (zero recorded instances of non-compliance since March 2013). The improved performance is attributed to several factors:</p> <ul style="list-style-type: none"> • Program of progressive introduction of sound attenuated equipment to the mining fleet; • Introduction of MTW's Community Response Officer role to support the real-time noise monitoring network; and • Clarification of noise management expectations through revision of the Noise Management Plan. <p>Ongoing improvements in Noise Management are captured and managed through revision of the MTW Noise Management Plan, in consultation with the Department. No further action is proposed at this time.</p>
Two Airblast overpressure exceedances during the audit period.	<p>Non-compliant measurements account for 0.01% of all recorded airblast overpressure data during the audit period (1,993 blast events - two non-compliant airblast overpressure results recorded from a total of 14,795 measurements). High level of compliance indicates current controls are effective.</p> <p>Ongoing improvements in Blasting Management are captured and managed through revision of the MTW Blast Management Plan, in consultation with DP&E. No further action is proposed at this time.</p>
Breaches of criteria for water flowing offsite during the audit period.	A programme is in place to mitigate against the risk of water flowing offsite, by: secondary containment and leak detection works on major pipelines, catchment modifications to divert clean water away from the mine and offsite and; dam maintenance initiatives.
No evidence of a process to ensure required reviews of Strategies, Plans and Programs required under DA's were conducted.	<p>It should be noted that all Plans, Strategies and Programs have been the subject of multiple reviews in consultation with DP&E as a result of consent modifications and ad-hoc interactions.</p> <p>MTW will make adjustment to Document Control processes to ensure Plans, Strategies and Programs are reviewed in accordance with the Condition(s).</p>
One blast was conducted outside allowable hours without written permission from DP&E.	One blast (from 1,993 blasts fired during the audit period) occurred outside the approved hours (recorded at 6:03 PM on 18 th November 2011). Blast cd17-www-e-md1 was delayed due to wet weather which resulted in cessation of loading. The decision to fire was taken to mitigate the risk of generation of blast fume and further degradation of the shot to an unsafe

Issues resulting in non-compliance	Response
	state if impacted by further (forecast) rain. DP&E were notified at 5:47pm when it was identified that the blast may not be fired within the approved hours. The event was reported as non-compliant at the time and subsequently followed-up by DP&E (then DoPI). No further instances of blasts occurring outside the permissible hours. No further action is proposed at this time.
The Warkworth Independent Environmental Audit from 2010 was not submitted within three months of it being commissioned.	Subsequent audit reports have been submitted to the Director-General within the prescribed time. The current audit will be submitted on or before the agreed date of 29 th February 2016. No further action is proposed at this time.
The predictive air quality system in place does not include a site-based model which takes account of planned operational activity.	<p>It should be noted that the obligation is derived from the 2013 Warkworth Environmental Assessment (Modification 6), which has since been superseded by the approval (and associated Environmental Impact Statement) of the Warkworth Continuation Project (SSD-6464).</p> <p>A predictive meteorological forecast tool is utilised on a daily basis to inform MTW personnel of instances of heightened air quality risk.</p> <p>Development Consent instruments issued in 2015 (Warkworth Continuation Project SSD-6464 and Mount Thorley Operations SSD-6465) require the following:</p> <p><i>“The Applicant shall:</i></p> <p><i>Operate a comprehensive air quality management system that uses a combination of predictive meteorological forecasting and real-time air quality monitoring data to guide the day to day planning of mining operations and the implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this consent”</i></p> <p>Ongoing improvements in Air Quality Management are captured and managed through revision of the MTW Air Quality Management Plan, in consultation with DP&E. No further action is proposed at this time.</p>
A visible dust plume was emitted from the site on four occasions during the audit period.	<p>The audit report identifies four events as evidence to support a finding of non-compliance, as follows:</p> <ul style="list-style-type: none"> • 12th January 2012 – blast plume associated with WML West Pit blast wp24-gmb-1p1; • 11th April 2012 – blast plume consisting of dust and fume associated with WML South Pit blast sp19-whe-pr1; • 13th May 2012 – wind borne dust emissions from WML associated with adverse conditions; and • 10th October 2012 – wind borne dust emissions from WML associated with adverse conditions. <p>MTW disputes the assessment of non-compliance with Condition O3.1 of EPL 1376 with respect to the events of 12th January 2012 and 11th April 2012. These events were the subject of regulatory inquiry (including submission of incident reports in accordance with condition R3 of EPL1376), however there was no further follow-up requested from the EPA</p>

Issues resulting in non-compliance	Response
	<p>in relation to either event following submission of incident reports. MTW does not consider that the submission of reports in relation to these events necessarily constitutes non-compliance with condition O3.1.</p> <p>Ongoing improvements in Air Quality Management are captured and managed through revision of the MTW Air Quality Management Plan, in consultation with DP&E. No further action is proposed at this time.</p>
Required dust monitoring measurements were not collected on all the required occasions during the audit period.	<p>MTW reports all instances of monitor malfunction or measurement capture failure in the relevant EPL Annual Return each year. While MTW strives to ensure that 100% of monitoring data capture requirements are met, it should be noted that monitor failures do occur from time to time. A number of improvements have been implemented in recent years to improve monitor reliability, including:</p> <ul style="list-style-type: none"> • Upgrade of aged monitor hardware; • Increased frequency of routine maintenance / inspection; and • Rationalisation of redundant monitoring locations <p>Ongoing improvements in Air Quality monitoring are captured and managed through revision of the MTW Air Quality Management Plan, in consultation with DP&E. No further action is proposed at this time.</p>
Some blast monitoring data was not recorded during the audit period.	<p>MTW reports all instances of blast monitor malfunction or measurement capture failure in the relevant EPL Annual Return each year. MTW has achieved 100% blast monitor capture in 2014 and 2015 following implementation of a number of improvements, including:</p> <ul style="list-style-type: none"> • Overhaul of the blast monitoring network, using a local supplier; • Increased oversight of daily data capture (internal process); and • Rationalisation of redundant monitoring locations <p>Ongoing improvements in Blast monitoring are captured and managed through revision of the MTW Blast Management Plan, in consultation with DP&E. No further action is proposed at this time.</p>
Not all of the mining fleet was acoustically attenuated by the end of 2015.	<p>At the time of the site inspection, MTW operates the following as sound attenuated units:</p> <p>Trucks - 65%, Dozers - 63%, Excavators - 75%, Drills - 38%</p> <p>The HME attenuation program is ongoing, and is planned for completion by the end of 2016 (in line with the requirements of new Planning Approvals).</p>
No studies are conducted to support decision making on vertebrate pest control.	<p>The Mount Thorley Warkworth Mining Operations Plan (MOP) will be updated to reflect current practice, which is to design the vertebrate pest management programs based on the results of previous programs and vertebrate pest sighting reports. The reference to “scientific” basis will be removed as the current practice provides a robust method for designing the vertebrate pest management programs.</p>
Volume of water extracted from pits not reported to DPI-Water annually.	<p>A section has been added to the 2015 Annual Review to report on compliance with conditions of Water Act 1912 Licences, with a copy of the report to be sent to DPI Water on an annual basis.</p>

Issues resulting in non-compliance	Response
Volume of groundwater inflow not measured directly as the source was a passive flow into the pit that could not be separated from rainfall and runoff.	As groundwater inflow is unable to be measured it has been modelled using the site water balance, with volumes reported in the Annual Review. Under Development Consent instruments issued in 2015 (SSD-6464, SSD-6465) an Annual Groundwater Impacts Report will be completed which will routinely model (based on actual monitoring data) groundwater inflows and compare these to those predicted. A copy of the report to be sent to DPI Water on an annual basis.
Predicted groundwater inflow was not compared with actual groundwater inflow in the Annual Environmental Reports (AEMR's).	Under Development Consent instruments issued in 2015 (SSD-6464, SSD-6465) an Annual Groundwater Impacts Report will be completed which will routinely model (based on actual monitoring data) groundwater inflows and compare these to those predicted. Comparisons of water quality against EA predictions are currently included in the Annual Review. A copy of the report to be sent to DPI Water on an annual basis.
The amount of groundwater taken from alluvials (if any) must be accounted for in the groundwater extraction volumes reported to DPI-Water.	Under Development Consent instruments issued in 2015 (SSD-6464, SSD-6465) an Annual Groundwater Impacts Report will be completed which will routinely model (based on actual monitoring data) groundwater inflows and compare these to those predicted. Comparisons of water quality against EA predictions are currently included in the Annual Review. A copy of the report to be sent to DPI Water on an annual basis.

As at 31st December 2016, all actions related to the audit were completed with the exception of:

- Facilitate surrender of 1981 and 1983 MTO Consent documents
- Revise MTW Mining Operations Plan to reflect current practice regarding design of vertebrate pest control programs and remove reference to scientific basis. The change has inconsequential significance. The due date for completion of this action is 31st July 2017.
- Ensure MTW 2016 Annual Groundwater Impacts report is completed and submitted to DPI Water. The due date for completion of this action is 31st March 2017.

The 1981 and 1983 MTO Consents were surrendered to DP&E on the 19th January 2017 however feedback from DP&E on 28th February indicated landholder consent was required. This is currently being sought from the relevant landholders and is expected to be completed by 31st July 2017.

f) Activities for completion next reporting period

Section 12 of the annual Review describes what environmental and community performance improvements will be completed next reporting period but does not include a timeline for implementation. Please amend section 12 to include an implementation timeline.

An implementation timeline has been prepared to illustrate completion schedule of activities outlined in section 12, see Figure 4 below. Activities which are scheduled to occur for the entirety of the year or are scheduled to be completed in the following year have been given an end date of 31st December 2017 for illustration purposes.

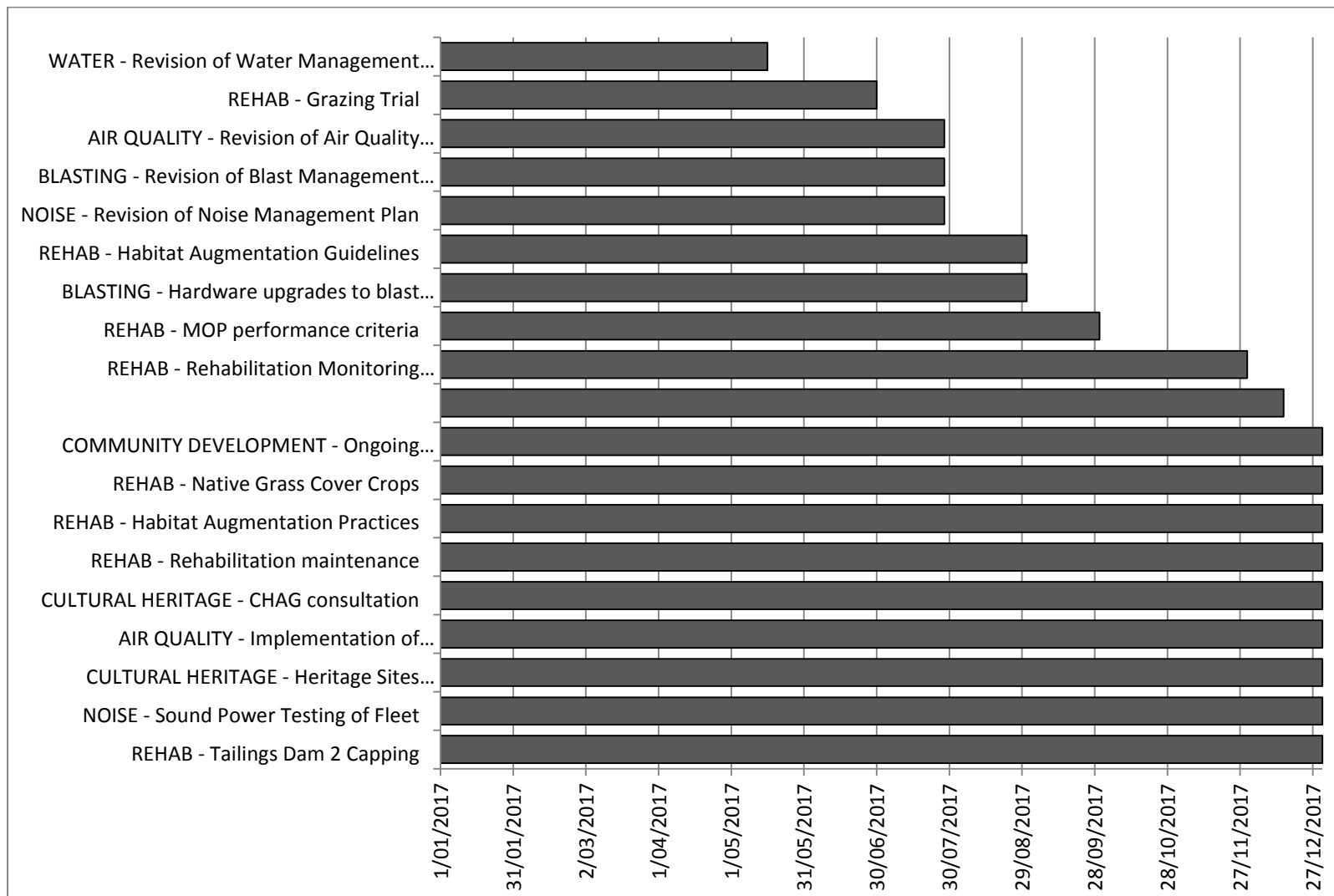


Figure 4: Implementation Timeline