

Narrabri Mine Community Consultative Committee Meeting Minutes

Meeting No:	32
Date:	Wednesday 16 th March 2016
Time:	4:00pm
Location:	Narrabri Mine Site Office
Present:	Russell Stewart (RS) – Independent Chairman
	James Stieger (JS)
	Rodney Dunlop (RD)
	Peter Webb (PW)
	Mark Foster (MF)
	Geoff Hunter (GH)
	Steve Bow (SB) – Narrabri Mine General Manager
	Dave Ellwood (DE) - Narrabri Mine Technical Services Superintendent
	Steve Farrar (SF) – Narrabri Mine Environmental Superintendent

1. APOLOGIES

Catherine Redding and Lexie Frankham

2. DECLARATION OF PECUNIARY OR OTHER INTERESTS

None.

3. PREVIOUS MINUTES

Moved: MF Seconded: JS

3.1. BUSINESS ARISING FROM PREVIOUS MINUTES

Property Values – JS asked if the mine had followed this up. SF said none with owner however, the Department of Planning and Environment (DP&E) were onsite today to talk about a few issues including this one.

Newgate Survey – GH said he had read the minutes from the last meeting and was happy with that. SF asked if he wanted to be taken off of the contact list but GH said he is happy to stay on it.

Noise Management Upgrades – SF said as part of our latest modification, approved December 2015, the mine committed to upgrading noise management including a 60m tower and some additional noise units. JS asked where the tower would be and SF replied on 'Claremont'. GH asked about noise issues onsite and have people complained. SF stated that we had an exceedance in monitoring last year but also was required by Modification 5 in relation to questions raised by the EPA in relation to the noise model. JS asked where the noise units would go. SF replied on our north and south boundaries and that the units would alarm to the CHPP. SF said if this doesn't satisfy some people then we could relocate another unit as well.



4. GENERAL BUSINESS

4.1. OPERATIONS PROGRESS REPORT

The operations update was provided as follows:

Mine Progress Report (to 29 February 2016)

Coal produced (t):	February 2016	560,232
	FY-to-date	5,006,404
Coal Railed (t):	February 2016	545,439
	FY-to-date	5,272,338
Average workforce n	umbers (February 2016):	
	NCO	Waged – 161
		Salary – 106
		Total – 267
	Contractors	Total – 96
Safety Update (FY to	February 2016):	
	Lost Time Injury (LTI)	3
	Days LTI Free:	11
	Total Recordable Injuries:	12
	Planned Task Observations:	5,379
	Take 5 Assessments:	78,830
	Work Hours (Feb-16):	91,556

SB stated that operations have been fairly steady with a few little hiccups in production. SB said the longwall would be relocated in May/June this year. SB also stated that employment has also been fairly steady. JS asked if the contractor numbers included the longwall change contractors to which SB replied no and that another 25 or so people would be onsite to help. JS asked if we were still cutting to which SB replied yes. JS asked why the pile was so low, SB replied due to roof fall issues, and that we are currently digging the longwall out. SB said it should finish 2nd half of April but still have a couple of weeks to go but it has slowed us down a bit. SB said that we would also be going through a power upgrade in the second half of the year by extending the powerline about 2km to the west and sending it underground by another borehole as the longwall is getting too far away. SB also said this would require around 20 more people for this work. JS asked if this is for Transgrid, SB said you do it with Essential Energy but two other companies are involved. SF said it is our line but another company and Essential Energy are involved. SB said apart from project management we don't do any work. SB said our safety performance is also fairly steady with some improvement on the previous year although it is incremental but we are still hurting some people. SB said the stockpile expansion should be completed in a couple of weeks' time. JS asked about the new 'stockpile'. SF said it is being removed from the dam and will go to the emplacement area. SB said we are increasing that dam and lining it. RS asked when we put the liners in are they similar to the Santos ones, SF replied it is big strips of HDPE plastic that is welded together so it would be similar. RS said they have to do 3 layers out there to which SF replied we don't have to. JS said the mine was only going to do clay lining to begin with. SB said it is based on saline levels and although the clay liner met specification, the goals change so now we are lining it. RD asked what the EC was and SB said about 9,000, SF said it captures all the water from the coal processing area. JS said

you have been in production for 7 years and there is some there [material in the dam] and SB said it surprised us as well. GH asked how many of the 390 people live in Narrabri, to which SF replied a third Narrabri, a third Gunnedah and a third elsewhere. RS said he would like to congratulate the mine on those numbers because that's not how they were. SB said there is a community newsletter that quotes some of these numbers and he would give GH a copy. RS asked if the newsletter is sent out. SB said he thinks it is on the website. RS said it is good to get the info from Whitehaven and not others.

WHITEHAVEN COAL

4.2. ENVIRONMENTAL OVERVIEW

The environmental monitoring report was provided to the CCC members and SF went through the report.

SF said additional noise monitoring was done in relation to a complaint with no compliance issues identified but the results are not in the report.

RD asked if the TSP picked up the deposited dust to which SF replied no the unit would have to operate on the day.

JS asked where P15 is? DE said in the middle of the longwall block. SF said you can see when we went through and developed and then came back and mined. SF said P15 and P14 are next to each other and P14 has never had any water.

JS asked if we are still measuring the first panel? SF said we have revised the Extraction Plan and the revision takes the monitoring out but this is not yet approved. JS asked if it is still moving. DE said we can get around 40-50mm of movement just in the soil without subsidence.

JS said it had been dusty lately. SF said the mine received a complaint one day and when reviewing the footage it was actually a 'whirly wind' but because there were dozers working there from afar it would have looked like the dozer making the dust.

GH asked the mine to explain why we have a bit more subsidence then what was predicted. SF said we got more than predicted but have since updated the data based on actual monitoring results. DE said longwall mining hadn't been done in the area before. SF said the predictions were based off the experience in the Hunter Valley. RD said it is a bit of a black art subsidence monitoring. JS said they thought that because of the hard rock above them that they may stay up. GH asked about 101 and 105 and the predictions are for 27 but we have measured 132 to which SF said those results relate to power poles. SF said they monitor the poles to see how they twist and move. DE said the poles have since been removed. JS said they would have clearance of 4.5m to which DE replied yes so instead of managing we have removed and if we need power after mining we would install new poles as it was an old line anyway. SF said that was an 11kV line that fed two properties the mine owns. SF also said one property was leased so a generator was located their but it is not leased anymore.

5. NEW BUSINESS

RS said that the EPA were opening an office in Narrabri. DE said he was aware. RS said it came about following a meeting with the EPA. RS said they wanted the EPA to commit to the town like the mines so they will have 3 people in the new office. RS said he thinks it's good. SF said he thinks the EPA will be responsible for Coal Seam Gas operations to which RS said they would. JS said also look after Council. JS said they will also look after pesticides and over spray. RS said they need to commit to the area and build relationships like industry has and they will be in the Government block.

RS said he sent an email to the Whitehaven CEO about the Whitehaven representatives on the committee about the good job that is done. RS said he was disappointed he had no feedback and asked if we had seen it. SB said he hadn't seen it. GH asked what the idea was behind that and that if it is from the group it should be sent around for comment. JS said it was sought of discussed at the last meeting. SF said it came up at the last meeting when the Council representative was talking about other committees and how they

work. GH said if it is on the committee's behalf then he would like a read. RS said he would be happy to provide a copy next time. RS stated that as chair of the CCC he can send emails that are not from the committee without the committee's input. RS said he would send GH a copy of the email. GH stated that if it is on behalf of him then he would be disappointed if it were sent without being read and as members of the committee he may have a different view. RS said that if it is sent on behalf of the CCC then he would absolutely see it.

RS stated that three contractors have gone belly up and have left a lot of local businesses in a bad spot. RS said they were not Whitehaven contractors. SB said the mine could withhold payment in certain circumstances and that has been done before. RS said that was excellent but in a lot of situations they won't and they are not talking with local businesses to keep them updated. RS said when he was in local Government you could get something as good as a bank guarantee letter from their financiers to say that they are right for X amount. RS asked how the mine puts contractors on. SB said when we engage we go through a financial health review given the current state of the industry and we had a drilling company go bust last year. DE said for the new drilling contract the mine through a due-diligence process to see if they could maintain their work base. SB said as part of that too the mine has started paying some local suppliers direct as we knew the contractor was in strife. SB said there was another situation where a company went bust and they owed money locally so the mine reduced payments to the contractor to pay the local business. SB said the only issue is people need to let the mine know because often you don't find out until after. JS said that would be good information to put in a newsletter. SB said the mine is sensitive to that with some local companies. RS said he was disappointed in the businesses that contracted the company. RS said if you signed a contract with a company that do work for a large company that they would do their due diligence. GH asked SB if he were contracted to the mine, there would be a chance that he would be more reliable otherwise, he wouldn't get signed up. SB said as part of the selection process you go through a financial health check and for a larger company your balance sheet would tell you all of that for example, but that is never a guarantee but the fundamentals look reasonable. SB said you don't get visibility as to their suppliers though, but legally you can hold money back and pay the subbie. RS said that he has seen a lot of farm workers get stung because you are not only blowing wages but also all of the stuff you have purchased to do the job. RS said he thought he would ask that question as he would be asking the new CO of Santos as well. JS said the mine could look at the balance sheet and then they subbie it out anyway. RS said it was disappointing to have three fold at once.

RS asked if the mine had been involved in the inland rail discussion. SB said not to date. RS said EOI closed last week for an intermodal terminal. RS said the State Government seems concerned about stuff going out of state. RS asked if the Council approached the mine as they did the EOI. SB said he wasn't involved but wasn't sure if the logistics people in Newcastle had been involved as they deal with ARTC. RS said he would have hoped that Council approached the mining industry.

GH asked about the RO plant that was mentioned in the previous minutes. SB said there is an RO upgrade. SB said the current plant is about 1 ML a day and going to about 2 ML a day. SB said as the mine progresses the water we pump out increases slightly with a peak of about 3-3.5 ML/day but it is saline and so we process it and we consume about 1.5 ML/day. SB said we are still importing water but at some point we will become exporters. RD asked about the discharge EC of the water and our EPA licence limit. SF said when we export to the river it is around 250mg/L for 50% with a max of 350mg/L, which is an EC of around 500. RD said it is from 9,000 to 500. SF said the feed it is about 8,000 and it comes out at about 600. GH asked what we do with the salt that we get out of it. SF said it goes into a lined dam. SB said the brine is in steady state with evaporation and we pump it back through our sprinklers for dust suppression. SF said we are lining another dam this year for storing brine. GH asked if they get runoff as well to which SF responded that the dams are 'turkey nest' dams and they are in the rail loop and flow into each other. SF said we maintain the levels in them and that all the water we spray on the stockpiles goes back to them as well. GH asked when the upgrade will occur, SB said we are currently going through the design and plan to upgrade in the next FY. JS said the licence allows you to put it back in the river with the cap the bores scheme, SF said it is still limited and we have to offset that. RD said that limit is pretty low and DE said it is better than the water in the river now. SF said we are required to investigate other options for use of that water which would likely mean selling to local farms.



6. NEXT MEETING

Wednesday 22nd June 2016 at 4:00pm. Narrabri Mine Site Office.

7. CLOSURE OF MEETING

Meeting closed at 5:00pm.



Narrabri Mine Community Consultative Committee Meeting #32

Environmental Monitoring Report December 2015 – February 2016

Noise Monitoring

Attended noise monitoring was undertaken between Tuesday 1st and Thursday 3rd December 2015 (Tables 1-12) to verify if noise levels were within compliance limits. The results from this monitoring are detailed in the tables below.

Table 1: NM Operational Noise Monitoring Results – 1 December 2015 (day)							
Location	Time	Total dB(A),	Wind speed/	Temp Grad	Identified Noise Sources		
		Leq (15 min)	direction	(°C/100m)			
R4 Oakleigh	10:20 am	44	6.0/322	n/a	Traffic (42), birds & insects (39), NM inaudible		
R13 Newhaven	12:09 pm	44	5.6/323	n/a	Birds & insects (37), NM (33*)		
R16 Belah Park	10:20 am	47	6.0/322	n/a	Birds & insects (44), wind (44), traffic (35), NM		
					inaudible		

*Noise from vent fan

Table 2: NM Operational Noise Monitoring Results – 1 December 2015 (evening)							
Location	Time	Total dB(A), Wind speed/ Temp Grad Identified Noise Sources					
		Leq (15 min)	direction	(°C/100m)1			
R4 Oakleigh	7:58 pm	42	1.3/296	Lapse	Traffic (39), birds & insects (38), NM (27)		
R13 Newhaven	8:38 pm	47	2.3/311	+2.5	Frogs & insects (36), NM (29*)		
R16 Belah Park	7:00 pm	38	0.7/296	+0.4	Birds (37), traffic (32), NM barely audible		

*Noise from vent fan

Table 3: NM Operational Noise Monitoring Results – 1 December 2015 (Night)							
Location	Time	Total dB(A), Wind speed/ Temp Grad Identified Noise Sources					
		Leq (15 min)	direction	(°C/100m)			
R4 Oakleigh	10:07 pm	44	3.1/217	Lapse	Insects (44), NM (27)		
R13 Newhaven	11:25 pm	43	3.9/254	Lapse	Frogs & insects (39), NM (22*)		
R16 Belah Park 11:45 pm 34 3.4/210 Lapse Traffic (34), NM barely audible							

*Noise from vent fan

Table 4: NM Operational Noise Monitoring Results – 2 December 2015 (day)							
Location	n Time Total dB(A), Wind speed/ Temp Grad Identified Noise Sources						
		Leq (15 min)	direction	(°C/100m)			
R4 Oakleigh	9:09 am	50	6.9/306	n/a	Wind (50), NM inaudible		
R13 Newhaven	12:01 pm	47	7.2/301	n/a	Birds (43), wind (43), NM (25*)		
R16 Belah Park	11:15 am	49	6.4/308	n/a	Wind (48), birds & insects (40), NM inaudible		

*Noise from vent fan



Table 5: NM Operational Noise Monitoring Results – 2 December 2015 (evening)							
Location	Location Time Total dB(A), Wind speed/ Temp Grad Identified Noise Sources						
		Leq (15 min)	direction	(°C/100m)			
R4 Oakleigh	7:56 pm	36	2.9/225	Lapse	Birds & insects (34)), NM (32)		
R13 Newhaven	9:28 pm	47	3.1/215	Lapse	Frogs & insects (36), NM (29*)		
R16 Belah Park 8:35 pm 41 3.1/217 Lapse Insects (39), traffic (36), NM (30)							

*Noise from vent fan

Table 6: NM Operational Noise Monitoring Results – 2/3 December 2015 (night)							
Location	Time	Total dB(A), Wind speed/ Temp Grad Identified Noise Sources					
		Leq (15 min) direction (°C/100m)					
R4 Oakleigh	10:01 pm	28	3.4/181	+2.0	Traffic (27), insects (22), NM inaudible		
R13 Newhaven	12:30 am	47	5.3/138	Lapse	Frogs & insects (38), NM (29*)		
R16 Belah Park 11:20 pm 34 3.8/153 Lapse Traffic (31), NM (30), insects (25)							

*Noise from vent fan

Table 7: NM Operational Noise Monitoring Results – 3 December 2015 (day)							
Location	Time	Total dB(A),	Wind speed/	Temp Grad	Identified Noise Sources		
		Leq (15 min)	direction	(°C/100m)			
R1 Bow Hills	9:36 am	45	6.9/140	n/a	Traffic (45), NM inaudible		
R2 Ardmona	10:42 am	44	6.5/137	n/a	Traffic (43), birds & insects (36), NM inaudible		
R4 Oakleigh	11:23 am	38	4.6/123	n/a	Wind (37), traffic (30), insects (28), NM inaudible		
R6 Matilda	10:09 am	47	6.2/137	n/a	Wind (46), birds (35), NM inaudible		
R13 Newhaven	2:46 pm	44	4.6/118	n/a	NM (26*), frogs & insects (31)		
R16 Belah Park	1:10 pm	41	4.6/139	n/a	Traffic (41), birds & insects (23), NM inaudible		

*Noise from vent fan

Table 8: NM Operational Noise Monitoring Results – 3 December 2015 (evening)							
Location	Time	Total dB(A),	Wind speed/	I/ Temp Grad Identified Noise Sources			
		Leq (15 min)	direction	(°C/100m)			
R1 Bow Hills	8:40 pm	48	8.7/126	Lapse	Wind (47), traffic (40), NM inaudible		
R2 Ardmona	8:00 pm	46	7.0/120	Lapse	Wind (45), traffic (40), NM inaudible		
R4 Oakleigh	7:20 pm	50	7.6/121	Lapse	Wind (50), NM inaudible		
R6 Matilda	8:19 pm	50	8.0/124	Lapse	Wind (49), insects (40), NM inaudible		
R13 Newhaven	9:40 pm	52	8.1/125	Lapse	Wind (47), frogs & insects (47), NM (30*)		
R16 Belah Park	9:00 pm	50	9.3/125	Lapse	Wind (50), NM inaudible		

*Noise from vent fan



Table 9: NM Operational Noise Monitoring Results – 3/4 September 2015 (night)								
Location	Time	Total dB(A),	Wind speed/	Temp Grad	Identified Noise Sources			
		Leq (15 min)	direction	(°C/100m)				
R1 Bow Hills	12:21 am	40	5.1/132	Lapse	Traffic (40), frogs & insects (30), NM inaudible			
R2 Ardmona	11:18 pm	38	5.7/133	Lapse	Traffic (35), insects (35), NM inaudible			
R4 Oakleigh	10:12 pm	44	6.4/130	Lapse	Wind (43), insects (35), NM inaudible			
R6 Matilda	11:49 pm	38	5.1/132	Lapse	Insects (36), wind (33), NM inaudible			
R13 Newhaven	1:55 am	47	4.2/131	Lapse	Frogs & insects (36), NM (29*)			
R16 Belah Park	12:43 am	45	4.7/131	Lapse	Wind (45), NM inaudible			

*Noise from vent fan

Table 10: NM Sleep Disturbance Monitoring Results – 1 December 2015 (night)								
Location	Location Time dB(A),L1 (1 min) Wind speed / direction Temp Grad(°C/100m)							
R4 Oakleigh	10:07 pm	36	3.1/217	Lapse				
R13 Newhaven	11:25 pm	26*	3.9/254	Lapse				
R16 Belah Park	R16 Belah Park 11:45 pm <30 3.4/210 Lapse							

*Noise from vent fan

Table 11: NM Sleep Disturbance Monitoring Results – 2 December 2015 (night)							
Location	Time dB(A),L1 (1 min) Wind speed / direction Temp Grad(*C/100r						
R4 Oakleigh	10:01 pm	n/a	3.4/181	+2.0			
R13 Newhaven	12:30 am	34*	5.3/138	Lapse			
R16 Belah Park	11:20 pm	37	3.8/153	Lapse			

*Noise from vent fan

Table 12: NM Sleep Disturbance Monitoring Results – 3/4 December 2015 (night)							
Location	Time	dB(A),L1 (1 min)	Wind speed / direction	Temp Grad(°C/100m)			
R1 Bow Hills	12:21 am	n/a	5.1/132	Lapse			
R2 Ardmona	11:18 pm	n/a	5.7/133	Lapse			
R4 Oakleigh	10:12 pm	n/a	6.4/130	Lapse			
R6 Matilda	11:49 pm	n/a	5.1/132	Lapse			
R13 Newhaven	1:55 am	33*	4.2/131	Lapse			
R16 Belah Park	12:43 am	n/a	4.7/131	Lapse			

*Noise from vent fan

During the December 2015 monitoring, under the operating and meteorological conditions at the times, for the worst case 15 minute compliance measurement periods, the mine noise was compliant at all monitoring locations at all times. Additional attended monitoring was undertaken at a private residence during January 2016 in relation to a complaint however, no compliance issues were identified during this monitoring.



Month	ND1 Turrabaa	ND2 Claremont	ND3 Bow Hills	ND4a New Matoppo	ND5 Claremont	ND6 Willarah	ND7 Claremont	ND8 Claremont	ND11 Oakleigh	ND12 Merriman
Mar-15	3.3	1.5	0.9	1.8	3.6	3.1	1.7	1.5	1.9	1.4
Apr-15		2.7	0.6	8.5	0.2	1.3	2.2	2.0	0.8	2.6
May-15	4.3	0.7	1.1	1.7	2.8	0.4	0.9	0.3	1.4	0.3
Jun-15	2.9	2.2	0.6	2.1	2.8	0.6	0.7	0.5	0.8	0.2
Jul-15	4.9	6.7	0.6	1.8	6.5	0.4	0.8	2.8	0.6	0.1
Aug-15	1.2	3.3	0.7	1.8	3.2	0.1	1.2	1.9	0.4	0.5
Sep-15	3.2	3.7	1.4	2.8	10.3	1.0	4.8	1.3	1.1	1.3
Oct-15	6.4	1.4	0.6	0.7	2.8	0.9	1.0	2.0	1.5	0.6
Nov-15	9.4	23.0	0.8	4.0	2.6	1.3	3.0	3.9	4.6	0.7
Dec-15	3.7	2.2	0.8	2.8	2.6	2.1	0.8	1.6	0.9	1.3
Jan-16	1.2	0.7	0.5	2.9	2.4	0.9	0.8	0.3	0.1	1.4
Feb-16	0.9	2.5	0.8	1.0	2.4	1.3	3.5	1.4	9.4	0.9
Annual Average	3.8	4.2	0.8	2.7	3.5	1.1	1.8	1.6	2.0	0.9

Deposited Dust Monitoring

Deposited dust levels are within compliance limits with the exception of ND2, which is due to a high level recorded in November 2015 due to nearby harvesting activities. The ash component of this dust gauge, i.e. indicative of mineral type contamination is $2.2 \text{ g/m}^2/\text{mth}$, below the annual average limit of $4 \text{ g/m}^2/\text{mth}$. All other dust gauges have remained at relatively low levels since the last meeting.

High Volume Air Sampling (PM₁₀)

 PM_{10} measurements taken to the end of January 2016 for the "Claremont" High Volume Air Sampler (HVAS) are returning a running annual average of 9.44 μ g/m³, which is well below the annual average limit of 30 μ g/m³.





 PM_{10} measurements taken to the end of January 2016 for the "Turrabaa" High Volume Air Sampler are returning a running annual average of 9.55 µg/m³, which is also well below the annual average limit of 30 µg/m³.



PM₁₀ levels have remained compliant since the last meeting.

Groundwater Monitoring

Groundwater monitoring was completed in December 2015. Nested piezometers have been installed on the "Omeo" and "Kurrajong" properties and two sets are also installed on the mine site to monitor the effects of the Longwall operation. Results of these units is included below.

























































Monitoring well P13 water levels have stabilised with levels slightly recovering over the previous two monitoring rounds. In the area of P13 pre-drainage of water and gas commenced in February 2011 and was completed during November 2013. It is considered likely that any impacts to the standing water level would have been identified during 2011. Bore P13 is 30 m deep and targets the Garrawilla Volcanics. A production bore, WB2, is approximately 300 m to the south and targets the same aquifer and as such the drop in water level in P13 is likely associated with production from WB2.

Montoring well P15 had shown a steady decrease in water level since March 2014, during the March and June 2015 monitrong rounds it had recovered to near background levels, however the level has since decreased again. P15 is installed to 30m and is located above longwall panel (LW) 105 which is now being extracted and this is the likely cause of the water level drop. P14 is installed at the same location to 78m and it has been intermittently dry which is not attributable to mining, i.e. recorded dry in July 2012 well before development commenced in the area around P14/P15. Given the mine has gone beyond this point in LW105, the water level in P15 will likely recover in the future.

Surface Water Monitoring

No wet weather discharges or flows in surrounding creeks were sampled during the period December 2015 to February 2016.



Subsidence

Narrabri Mine has monitored the subsidence movement across the surface of LW101 to LW105 in accordance with the approved Extraction Plan. The table below outlines the maximum subsidence parameters recorded as part of the subsidence monitoring program and a comparison with the maximum predicted subsidence parameters as outlined in the Extraction Plan. Monitoring has been undertaken on the 11kv power line that traverses the southern end of LW101 to LW105.

LW101 to LW105 Predicted and Measured Subsidence Parameters						
	Maximum Predicted Extraction Plan	Maximum Measured				
Line 101 – Centre of LW101						
Subsidence (m)	2.69	2.633				
Tilt (mm/m)	47	29.1 – 46.3				
Tensile Strain (mm/m)	12.5 – 25^	8.7 – 20.7				
Compressive Strain (mm/m)	16 – 32^	7.5 – 26.6				
Angle of Draw (°, Degrees)	22.5 - 26.5	20.2				
Line 102 – Centre of LW102						
Subsidence (m)	2.69	2.694				
Tilt (mm/m)	45	43.7				
Tensile Strain (mm/m)	11.5 – 23^	20.5				
Compressive Strain (mm/m)	15 – 30^	46.7				
Angle of Draw (°, Degrees)	22.5 – 26.5	20.8				
Line 103 North – Centre of LW103 Northern End						
Subsidence (m)	2.75	2.688				
Tilt (mm/m)	34	40.2				
Tensile Strain (mm/m)	8 - 16^	18.8				
Compressive Strain (mm/m)	10 - 20^	27.9				
Angle of Draw (°, Degrees)	22.5 - 26.5	18.1				
Line 103 South – Centre of LW103 South	outhern End					
Subsidence (m)	2.75	2.524				
Tilt (mm/m)	34	30.3				
Tensile Strain (mm/m)	8 - 16^	9.3				
Compressive Strain (mm/m)	10 – 20^	8.7				
Angle of Draw (°, Degrees)	22.5 - 26.5	20.2				
Line 104 North – Centre of LW104 No	orthern End					
Subsidence (m)	2.75	2.756				
Tilt (mm/m)	34	48.4				
Tensile Strain (mm/m)	8 – 16^	42.6				
Compressive Strain (mm/m)	20 - 40^	42.3				
Angle of Draw (°, Degrees)	22.5 – 26.5	18.7				
Line 104 South – Centre of LW104 South	outhern End					



LW101 to LW105 Predicted and Measured Subsidence Parameters						
	Maximum Predicted Extraction Plan	Maximum Measured				
Subsidence (m)	2.75	2.614*				
Tilt (mm/m)	34	30.3*				
Tensile Strain (mm/m)	8 – 16^	7.5*				
Compressive Strain (mm/m)	20 - 40^	6.1*				
Angle of Draw (°, Degrees)	22.5 – 26.5	13.2*				
Line 105 North – Centre of LW104 Northe	ern End					
Subsidence (m)	2.75	2.543*				
Tilt (mm/m)	30	45.8*				
Tensile Strain (mm/m)	6.5 – 13	17.7*				
Compressive Strain (mm/m)	17 – 34	44.6*				
Angle of Draw (°, Degrees)	22.5 – 26.5	15.3*				
Line A – Cross Panel Survey Line						
Subsidence (m)	2.75	2.655*				
Tilt (mm/m)	47	56.3*				
Tensile Strain (mm/m)	12.5 – 25^	19.1*				
Compressive Strain (mm/m)	20 - 40^	26.7*				
Angle of Draw (°, Degrees)	22.5 – 26.5	24.2*				
Line B – Pine Creek Tributary 1						
Subsidence (m)	2.75	2.589*				
Tilt (mm/m)	47	54.8*				
Tensile Strain (mm/m)	12.5 – 25^	13.1*				
Compressive Strain (mm/m)	20 - 40^	11.0*				
Gradient Change (%)	Up to 6	5.47*				
Line D – Pine Creek						
Subsidence (m)	2.75	2.650*				
Tilt (mm/m)	47	32.9*				
Tensile Strain (mm/m)	12.5 – 25^	10.6*				
Compressive Strain (mm/m)	20 – 40^	15.0*				
Gradient Change (%)	Up to 6	3.29*				
Line E – Pine Creek Tributary 1 Crossline	1					
Subsidence (m)	2.75	1.013				
Tilt (mm/m)	47 26.9					
Tensile Strain (mm/m)	12.5 – 25^	9.2				
Compressive Strain (mm/m)	20 - 40^	2.9				
Line F – Pine Creek Tributary 1 Crossline	2					
Subsidence (m)	2.75	2.698				
Tilt (mm/m)	47	59.1				



Maximum Predicted Extraction					
	Plan	Maximum Measured			
Tensile Strain (mm/m)	12.5 – 25^	6.6			
Compressive Strain (mm/m)	20 – 40^	21.7			
Line G – Pine Creek Tributary 1 Crossline	3				
Subsidence (m)	2.75	1.388*			
Tilt (mm/m)	47	28.7*			
Tensile Strain (mm/m)	12.5 – 25^	10.1*			
Compressive Strain (mm/m)	20 – 40^	11.4*			
Electricity Transmission Lines – 11kV Pov	ver Lines				
Pole 2					
Subsidence (m)	0	0.046			
Dynamic Tilt (mm/m)	0	9.09			
Final Tilt (mm/m)	0	9.09			
Conductor length change between poles 2-3 (m)	0.13	0.56			
Conductor Clearance Loss (m)	0.77	+0.714			
Pole 3	· · · ·				
Subsidence (m)	2.18	2.085			
Dynamic Tilt (mm/m)	30	66.3			
Final Tilt (mm/m)	12	50.08			
Conductor length change between poles 3 - 4 (m)	0.28	-0.81			
Conductor Clearance Loss (m)	1.10	-1.517			
Pole 4	L L				
Subsidence (m)	2.11	2.063			
Dynamic Tilt (mm/m)	25	74.23			
Final Tilt (mm/m)	15	31.80			
Conductor length change between poles 4 - 5 (m)	0.13	0.48			
Conductor Clearance Loss (m)	0.07	+1.200			
Pole 5					
Subsidence (m)	0.31	0.238			
Dynamic Tilt (mm/m)	2	25.66			
Final Tilt (mm/m)	2	19.40			
Conductor length change between poles 5 - 6 (m)	0.024	0.97			
Conductor Clearance Loss (m)	0.30	+1.842			
Pole 6					
Subsidence (m)	1.41	1.645			



LW101 to LW105 Predicted and Measured Subsidence Parameters					
	Maximum Predicted Extraction Plan	Maximum Measured			
Dynamic Tilt (mm/m)	27	132.483			
Final Tilt (mm/m)	27	129.68			
Conductor length change between poles 6 – 7 (m)	0.274	-1.029			
Conductor Clearance Loss (m)	1.30	1.010			
Pole 7					
Subsidence (m)	2.42	2.614			
Dynamic Tilt (mm/m)	3	215.912			
Final Tilt (mm/m)	3	129.68			
Conductor length change between poles 7 – (m)	0.034	-			
Conductor Clearance Loss (m)	1.71	-			

* - subsidence development incomplete.

^ - values for 'smooth' and 'discontinuous' (i.e. crack affected) subsidence profiles.

Based on the above table, subsidence prediction exceedances have occurred above LW101 to LW105:

- The maximum subsidence measurements were within +/- 10% of the predicted value of 2.75 m.
- The maximum tilt measurements were within 15% of the predicted values for the centreline lines of LW101, LW102 and LW103. >90% of the measured tilts in LW104 and LW105 were within the predicted range.
- The maximum tensile strain measurements were generally within the predicted range of the values of 11 mm/m (smooth profile) and 22 mm/m (discontinuous or crack affected profiles). >90% of the measured tensile strain values in LW104 and LW105 were within the predicted range.
- The maximum compressive strain measurements were generally within the range of the predicted values of 14 mm/m (smooth profile) and 28 mm/m (discontinuous or crack affected profiles) with the exception of: LW102, which recorded a maximum compressive strain of 46.7 mm/m; LW104, which recorded a maximum compressive strain of 42.3 mm/m; and LW105, which recorded a maximum compressive strain of 44.6 mm/m. However, 99% (LW102), 98% (LW104) and 96% (LW105) of the measured compressive strains were within the predicted range.

The centreline subsidence results for LW101 to LW105 indicate that the Garrawilla Volcanics and Basalt Sill have not reduced subsidence through spanning behaviour.

The maximum subsidence is also considered closer to 63% of the average mining height of 4.3m. The subsidence predictions have been updated as part of the latest modification for the mine and the revised values will be included in a revision to the site's Extraction Plan.

Complaints

Four formal complaints were received during the period December 2015 to February 2016. Two were in relation to noise, one was in relation to dust and one was in relation noise and dust.

The noise complaints were followed up and the necessary actions taken, including arranging for additional attended monitoring. The new management measures were also discussed, which includes a temperature inversion tower and additional mobile noise units. The dust complaint, relating to dust coming from the coal stockpiles, was actioned at the time of the complaint with additional sprays activated and the dozers were directed to modify their operation and use a shorter push.



Environmental Incident(s)

No environmental incidents occurred during the December 2015 to February 2016 period.







Narrabri Mine Community Consultative Committee Meeting Minutes

Meeting No:	33
Date:	Wednesday 22 nd June 2016
Time:	4:05pm
Location:	Narrabri Mine Site Office
Present:	Russell Stewart (RS) – Independent Chairman
	James Stieger (JS)
	Rodney Dunlop (RD)
	Peter Webb (PW)
	Geoff Hunter (GH)
	Catherine Redding (CR) – Narrabri Shire Council Delegate
	Steve Bow (SB) – Narrabri Mine General Manager
	Dave Ellwood (DE) – Narrabri Mine Technical Services Superintendent
	Steve Farrar (SF) – Narrabri Mine Environmental Superintendent

1. APOLOGIES

Mark Foster

2. DECLARATION OF PECUNIARY OR OTHER INTERESTS

None.

3. PREVIOUS MINUTES

Moved: RD Seconded: JS

3.1. BUSINESS ARISING FROM PREVIOUS MINUTES

SF followed up on whether or not NSC had approached Whitehaven in relation to the NSC submission on the Inland Rail project, to which the answer was no. Whitehaven logistics personnel keep an eye on developments but it is a separate rail line to what the mine utilises. JS said with the project the mine could take coal north. RS said it is in the State's interest not to send coal north or grain for that matter.

4. GENERAL BUSINESS

4.1. OPERATIONS PROGRESS REPORT

The operations update was provided as follows:

Mine Progress Report (to 31 May 2016)

Coal produced (t):	May 2016	139,179	
	FY-to-date	6.713.891	



Coal Railed (t):	May 2016	564,576					
	FY-to-date	7,216,006					
Average workforce numbers (May 2016):							
	NCO	Waged – 158					
		Salary – 107					
		Total – 265					
	Contractors	Total – 102					
Safety Update (FY to	o May 2016):						
	Lost Time Injury (LTI)	3					
	Days LTI Free:	103					
	Total Recordable Injuries:	16					
	Planned Task Observations:	7,482					
	Take 5 Assessments:	110,375					
	Work Hours (Feb-16):	105,285					

SF went through the report. SF said there were some additional contractors onsite during the month for the longwall move. DE said this would decrease again before the next meeting.

DE stated that over 90% of our injuries are below the elbow. DE also said the injuries are not major but still occurring. RS said this would stuff your figures up, DE said an injury is an injury and that's the way to look at it.

CR asked about coal produced versus coal railed and that there is a big difference to which DE replied we started the FY with big stocks onsite. CR said that is what she was going to ask if it is carried over to which DE replied yes and we railed that coal which is why there is a difference. DE said it will likely be similar next FY. SF said in a perfect world you would take the produced and railed figures and the difference would be what is stockpiled onsite.

SB arrived to meeting around 4:12pm.

SB said he didn't have anything to add to the operations report only that it is fairly routine to which DE added that it is now following the longwall move.

4.2. ENVIRONMENTAL OVERVIEW

The environmental monitoring report was provided to the CCC members and SF went through the report.

RD asked if the mine had had any discharges to which SF said no, it hasn't started to run off of the paddocks just yet. JS said the clays will soak up a bit more but a good down poor and it will run to which SF stated it is muddy out the back.

JS asked where the subsidence exceedances were recorded. SF replied that in the 2nd and 4th longwall panels some high compressive strains were recorded. RS asked what you put that down to which SF replied it's a prediction based off of a model. JS asked it isn't heaps off is it? DE replied a lot of those one-offs are associated with our roads where the surface is compacted. JS asked if it was sinking more than expected to which SF replied it is generally related to cracks not the actual subsidence and the amount it drops. JS asked what you do about that to which SF replied we plough them up except cultural heritage sites, which we are working on how to fix them up. GH

asked about tensile and compressive strains to which SF replied tensile are the cracks and compressive are the humps. GH asked about the units, which SF and DE explained. GH asked how it is measured and DE explained by installing star pickets and surveying them to measure changes in distances between two points. SB said before mining you have a flat surface, install a few pegs and then following mining the points will be closer together or further apart. DE said that on roads where it is compacted you can notice the compressive strains more. GH asked if an 8mm strain will always have the same crack. SB said that sandstone may have different properties and DE said that sandy soils and soils around creeks might not crack as much as sandstone as it cannot compress or expand as much as the soils can. SF said we could organise another tour before the next meeting. GH and RS said they were fine and didn't require a tour.

CR asked what the new noise management measures are? SF replied we have installed a 60m tower to measure inversion conditions, which alarms to our prep plant. SF also said we have added 2 new noise units. DE said we are still going through the process of getting the system up and running but our biggest issue is trying to sort road noise from mine noise. CR asked if they were on mine land to which SF replied the two new ones will be on mine land but at our northern and southern boundaries. SF said we have one at our southern boundary and the northern one will go out next week. SB said they are mobile but they alarm in real-time and you can listen to the unit in real-time. RS asked if the noise is track slap to which DE said yes. RS asked if the mine has considered rubber tracks to which JS replied they have considered it but it won't work. RD said it is a problem at every mine site. DE said we have tried some noise attenuation on the dozers by filling idlers with rubber with varying degrees of success. SB said we have 2 CAT and 2 Komatsu dozers and during the change out they have done some work like changing the weights of the tracks but he is not sure if it will help or not. SB said the Komatsu's haven't done it before but some CAT's have been done in the past. RS asked if it were quieter now but DE said it is hard to tell the difference. JS said if you went back 8 years ago they said they would have rubber tracked dozers and they trialled one at the prep plant in Gunnedah but it was a failure as it was just too hard on the gear. GH asked if the mine was still having noise problems and if the mine had purchased the main complainant? SB stated that the only complaints we get now are from the south. SF stated we had purchased two properties to the NE. SB said we now get complaints from the south so we put a trailer there and we have had some monitoring failures there. SB said the mine doesn't have many neighbours so it's not a suburb but one or two. SF stated that it is a quiet rural environment and we are the only industrial noise source around. SB said it is the time of the year when it's cold. RD asked what triggers we have for inversions which SF explained. RD asked if the mine would be interested in making that information available publicly as it is a significant asset in the region and spray drift this year in cotton was a huge issue and a big part of that is spraying during inversions. RD said if that information was made available it would be a great asset for the region. SF said there would be work to do to determine if it is representative of the region and RD said at the minute there is nothing. RD said there is information on the spray labels around not spraying during inversions yet no one knows when these conditions are occurring. DE said to note and the mine would look into it. SF said it can be sent somewhere but not sure where. RD said NarrabriWeather.net is used in the area. SB asked if this is different to the BoM website, RD said it is a local website with about 25 weather stations.

GH asked about the dust complaints, SB said they are from the same complainant and relate to activity on the stockpiles. GH asked about the sprays and if they are working and if complaints will go down, SB said the dust complaints are nothing on mass but it is something we manage all the time. DE said at the end of the longwall blocks when emptying stockpiles is when we have dust issues but the sprays are operating as much as possible. SF said some of the complaints relate to dusty days and the sprays are not on. GH asked if it is a few days where it would be bad for dust, SB said during the hot/dry summer it dries the coal out so we have to use sprays. SB also said that as the wind picks up we shut the plant down. GH asked about coal coming off the stockpiles even with no activity to which SB said we can get lift off but we have procedures developed with the EPA to manage which includes triggers and alarms. SF said the product tripper has a wind sensor on it and it alarms to the prep plant and they have a TARP that says you need to do certain things based off of the wind speed. SB said this has been in place for a couple of years following a dust storm and we got in trouble off of the EPA for that and all of the work done is in response to that event,

which was an extreme weather event. DE said dust complaints can now relate to a 'willy willy' going over the stockpile and pulling dust up which can be seen from a distance and these can be very difficult to combat. GH asked about landing on cars/houses to which DE replied its visible dust. RS said he was recently driving and saw a dust cloud from scarifying activities on farm land it was a huge amount of dust.

5. NEW BUSINESS

RS said he would like to thank NCO for hosting the Vice Chancellor of UNE as the aim is to make Narrabri a centre for agricultural study and a regional study centre. RS said they were here for 4 days and while they were here he wanted to show them the whole place and one of things that come out of the visit here was that there are other opportunities in relation to what they deliver for example engineering. RS stated that changes to the system now mean the funding relates to the student not the University or the deliverer. RS said it was good we could show them there is a lot going on. RS said they weren't talking about facilities here as we have plenty of them but about a whole delivery here so young people don't have to leave. RD asked if Whitehaven has some UNE graduates, SB said most people we employ are engineers and he wasn't sure if UNE offered that. SB said most of the engineers come from Newcastle or Queensland universities. RS said what you need to do, particularly for Ag as you drag them off farm, is to give them the opportunity to stay.

GH said he had read that a review of CCC's for all mines has been done and if the mine has any feedback or expectations of the CCC members. SB said he hasn't seen any feedback. GH said the part the he saw is for the CCC to ensure the mine follows the management or approval plan and there were some issues with the chairman being paid and not seen as impartial. GH asked if the mine had any thoughts on what the CCC role should be because sometimes he feels that the mine could tell him anything. SB said from his point of view, and he has been involved in a few CCC's, is for the CCC to be a conduit for information but not a regulator as we have those in place. SB said CCC's don't generally have the skill set to regulate mine activities. GH said thinking about the ROM side there when we were expanding that that this is in addition to the approval and to him that his understanding is to make sure we are not working outside that but not in a regulatory sense but this gives some basis to why the CCC is here. SB said we have a duty around consultation and to share that information in this forum and we have to go back to the government to seek approval. SB asked DE around exploration work but DE said it hasn't been raised as yet. SF said there is a new draft guideline for CCC's and offered a copy to GH. SB said in terms of compliance we have 3 primary regulators being the Department of Planning, Department of Resources and Energy and the EPA. GH said he would leave them to work out how big the ROM is and whether you work at 2 o'clock at night but on a macro scale we are going to increase the ROM by a percentage and that's where the CCC fits in. SB said that's right and is part of consultation and we also went to Council to which CR said they were aware of it. SB said we also have to put ads in the papers. SB said it is primarily information sharing and an opportunity for feedback. DE said it is a conduit between us and the community. RS asked if SF could get the draft to GH and then asked if all CCC members could have a copy. GH said it should give a bit more direction in what the CCC do. RS said this section of General Business should be New Business and this is where these things can be raised. JS said he sometimes get requests for information from people in the community. SF stated to GH that if the CCC is not comfortable with things we talk about the mine can get experts or Government agencies in to explain it to the CCC, CR said that is part of the guideline. RS said the EPA have an office in Narrabri and SF said if they have a local office there is a fair chance they will attend meetings. RS said with experience at another CCC he is on that the EPA are good at answering questions and turning up with information, even questions without notice. RS said they requested that the EPA put staff in Narrabri and they could be invited and have them there to discuss what their job is and to answer questions. SF said to GH if he has any requests to go through the Chair. DE said he if he has any questions on any of the information he can approach the mine outside of the meetings if he wants. RS said the other CCC he is involved with they get visitors quite regularly but it is way more controversial than any other CCC he is on and it is a good CCC but there is a lot that can be digressed. SF said the EPA is the regulator for the CSG industry.

DE said that the mine has a southern exploration licence but in the next financial year we are looking to spend some money down there. DE explained that some access agreements will be sought in the future and we already have one with State Forests which is where the majority of the work will be. DE said he

doesn't have any plans for the meeting and over the next couple of months we'll approach landholders for access and this is to let the CCC know that we are planning to do some work down there. GH asked what we were looking at doing and DE said it depends on the budget but around 20 boreholes, majority in the Forest with a few on farm land. DE said any boreholes on farm land we will work with landholders as they are not fixed and can be moved around. GH asked if we leave anything there afterwards and DE said the plan is no and the rehab guidelines say we have to cut it off a metre below the ground. CR asked about the size of the borehole, DE replied that they around 6-8 inch borehole cased with PVC or steel depending on the geology but once done they are cut off below the surface and the plan is that once rehabbed you wouldn't know we had been there. RS asked if there was a typical depth, DE replied that it is around 160-330m similar to the mine. DE also explained that we no longer use in ground sumps. SF said most of the disturbance is when we go back to cut it off below the ground. DE said we are going through the process now to design that over the next 12 months and that we will be engaging with landholders in the next couple of months so if the CCC get any questions to pass them on but we don't know which landholders yet. GH said the first question will be when are they going to buy me to which DE replied the answer to that is that we need to know what coal is there first. GH said realistically we have enough coal for a few years yet to which SB replied there a couple of decades in the current lease but planning lead times are such that we need to start the work now so we can mine in that area. DE said approval lead times are around 5 years. GH said there are people waiting there for the mine now and SB said he has spoken with a few of them. CR asked how far down south to which DE replied directly west from Baan Baa but a couple of kilometres from the highway. DE said somewhere down there the coal seam does split but we don't know anything about it which is why we need to do some drilling. GH asked if we have any way we are going to let that out other than talk to landholders such as in a newsletter or something because once you talk to a few people they will all know? SF said we are required to do newsletters for the exploration lease and it would target people in the area. DE said he didn't want to send a plan out in a newsletter saying we are going to put a borehole here and scare someone because it's next to a house because we wouldn't do that. SB said there is a process to go through and that includes knocking on doors.

RS said that interestingly enough that before a Regional Development Australia meeting in Quirindi, after information was released that Santos was going through the Liverpool Plains, RS explained it was an old document that someone has pulled out and told people that this is what is happening. RS also explained that the requirements for Santos were requested by the Government and he was wondering if the mine had similar requirements for exploration. DE said as part of the new application and you have to state what you will do for the next 12 months and then beyond and they will hold you to the next 12 months. RS asked if they can direct us where to go. SB said he hadn't heard of that before but you have to show intent to develop it as it is a State asset otherwise they can take it off you. RS asked if it is fair to say that if you were an exploration company you would go and give us the whole area? SB said typically the Government would release an area and if you were interested in an area you can knock on their door but they usually go to market and it becomes an auction. SB said there are new guidelines coming out as the Government hasn't released areas for a number of years. DE said rather than going to Ministers it goes to allocation committee's which are effectively independent committees. SB said for the Santos thing he has no idea and RS said he knows he will get asked. SB said unless there was a legacy lease that was owned by Eastern Star that they picked up. DE said if it is a separate lease they may be required to spend money on it separate to the other areas.

RD stated that GH's comments got him thinking about CCC's and that of the 3-4 that he has been involved with sitting on the other side of the table and that his perception of this CCC is that it is the most pleasant and transparent one that he has been involved in and to have commitment from the General Manager shows real commitment to the committee. GH asked if GM's don't turn up to which RD replied yes. CR said she would have to agree that this CCC is very good. RS said it is because there is no slinging going on that gets personal, which can happen and then you can't get the same buy in without the GM there. JS said he has been involved in 31 or 32 meetings out of 33 and it started well but the one thing that annoyed them was that the mine knew what the next stage was going to be but the mine never let them know until they had to. JS said the CCC should know soon as opposed to 2 years' time because that's what happens normally. SB said it's a balance and we are running a business and you are always looking at what you're doing and timing is an issue. SB said he has met most of the farmers down there and they do want us to buy their farms and the mine has said no because first you have to prove there is coal there, which is step 1. SB said we are currently thinking of a lot options for the site and historically there were plans for a



separate mine down there but it won't be, it will be part of this if it proves to be economic. JS said you get broad sided and at the beginning it was just going to be tunnels, 1Mtpa and 3 trains a week and then all of sudden it is what it is today and had he known what he knows now it might have changed things. CR said it is probably the same as the stockpile approval and SF said the CCC did go through that at some point. SB said the footprint was more around the mine discovering how hard it is to get trains from Newcastle to here. SB said even last week there was a derailment at Bulga, which cost the mine 3 trains.

RS asked about trains leaving there high beam on? SB replied he did not know of any requirements. JS asked about the trains using their horns and stated that he can notice when the new drivers are on. JS stated that if they are in their corridor they could have the high beam on.

6. NEXT MEETING

Wednesday 7th September 2016 at 4:00pm. Narrabri Mine Site Office.

7. CLOSURE OF MEETING

Meeting closed at 5:15pm.



Narrabri Mine Community Consultative Committee Meeting #33

Environmental Monitoring Report: March – May 2016

Noise Monitoring

Attended noise monitoring was undertaken between Monday 14th to Wednesday 16th March 2016 (Tables 1-12) and on the 11th May 2016 (Tables 13-16) to verify if noise levels were within compliance limits. The results from this monitoring are detailed in the tables below.

Table 1: NM Operational Noise Monitoring Results – 14 March 2016 (day)							
Location	Time	Total dB(A), Leg (15 min)	Wind speed/direction	Temp Grad (°C/100m)	Identified Noise Sources		
R4 Oakleigh	11:40 am	35	2.7/294	n/a	Birds (34), NM (24), traffic (23)		
R13 Newhaven	3:22 pm	45	3.8/121	n/a	Wind (45), NM (12*), birds (26)		
R16 Belah Park	1:35 pm	38	6.5/196	n/a	Wind (36), birds (31), traffic (30), NM inaudible		

*Noise from mine

Table 2: NM Operational Noise Monitoring Results – 14 March 2016 (evening)							
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources		
		Leq (15 min)	speed/direction	(°C/100m)			
R4 Oakleigh	7:43 pm	42	1.3/130	Lapse	Insects (42), traffic (26), NM inaudible		
R13 Newhaven	9:16 pm	38	2.2/151	Lapse	Insects (35), NM (16*), traffic (27)		
R16 Belah Park	8:31 pm	37	1.5/130	Lapse	Traffic (34), NM (32), insects (29)		

*Noise from mine

Table 3: NM Operational Noise Monitoring Results – 14/15 March 2016 (Night)							
Location	Time	Total dB(A), Leq (15 min)	Wind speed/direction	Temp Grad (°C/100m)	Identified Noise Sources		
R4 Oakleigh	10:03 pm	31	1.7/111	Lapse	Insects (28), traffic (28), NM inaudible		
R13 Newhaven	12:34 am	32	2.3/156	Lapse	Traffic (28), NM (10*), insects (25)		
R16 Belah Park	11:17 pm	36	2.7/136	Lapse	Insects (34), traffic (31), NM (26)		

*Noise from mine

Table 4: NM Operational Noise Monitoring Results – 15 March 2016 (day)								
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources			
		Leq (15 min)	speed/direction	(°C/100m)				
R1 Bow Hills	9:38 am	40	5.4/123	n/a	Wind (38), traffic (34), birds (28), NM inaudible			
R2 Ardmona	9:15 am	43	4.9/127	n/a	Traffic (42), birds (35), wind (29), NM inaudible			
R4 Oakleigh	7:34 am	37	4.7/139	n/a	Traffic (35), birds (32), wind (27), NM inaudible			
R6 Matilda	7:05 am	42	3.1/151	n/a	Birds (42), traffic (28), NM inaudible			
R13 Newhaven	11:57 am	38	5.3/138	n/a	Birds (36), wind (34), NM inaudible			
R16 Belah Park	10:02 am	46	5.0/124	n/a	Wind (46), traffic (27), birds (26), NM inaudible			



Table 5: NM Operational Noise Monitoring Results – 15 March 2016 (evening)								
Location	Time	Total dB(A), Leq (15 min)	Wind speed/direction	Temp Grad (°C/100m)	Identified Noise Sources			
R1 Bow Hills	8:58 pm	45	7.9/139	Lapse	Wind (43), traffic (39), insects (28), NM inaudible			
R2 Ardmona	7:18 pm	49	8.9/132	Lapse	Traffic (46), birds & insects (44), wind (41), NM			
					inaudible			
R4 Oakleigh	7:41 pm	50	8.6/135	Lapse	Wind (50), traffic (27), NM inaudible			
R6 Matilda	9:26 pm	44	8.0/140	Lapse	Wind (44), insects (26), NM inaudible			
R13 Newhaven	6:35 pm	44	8.1/131	Lapse	Wind (42), birds (39), NM inaudible			
R16 Belah Park	8:21 pm	52	8.8/137	Lapse	Wind (52), NM (30)			

Table 6: NM Operational Noise Monitoring Results – 15/16 March 2016 (night)								
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources			
		Leq (15 min)	speed/direction	(°C/100m)				
R1 Bow Hills	11:59 pm	38	5.1/137	Lapse	Wind (35), traffic (34), insects (27), NM inaudible			
R2 Ardmona	11:11 pm	42	5.7/138	Lapse	Traffic (40), wind (37), insects (27), NM inaudible			
R4 Oakleigh	10:02 pm	44	6.2/142	Lapse	Insects (43), wind (35), traffic (31), NM inaudible			
R6 Matilda	11:36 pm	38	5.6/137	Lapse	Wind (36), insects (33), NM inaudible			
R13 Newhaven	1:36 am	38	5.3/135	Lapse	Insects (36), NM (16*)			
R16 Belah Park	12:22 am	45	5.1/137	Lapse	Wind (45), insects (28), NM inaudible			

*Noise from mine

Table 7: NM Operational Noise Monitoring Results – 16 March 2016 (day)							
Location	Time	Total dB(A),	Total dB(A), Wind Temp Grad		Identified Noise Sources		
		Leq (15 min)	speed/direction	(°C/100m)			
R4 Oakleigh	10:15 am	37	4.6/129	n/a	Birds (36), wind (28), traffic (25), NM inaudible		
R13 Newhaven	1:41 pm	42	5.1/148	n/a	NM (24*), birds (27), wind (26)		
R16 Belah Park	11:56 am	40	4.3/136	n/a	Wind (38), traffic (32), birds (32), NM inaudible		

*Noise from vent fan

Table 8: NM Operational Noise Monitoring Results – 16 March 2016 (evening)							
Location	Time	Total dB(A), Wind Tem		Temp Grad	Identified Noise Sources		
		Leq (15 min)	speed/direction	(°C/100m)			
R4 Oakleigh	7:50 pm	49	7.0/149	Lapse	Insects (48), wind (40), traffic (28), NM inaudible		
R13 Newhaven	9:19 pm	46	7.0/141	Lapse	NM (27*), insects (39), wind (31)		
R16 Belah Park	8:32 pm	45	7.4/137	Lapse	Wind (45), traffic (31), insects (27), NM inaudible		

*Noise from vent fan



Table 9: NM Operational Noise Monitoring Results – 16/17 March 2016 (night)							
Location	Time	Total dB(A), Wind Temp Grad Identi		Identified Noise Sources			
		Leq (15 min)	speed/direction	(°C/100m)			
R4 Oakleigh	10:08 pm	48	5.7/132	Lapse	Wind (45), insects (45), NM inaudible		
R13 Newhaven	12:37 am	44	4.5/129	Lapse	Insects (42), NM (22*), wind (28)		
R16 Belah Park	11:20 pm	45	4.6/131	Lapse	Wind (44), insects (37), traffic (25), NM inaudible		

*Noise from vent fan

Table 10: NM Sleep Disturbance Monitoring Results – 14/15 March 2016 (night)								
Location	Time	dB(A),L1 (1 min) Wind speed / direction Temp Grad (*C/100m)						
R4 Oakleigh	10:03 pm	n/a	1.7/111	Lapse				
R13 Newhaven	12:34 pm	14 ¹	2.3/156	Lapse				
R16 Belah Park	11:17 pm	32	2.7/136	Lapse				

*Noise from vent fan

Table 11: NM Sleep Disturbance Monitoring Results – 15/16 March 2016 (night)								
Location	Time	dB(A),L1 (1 min)	Wind speed / direction	Temp Grad (°C/100m)				
R1 Bow Hills	11:59 pm	n/a	5.1/137	Lapse				
R2 Ardmona	11:11 pm	n/a	5.7/138	Lapse				
R4 Oakleigh	10:02 pm	n/a	6.2/142	Lapse				
R6 Matilda	11:36 pm	n/a	5.6/137	Lapse				
R13 Newhaven	1:36 am	19 ¹	5.3/135	Lapse				
R16 Belah Park	12:22 pm	n/a	5.1/137	Lapse				

*Noise from vent fan

Table 12: NM Sleep Disturbance Monitoring Results – 16/17 March 2016 (night)							
Location	Time	Time dB(A),L1 (1 min) Wind speed / direction Temp Grad (*C/10)					
R4 Oakleigh	10:08 pm	n/a	5.7/132	Lapse			
R13 Newhaven	12:37 am	26 ¹	4.5/129	Lapse			
R16 Belah Park	11:20 am	n/a	4.6/131	Lapse			

*Noise from vent fan

Table 13: NM Noise Monitoring Results – 11 May 2016 (Day)							
Location	Time	dB(A), Leq(15min)	Wind speed(m/s)/direction	Identified Noise Sources			
R1 Bow Hills	1:54 pm	40	2.4 / 228	Traffic (39), NM (30), birds (27)			
R2 Ardmona	12:33 pm	49	0.6 / 223	Traffic (49), birds (29), NM (<20)			
R4 Oakleigh	12:07 pm	35	2.3 / 175	Birds (31), traffic (30), train (26), wind (25), NM (<20)			
R6 Matilda	1:20 pm	35	2.5 / 249	Birds (35), tractor (22), NM (<20)			
R13 Newhaven	2:47 pm	37	4.6 / 243	Wind (36), birds (27), NM (<20)			
R16 Belah Park	2:18 pm	36	3.5 / 223	Traffic (36), birds (24), NM (<20)			



Table 14: NM Noise Monitoring Results – 11 May 2016 (Evening)							
Location	Time	dB(A), Leq(15min)	Wind speed (m/s)/direction	Temp Grad (°C/100m)	Identified Noise Sources		
R1 Bow Hills	8:22 pm	45	2.0 / 226	Lapse	Traffic (44), NM (38)		
R2 Ardmona	6:52 pm	53	2.9 / 210	Lapse	Traffic (53), NM (<20)		
R4 Oakleigh	7:19 pm	28	2.7 / 209	Lapse	NM (24), traffic (23), wind (23)		
R6 Matilda	7:53 pm	21	2.1 / 223	Lapse	Insects (21), NM (<20)		
R13 Newhaven	9:16 pm	47	1.9 / 209	Lapse	NM (29)		
R16 Belah Park	8:46 pm	41	2.0 / 230	Lapse	Traffic (40), NM (33)		

Table 15: NM Noise Monitoring Results – 11/12 May 2016 (Night)									
Location	Time	dB(A), Leq(15min)	Wind speed (m/s)/direction°	Temp Grad (°C/100m)	Identified Noise Sources				
R1 Bow Hills	11:14 pm	43	1.9 / 238	Lapse	Traffic (42), NM (36)				
R2 Ardmona	10:24 pm	47	1.7 / 238	Lapse	Traffic (47), NM (<20)				
R4 Oakleigh	10:48 pm	35	2.1 / 237	Lapse	Traffic (35), NM (<20)				
R6 Matilda	10:00 pm	22	2.1 / 246	Lapse	Traffic (22), NM (<20)				
R13 Newhaven	12:09 am	47	1.5 / 296	Lapse	NM (29)				
R16 Belah Park	11:37 pm	41	2.2 / 249	Lapse	Traffic (40), NM (32)				

Table 16: L1 (1 min) – 11/12 May 2016 (Night)							
Location	Time	dB(A),L1(1 min)					
R1 Bow Hills	11:14 pm	41					
R2 Ardmona	10:24 pm	<20					
R4 Oakleigh	10:48 pm	<20					
R6 Matilda	10:00 pm	<20					
R13 Newhaven	12:09 am	33*					
R16 Belah Park	11:37 pm	38					

* - Noise from mine

During the March 2016 monitoring, under the operating and meteorological conditions at the time, for the worst case 15 minute compliance measurement periods, the mine noise was compliant at all monitoring locations at all times. During the May 2016 monitoring, under the operating and metrological conditions at the time, elevated levels were measured at the Bow Hills monitoring location however a private agreement is in place and the noise levels recorded were compliant.



Month	ND1 Turrabaa	ND2 Claremont	ND3 Bow Hills	ND4a New Matoppo	ND5 Claremont	ND6 Willarah	ND7 Claremont	ND8 Claremont	ND11 Oakleigh	ND12 Merriman
Jun-15	2.9	2.2	0.6	2.1	2.8	0.6	0.7	0.5	0.8	0.2
Jul-15	4.9	6.7	0.6	1.8	6.5	0.4	0.8	2.8	0.6	0.1
Aug-15	1.2	3.3	0.7	1.8	3.2	0.1	1.2	1.9	0.4	0.5
Sep-15	3.2	3.7	1.4	2.8	10.3	1.0	4.8	1.3	1.1	1.3
Oct-15	6.4	1.4	0.6	0.7	2.8	0.9	1.0	2.0	1.5	0.6
Nov-15	9.4	23.0	0.8	4.0	2.6	1.3	3.0	3.9	4.6	0.7
Dec-15	3.7	2.2	0.8	2.8	2.6	2.1	0.8	1.6	0.9	1.3
Jan-16	1.2	0.7	0.5	2.9	2.4	0.9	0.8	0.3	0.1	1.4
Feb-16	0.9	2.5	0.8	1.0	2.4	1.3	3.5	1.4	9.4	0.9
Mar-16	1.0	1.0	0.5	2.2	1.9	0.8	0.8	1.1	0.9	0.6
Apr-16	1.1	1.2	1.9	4.8	1.7	0.8	0.5	1.8	6.6	1.5
May-16	4.6	1.9	0.7	1.5	1.8	0.8	2.4	1.7	0.9	0.6
Annual Average	3.4	4.2	0.8	2.4	3.4	0.9	1.7	1.7	2.3	0.8

Deposited Dust Monitoring

Deposited dust levels are within compliance limits with the exception of ND2, which is due to a high level recorded in November 2015 due to nearby harvesting activities. The ash component of this dust gauge, i.e. indicative of mineral type contamination is $2.2 \text{ g/m}^2/\text{mth}$, below the annual average limit of $4 \text{ g/m}^2/\text{mth}$. All other dust gauges have remained at relatively low levels since the last meeting.

High Volume Air Sampling (PM₁₀)

 PM_{10} measurements taken to the end of May 2016 for the "Claremont" High Volume Air Sampler (HVAS) are returning a running annual average of 10.22 μ g/m³, which is well below the annual average limit of 30 μ g/m³.



 PM_{10} measurements taken to the end of May 2016 for the "Turrabaa" High Volume Air Sampler are returning a running annual average of 10.19 µg/m³, which is also well below the annual average limit of 30 µg/m³.





PM₁₀ levels have remained compliant since the last meeting.

Groundwater Monitoring

Groundwater monitoring was completed in June 2016. Nested piezometers have been installed on the "Omeo" and "Kurrajong" properties and two sets are also installed on the mine site to monitor the effects of the Longwall operation. Monitoring results are included below.
























































Monitoring well P13 water levels have stabilised with levels slightly recovering over the previous two monitoring rounds. In the area of P13 pre-drainage of water and gas commenced in February 2011 and was completed during November 2013. It is considered likely that any impacts to the standing water level would have been identified during 2011. Bore P13 is 30 m deep and targets the Garrawilla Volcanics. A production bore, WB2, is approximately 300 m to the south and targets the same aquifer and as such the drop in water level in P13 is likely associated with production from WB2.

Montoring well P15 had shown a steady decrease in water level since March 2014, during the March and June 2015 monitrong rounds it had recovered to near background levels, however the level has since decreased again and the bore is now dry. P15 is installed to 30m and is located above longwall panel (LW) 105 which has now been extracted and this is the likely cause of the water level drop. P14 is installed at the same location to 78m and it has been intermittently dry which is not attributable to mining, i.e. recorded dry in July 2012 well before development commenced in the area around P14/P15. Given the mine has gone beyond this point in LW105, the water level in P15 will likely recover in the future.

Surface Water Monitoring

No wet weather discharges or flows in surrounding creeks were sampled during the period March to May 2016.

Subsidence

Narrabri Mine has monitored the subsidence movement across the surface of LW101 to LW105 in accordance with the approved Extraction Plan. The table below outlines the maximum subsidence parameters recorded as part of the subsidence monitoring program and a comparison with the maximum predicted subsidence parameters as outlined in the Extraction Plan. Monitoring has been undertaken on the 11kv power line that traverses the southern end of LW101 to LW105.

LW101 to LW105 Predicted and Measured Subsidence Parameters						
	Maximum Predicted Extraction Plan Maximum Measured					
Line 101 – Centre of LW101						
Subsidence (m)	2.69	2.633				



LW101 to LW105 Predicted and Measured Subsidence Parameters						
	Maximum Predicted Extraction Plan	Maximum Measured				
Tilt (mm/m)	47	29.1 – 46.3				
Tensile Strain (mm/m)	12.5 – 25^	8.7 – 20.7				
Compressive Strain (mm/m)	16 – 32^	7.5 – 26.6				
Angle of Draw (°, Degrees)	22.5 - 26.5	20.2				
Line 102 – Centre of LW102						
Subsidence (m)	2.69	2.694				
Tilt (mm/m)	45	43.7				
Tensile Strain (mm/m)	11.5 – 23^	20.5				
Compressive Strain (mm/m)	15 – 30^	46.7				
Angle of Draw (°, Degrees)	22.5 – 26.5	20.8				
Line 103 North – Centre of LW103 Northe	ern End					
Subsidence (m)	2.75	2.688				
Tilt (mm/m)	34	40.2				
Tensile Strain (mm/m)	8 – 16^	18.8				
Compressive Strain (mm/m)	10 – 20^	27.9				
Angle of Draw (°, Degrees)	22.5 – 26.5	18.1				
Line 103 South - Centre of LW103 South	ern End					
Subsidence (m)	2.75	2.524				
Tilt (mm/m)	34	30.3				
Tensile Strain (mm/m)	8 – 16^	9.3				
Compressive Strain (mm/m)	10 – 20^	8.7				
Angle of Draw (°, Degrees)	22.5 – 26.5	20.2				
Line 104 North – Centre of LW104 Northe	ern End					
Subsidence (m)	2.75	2.756				
Tilt (mm/m)	34	48.4				
Tensile Strain (mm/m)	8 – 16^	42.6				
Compressive Strain (mm/m)	20 – 40^	42.3				
Angle of Draw (°, Degrees)	22.5 – 26.5	18.7				
Line 104 South - Centre of LW104 South	ern End					
Subsidence (m)	2.75	2.614				
Tilt (mm/m)	34	30.3				
Tensile Strain (mm/m)	8 – 16^	7.5				
Compressive Strain (mm/m)	20 - 40^	6.1				
Angle of Draw (°, Degrees)	22.5 - 26.5	13.2				
Line 105 North – Centre of LW105 Northe	ern End					
Subsidence (m)	2.75	2.543*				



LW101 to LW105 Predicted and Measured Subsidence Parameters						
	Maximum Predicted Extraction Plan	Maximum Measured				
Tilt (mm/m)	38	45.8*				
Tensile Strain (mm/m)	18	17.7*				
Compressive Strain (mm/m)	23	44.6*				
Angle of Draw (°, Degrees)	22.7 – 33.2	15.3*				
Line 105 South – Centre of LW105 So	uthern End					
Subsidence (m)	2.75	2.540*				
Tilt (mm/m)	38	25.0*				
Tensile Strain (mm/m)	18	6.1*				
Compressive Strain (mm/m)	23	8.6*				
Angle of Draw (°, Degrees)	22.7 - 33.2	14.4*				
Line A – Cross Panel Survey Line						
Subsidence (m)	2.75	2.655*				
Tilt (mm/m)	47	56.3*				
Tensile Strain (mm/m)	12.5 – 25^	19.1*				
Compressive Strain (mm/m)	20 - 40^	26.7*				
Angle of Draw (°, Degrees)	22.5 - 26.5	24.2*				
Line B – Pine Creek Tributary 1						
Subsidence (m)	2.75	2.589				
Tilt (mm/m)	47	54.8				
Tensile Strain (mm/m)	12.5 – 25^	13.1				
Compressive Strain (mm/m)	20-40^	11.0				
Gradient Change (%)	Up to 6	5.47				
Line D – Pine Creek						
Subsidence (m)	2.75	2.650*				
Tilt (mm/m)	47	32.9*				
Tensile Strain (mm/m)	12.5 – 25^	10.6*				
Compressive Strain (mm/m)	20 - 40^	15.0*				
Gradient Change (%)	Up to 6	3.29*				
Line E – Pine Creek Tributary 1 Cross	line 1					
Subsidence (m)	2.75	1.013				
Tilt (mm/m)	47	26.9				
Tensile Strain (mm/m)	12.5 – 25^	9.2				
Compressive Strain (mm/m)	20 - 40^	2.9				
Line F – Pine Creek Tributary 1 Cross	line 2					
Subsidence (m)	2.75	2.698				
Tilt (mm/m)	47	59.1				
Tensile Strain (mm/m)	12.5 – 25^ 6.6					



	Maximum Predicted Extraction				
	Plan	Maximum Measured			
Compressive Strain (mm/m)	20 – 40^	21.7			
Line G – Pine Creek Tributary 1 Crossline	3				
Subsidence (m)	2.75	1.388			
Tilt (mm/m)	47	28.7			
Tensile Strain (mm/m)	12.5 – 25^	10.1			
Compressive Strain (mm/m)	20 – 40^	11.4			
Electricity Transmission Lines – 11kV Pov	ver Lines				
Pole 2					
Subsidence (m)	0	0.046			
Dynamic Tilt (mm/m)	0	9.09			
Final Tilt (mm/m)	0	9.09			
Conductor length change between poles 2-3 (m)	0.13	0.56			
Conductor Clearance Loss (m)	0.77	+0.714			
Pole 3					
Subsidence (m)	2.18	2.085			
Dynamic Tilt (mm/m)	30	66.3			
Final Tilt (mm/m)	12	50.08			
Conductor length change between poles 3 - 4 (m)	0.28	-0.81			
Conductor Clearance Loss (m)	1.10	-1.517			
Pole 4					
Subsidence (m)	2.11	2.063			
Dynamic Tilt (mm/m)	25	74.23			
Final Tilt (mm/m)	15	31.80			
Conductor length change between poles 4 - 5 (m)	0.13	0.48			
Conductor Clearance Loss (m)	0.07	+1.200			
Pole 5					
Subsidence (m)	0.31	0.238			
Dynamic Tilt (mm/m)	2	25.66			
Final Tilt (mm/m)	2	19.40			
Conductor length change between poles 5 - 6 (m)	0.024	0.97			
Conductor Clearance Loss (m)	0.30	+1.842			
Pole 6					
Subsidence (m)	1.41	1.645			
Dynamic Tilt (mm/m)	27 132.483				



LW101 to LW105 Predicted and Measured Subsidence Parameters						
	Maximum Predicted Extraction Plan	Maximum Measured				
Final Tilt (mm/m)	27	129.68				
Conductor length change between poles 6 – 7 (m)	0.274	-1.029				
Conductor Clearance Loss (m)	1.30	1.010				
Pole 7						
Subsidence (m)	2.42	2.614				
Dynamic Tilt (mm/m)	3	215.912				
Final Tilt (mm/m)	3	129.68				
Conductor length change between poles 7 – (m)	0.034	-				
Conductor Clearance Loss (m)	1.71	-				

* - subsidence development incomplete.

^ - values for 'smooth' and 'discontinuous' (i.e. crack affected) subsidence profiles.

Based on the above table, subsidence prediction exceedances have occurred above LW101 to LW105:

- The maximum subsidence measurements were within +/- 10% of the predicted value of 2.75 m.
- The maximum tilt measurements were within 15% of the predicted values for the centreline lines of LW101, LW102 and LW103. >90% of the measured tilts in LW104 and LW105 were within the predicted range.
- The maximum tensile strain measurements were generally within the predicted range of the values of 11 mm/m (smooth profile) and 22 mm/m (discontinuous or crack affected profiles). >90% of the measured tensile strain values in LW104 and LW105 were within the predicted range.
- The maximum compressive strain measurements were generally within the range of the predicted values of 14 mm/m (smooth profile) and 28 mm/m (discontinuous or crack affected profiles) with the exception of: LW102, which recorded a maximum compressive strain of 46.7 mm/m; LW104, which recorded a maximum compressive strain of 42.3 mm/m; and LW105, which recorded a maximum compressive strain of 44.6 mm/m. However, 99% (LW102), 98% (LW104) and 96% (LW105) of the measured compressive strains were within the predicted range.

The centreline subsidence results for LW101 to LW105 indicate that the Garrawilla Volcanics and Basalt Sill have not reduced subsidence through spanning behaviour.

The maximum subsidence is also considered closer to 63% of the average mining height of 4.3m. The subsidence predictions have been updated as part of the latest modification for the mine and the revised values will be included in a revision to the site's Extraction Plan.

Complaints

Four formal complaints were received during the period March to May 2016. Three were in relation to dust and one was in relation to noise. The noise complaint was followed up and the complainant was advised of the noise management measures to be installed. The dust complaints were actioned at the time of the complaint with additional sprays activated and the dozers were directed to modify their operation to move away from dustier areas.

Environmental Incident(s)

No environmental incidents occurred during the March to May 2016 period.







Narrabri Mine Community Consultative Committee Meeting Minutes

Meeting No:	34
Date:	Wednesday 7 th September 2016
Time:	4:10pm
Location:	Narrabri Mine Site Office
Present:	Russell Stewart (RS) – Independent Chairman
	James Stieger (JS)
	Rodney Dunlop (RD)
	Mark Foster (MF)
	Geoff Hunter (GH)
	Ronan Kellaghan (RK) – Ramboll Environ
	Steve Bow (SB) – Narrabri Mine General Manager
	Dave Ellwood (DE) – Narrabri Mine Technical Services Superintendent
	Steve Farrar (SF) – Narrabri Mine Environmental Superintendent

1. APOLOGIES

Cathy Redding, Peter Webb

2. DECLARATION OF PECUNIARY OR OTHER INTERESTS

RD stated that he had just started working at Maules Creek Coal as a contract Environmental Coordinator.

3. PREVIOUS MINUTES

Moved: GH

Seconded: JS

GH asked if the minutes could be put out quicker.

3.1. BUSINESS ARISING FROM PREVIOUS MINUTES

Air quality information presented for the Narrabri Mine CCC by Ronan Kellaghan of Ramboll Environ.

GH asked if the PM10 travels to which RK stated the larger particles settle out closer to the source with the finer particles travelling further. RS asked if at this time of year with pollen how do you go with that. RK stated that is also measured and you would be getting some of it. RS asked if this would bugger up the results and SF stated that what you might find is a trend in spring when levels increase each year. JS asked about smoke and RK stated that smoke is mostly PM2.5, which is really really fine dust but it is a subset of PM10. RS stated the picture he has in his head is pollenblocking things and RK stated the flow rate is very important and can be adjusted to maintain the flow rate when the filter paper builds up with material. GH asked how far do think that would go [dust] and do we have an estimate and RK stated not far but likely a couple of hundred meters from a source for the larger particles and PM10 is a subset of the total and will go further. RD stated that PM10 monitoring is more monitoring for health and deposited dust is more nuisance dust like dust that gets on your clothes. GH asked when you run these for a month do you run all of them together

WHITEHAVEN COAL

and who choses when they go. RK said ideally at the start of the month but as long as you are in +/-2 days. SF stated the standard is 28 days +/- 2 days. GH asked is it a certain month every year to which SF replied they are out all the time and we sample in the middle of the month. SF said they probably do it that way because they have other sites to do and they would run out of time if they were all at the start of the month. MF asked how many we have. SF stated that we have 10 dust gauges and 2 high volume air samplers. RD asked if the limit for the deposited dust to increase by less than 2 and what this would mean in terms of the amount of dust deposited on a roof. JS said his roof is about 44 sg. and it puts a small amount in the bottom of the tank. RK said if you had a gauge near your house you could work it out as it wouldn't necessarily be 2 because that's the criteria. RD said that would mean 88grams a month for 12 months, which isn't much. JS said if the tank overflows it doesn't settle but if you have a dry period with top-ups that's when you get the most sediment in the bottom of the tank. JS said the first-flush thing is useless because the coal floats and goes into the tank. The first-flush is good for leaves. JS said he has filters and the 1 micron doesn't last long. RS stated that he has one in town and always has and it doesn't last long. JS asked RK how long he has being doing this and RK stated he doesn't do the monitoring anymore but has been doing air quality for around 12 years. JS asked if his company did the sampling and SF explained that RK is from the company that did the latest air quality assessments and that it is ALS that is the company that does the sampling. RK said he looks at the data for the assessments so he is familiar with the site but he tends to focus on the PM10 data. SB asked if the figures were nuisance dust, which RK confirmed. RD asked what the contour intervals were and RK said they are g/m²/mth but showed as an annual average. SF said when we modify our approval the model is updated and we now have 10 years of data available. SB asked what the PM10 units were and RK confirmed what they were. GH asked what the limit is and SF said the deposited dust is an annual average limit. MF asked if you have a dust storm in the middle of Australia does that affect it and DE confirmed that the dust storm from 2009 was picked up. SF stated that conditions are noted e.g. bushfire in the Pilliga. RK pointed out that the high vols run every six days so you may miss some things, GH asked who owns the monitors and who set them up? SF stated they are sampled by ALS and they have been out since 2006 so not entirely sure who put them out originally but the locations would have been chosen at the time as the mine didn't own many properties so they are close to the operation. SF also stated that only two of them are on private land. SF then stated that the two high vols are on mine-owned land but one may have been in place before purchase. JS stated that the original purchase was for Claremont and Turrabaa and SF said then the high vols were likely put there because they need power. GH asked who determines when sampling is done. SF said no that ALS decide when they are sampled but are set to the six day run. JS said you only have to be there between the six days, which SF confirmed. GH asked if ALS just send the results and we put them on the website, which SF confirmed. GH asked if we could put more out and if that was up to the mine and SF said the high vols are a bit harder because they need power but the dust gauges are simple and can be put anywhere. RS thanked RK for the presentation.

Inversion data – SF stated that Whitehaven is happy to provide the data but would not interpret in any way. SF asked who operates the website. SB said there would be a disclaimer on the use of the data.

4. GENERAL BUSINESS

DE went through the exploration program planned for the southern exploration area and how the mine will target exploration in the State Forest. DE presented a plan of the exploration activities planned in the forest. JS asked what the one outside of the lease is and DE replied a water-monitoring bore but it has been taken out of the REF [Review of Environmental Factors]. JS asked for a copy and DE said no problem once approved. MF asked if there were roads and DE said the roads will be put in expect for the one existing road, known as Scratch Road. DE said this was currently going through the State Government for approval now. DE also said the plan is to drill 16 boreholes this FY. JS asked what the blue line was on the map and DE said that is the surface mining lease. SB said there were 2-3 farmers we would like to talk too as well. SF pointed out the properties on the plan. RD asked about timing and SB explained the lead-time is significant. GH asked if we had an idea of mining down there to the east and DE said we have a rough idea where the sub-crop is and there is no coal to the east of that. GH said it might be worthwhile telling the



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landholders that and SB said we will talk with some people as well. DE said we need the data in the western portion to determine drilling on the neighbouring people. JS asked if the mine could put holes already drilled on the map. DE said we know the coal seam splits and this is part of it. JS asked about a fault down there and SB said there's a line on a plan but unsure where it comes from. RD asked when it was first granted as an exploration licence and SF stated 2004 and renewed every 5 years. GH asked if you cement the holes and SB said yes and you may do a gas test or permeability test but you grout them back up for rehab.

4.1. OPERATIONS PROGRESS REPORT

The operations update was provided as follows:

Mine P

Progress Report (to 3	i August 2016)	
Coal produced (t):	August 2016	825,247
	FY-to-date	1,530,597
Coal Railed (t):	August 2016	660,152
	FY-to-date	1,319,060
Average workforce nu	umbers (August 2016):	
	NCO	Waged – 154
		Salary – 113
		Total – 267
	Contractors	Total – 105
Safety Update (FY to	August 2016):	
	Lost Time Injury (LTI)	0
	Days LTI Free:	91
	Total Recordable Injuries:	2
	Planned Task Observations:	1,396
	Take 5 Assessments:	16,294

SB went through the operations report. SB said employment and safety has been steady. SB said the upgrade program continues but wet weather has meant some delays. GH asked about the wet weather and how that affects the underground and SB said its work on the surface such as the switchyard and substation work was slow. SB said the new longwall equipment is on its way from Germany and China but most is still on a boat. SB said the target for the FY was 8.2Mt. SB said he is expecting the equipment in December with power up in January. GH asked if this is a new longwall and SB said this is the extension of the existing longwall by a hundred meters. GH asked is this why the power upgrade as well and SB said yes but it is also to allow us to get 66kv from the line as we only get around 61kv now. RD asked if the methane was good enough and SB said we have none there. SB said the power supply upgrade will be a more robust system.

Work Hours (Aug-16):

SB said all of our dams are full and we are aiming to upgrade our RO plant. RS asked what was the size of the RO and SB replied 1.4ML/day, which isn't enough, and we consume more than that. RD asked if the brine goes in the pit and SB said no its used on the stockpiles. SB said the RO plant will take 4-5 months to come onsite. GH asked what we are doing with the water and SB said using it but we don't need any more rain. SB said we are lining another dam but the rain has been

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frustrating that. JS said this goes back to day one when he thought capacity wasn't enough for the mine when this place gets wet. SF said we are not talking about the mine water but water from the sediment dams. JS said it has already happened once and SB said it may happen but it will primarily be rainwater. SB said the RO plant will be upgraded and then we will have to do another one again aiming for 3.5ML/day and then sending some back to the Namoi River or local farmers as we will be in surplus at some stage. JS said when the country gets wet a mil of rain will just runoff and SB said we are at that point now. GH asked about water that is more polluted than others such as the water off of the coal and how that is managed and SF said that water is contained onsite and we are moving some of that around now. JS said the problem is we've hit the storm season and we are not ready for it.

4.2. ENVIRONMENTAL OVERVIEW

SF went through the environmental report. GH asked about Merriman and noise and SB said we have bought that but we are having some issues at Oakleigh and we are on the cusp. GH asked what we do to make them happy and SB said not sure. JS said there's a history there as well with trees and things but before SB's time. DE said the tree wall is not good but they have said they don't want us to have another crack at it. SB said there were no complaints until June last year but if we are having an impact we'll go through the process.

GH asked about the high results for ND1 and ND2 and SF said they relate to one off high results with the ND2 result relating to agricultural activities. GH asked about the PM10 graph and the high result and SF said it is an older result from 2009. GH asked if ND5 is closer to the mine than ND2, which SF confirmed. SF stated that ND2 is close to a gravel road, which isn't ideal, and ND5 is between our reject emplacement area and the stockpiles and would be a good indicator of dust settling close to the source. GH asked how the CCC would know if we had a discharge, do we just tell them at the next meeting to which SF replied we have to let the EPA know and it goes on the website in our monthly reports. RS asked about subsidence and the recent weather and DE said the soils move 40-50mm without subsidence.

RD asked if mine noise was detected in the monitoring, which SF confirmed, and then SF summarised the alarms from the noise unit. MF asked if the alarm goes off here or over there and SF said it alarms to the CHPP and then they follow a TARP that outlines actions to take. GH asked about the dust complaints and SB said it is visible dust. JS said there was history on that too and SB said if there's an issue we'll do something about it.

GH asked if we could look at the subsidence next time. SB said that will be fine. RD asked about subsidence ponding and SF stated that OEH were onsite recently, one of the regulators, and the general aim is to allow them to fill and overflow downstream and then we'll pump them out. SF said it is a little more trickier where there are no other panels downstream.

5. NEW BUSINESS

GH asked the committee to consider a letter he had prepared that would be from the committee about dust monitoring. GH said he believes there should be some regional independent monitoring done to support the Narrabri and Gunnedah Council's. SB said he is not across all of this but it is topical and that it is not supported by the mine mainly due to cost. SB said Whitehaven would bare the majority of the costs, which is in the millions whereas in the Hunter Valley it is shared. SB stated that all the data we have is out in the public, it is independently regulated, we foot the bill, and we don't mind. SB said if we are non-compliant then we treat it. SB said his understanding was that it is not pushed because of the limited value it provides. GH said from a community concern perspective they keep talking about a 50 cent piece and we will be the dinner plate up here and with new mines such as Vickery that dust worries him and he thinks we need to do it better. RS asked if the committee could reword the letter as he has an issue with making industry continually pay for things outside of what the regulation say they should and gave an example of small business being required to pay for additional car parks. RS asked is there a way the committee can support or if they want to do it then let them do it, without hanging the cost on the mines. GH said well someone has to pay such as the tax payer and SB said there are already a lot of hands in the pocket such

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as resource for regions so how about we go to Council and ask for some of that to be used for this. SB stated that if you want to spend this money then you want to see a return on investment and the Hunter Valley spend this money but it doesn't solve the problem or answer a question but there may be a few feel goods in there. RS asked what % of profits do we pay the state Government and SB said that 9.2% of revenue goes to the Government and that includes Resource for Regions. SB said you also make a contribution to Councils as we are big business and have impacts and he doesn't mind that. SB said it does keep going on and people need to be honest about the cost of these systems. RD asked what the cost of the current air quality system was and SB said he wasn't sure. SB said in terms of the data people are smelling something sinister and that's why there disappointed in the Hunter Valley because you get the data so there must be something else going on. SB stated that we have an impact but it isn't diabolical. GH asked what the other members thought and JS said he didn't think Whitehaven should have to pay for it. JS said he attended a meeting for it with the EPA and it was going to be a million dollars to run and that the baseline is already stuffed and to put them out now would be a lot of money for not much value. GH asked JS if he thinks we should do anything and JS said the Government said they were going to do the baseline independently of the mines but never have. SB said that there are shades of grey and maybe there is something sensible in the middle as the open cuts create more dust. SF said the EPA did an audit of our monitoring to see if it could fit in their system and then it went to the EPA requesting information from the mines with automatic units but not sure if that is up and running and then it comes down to the independence of the data. JS said the Government was going to do it but it was just never done and it's not Whitehaven's problem. RD stated that tax payers pay for the Office of Water to monitor irrigators and then JS stated that the EPA are already payed for by the tax payer and they're not doing their job. RS said we are already paying for them so if they want their own data they should pay for it. JS said they wanted another meeting after that but they said just do it we don't need another meeting and nothing has happened in 5 years. GH asked MF what he thought and MF said he thinks the mine pays for enough. JS said it's not that it shouldn't be done and GH asked if tax payers should pay and JS said yes out of the royalties. RS said you may pick up other data not related to mining. SB said he will get a proper response from where Whitehaven sits at the moment. SB said he could get someone at the next meeting to explain things better for Whitehaven. GH said he would be interested in hearing why things aren't working in the Hunter Valley as his understanding was that there was a lot of public pressure put on for monitoring which they got. SB said his understanding was that the community may be happy with it but it doesn't give you the scientific basis or add any value in what is going on down there. SB said his take on is it's all about dollars and cents but he'll get some more info.

DE went through a planned application for an exploration licence to the north-west of the current mine and talked to a plan. DE stated it hadn't been applied for yet and we are still going through the process but in order to keep the committee updated the info is being presented. DE said we haven't talked with any landholders as yet as we are still developing the application but we will have to advertise in the paper when applied for but the mine intends to meet with landholders prior to this. GH asked about the coal and DE said there a couple of Government boreholes but limited data available. RS asked if Santos have any data that could be useful. SF said they target seams lower than ours so they may have thickness but no quality data. SB said we are hoping to put the application in and then it is up to the Government to decide if they'll give it to us or go to public tender but they have the same information we have. SB said if it did get allocated to us we would look to explore over the next couple of years. GH asked if it got going does it come from the existing area which DE confirmed. DE stated that if you had to build another mine to access this area it wouldn't be economical. DE stated that there were a few unknowns in the process as it is new for the Government as well but we'll see how we go. GH asked how many acres it was and DE said it was about 3,700ha.

MF asked how the coal price was going and SB said it has risen from \$52US/t to \$68US/t in the last two months. MF asked about production costs and SB said we were around \$60/t on the boat. MF asked about the open cuts and SB said they are more expensive than us. MF asked where do you draw the line and start winding down and SB said they have done some cutting back at a couple of other Whitehaven sites. MF asked if we had forward contracts and SB said with the JV's we do but it is based off of the Newcastle price so if it goes down it hurts but we get exposure to the uplift and the last couple of months have been good.



6. NEXT MEETING

Wednesday 14th December 2016 at 3:00pm for site tour then meeting at 4:00pm at the Railway Hotel, Baan Baa. JS asked to ring the week before to confirm numbers.

7. CLOSURE OF MEETING

Meeting closed at 6:17pm.



Narrabri Mine Community Consultative Committee Meeting #34

Environmental Monitoring Report: June – August 2016

Noise Monitoring

Attended noise monitoring was undertaken between Tuesday 14th to Thursday 16th June 2016 (Tables 1-12), on Tuesday 5th July 2016 (Tables 13-16), and on Thursday 18th August 2016 (Tables 17-20) to verify if noise levels were within compliance limits. The results from this monitoring are detailed in the tables below.

Table 1: NM Operational Noise Monitoring Results – 14 June 2016 (day)					
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources
		Leq (15 min)	speed/direction	(°C/100m)	
R4 Oakleigh	12:55 pm	33	3.6/140	n/a	Wind (30), birds (29), traffic (24), NM inaudible
R13 Newhaven	4:50 pm	35	1.9/154	n/a	Birds (34), NM (10*), birds (26)
R16 Belah Park	2:39 pm	34	3.2/142	n/a	Traffic (32), birds (29), NM inaudible

*Noise from drilling activity nearby monitoring location

Table 2: NM Operational Noise Monitoring Results – 14 June 2016 (evening)					
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources
		Leq (15 min)	speed/direction	(°C/100m)	
R4 Oakleigh	8:29 pm	31	2.5/155	+4.8	Traffic (31), NM inaudible
R13 Newhaven	7:41 pm	38	3.0/162	+3.8	NM (20*), traffic (24)
R16 Belah Park	9:13 pm	35	2.1/133	+3.4	Traffic (35), NM (24)

*Noise from drilling activity nearby monitoring location

Table 3: NM Operational Noise Monitoring Results – 14/15 June 2016 (Night)						
Location	Time	Total dB(A), Leq (15 min)	Wind speed/direction	Temp Grad (°C/100m)	Identified Noise Sources	
R4 Oakleigh	10:00 pm	41	2.4/149	+3.2	Traffic (41), NM inaudible	
R13 Newhaven	12:26 am	39	3.0/161	+3.6	NM (21*), traffic (26)	
R16 Belah Park	11:12 pm	43	3.2/157	+3.2	Traffic (43), NM (28)	

*Noise from drilling activity nearby monitoring location

Table 4: NM Operational Noise Monitoring Results – 15 June 2016 (day)						
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources	
		Leq (15 min)	speed/direction	(°C/100m)		
R1 Bow Hills	8:50 am	47	4.0/144	n/a	Traffic (47), birds (29), NM inaudible	
R2 Ardmona	9:43 am	48	3.7/146	n/a	Traffic (48), birds (33), NM inaudible	
R4 Oakleigh	10:08 am	33	3.2/142	n/a	Traffic (31), birds (29), NM inaudible	
R6 Matilda	9:14 am	44	4.0/144	n/a	Birds (44), traffic (31), NM (26)	
R13 Newhaven	1:34 pm	35	2.9/144	n/a	Wind (35), NM (6*)	
R16 Belah Park	11:50 am	42	3.0/145	n/a	Traffic (42), birds (30), NM inaudible	

*Noise from drilling activity nearby monitoring location



Table 5: NM Operational Noise Monitoring Results – 15 June 2016 (evening)					
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources
		Leq (15 min)	speed/direction	(°C/100m)	
R1 Bow Hills	7:15 pm	47	0.6/145	+2.0	Traffic (47), NM inaudible
R2 Ardmona	8:06 pm	51	1.5/185	+2.6	Traffic (51), NM inaudible
R4 Oakleigh	8:30 pm	37	1.6/160	+2.4	Traffic (37), NM inaudible
R6 Matilda	7:40 pm	47	1.0/179	+2.8	Birds (47), traffic (29), NM inaudible
R13 Newhaven	6:33 pm	32	2.3/174	+3.4	NM (13*), traffic (26)
R16 Belah Park	9:12 pm	43	0.8/172	+3.2	Traffic (43), NM inaudible

*Noise from drilling activity nearby monitoring location

Table 6: NM Operational Noise Monitoring Results – 15/16 June 2016 (night)								
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources			
		Leq (15 min)	speed/direction	(°C/100m)				
R1 Bow Hills	10:26 pm	45	2.6/160	+3.6	Traffic (45), NM (25)			
R2 Ardmona	10:47 pm	41	2.4/166	+4.6	Traffic (41), NM inaudible			
R4 Oakleigh	11:11 pm	31	3.0/171	+4.2	Traffic (31), NM inaudible			
R6 Matilda	10:01 pm	47	1.5/171	+3.8	Birds (47), NM (21)			
R13 Newhaven	1:37 am	34	2.7/156	+3.6	Wind (32), NM (12*)			
R16 Belah Park	12:23 am	28	1.6/179	+2.4	NM (28)			

*Noise from drilling activity nearby monitoring location

Table 7: NM Operational Noise Monitoring Results – 16 June 2016 (day)								
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources			
		Leq (15 min)	speed/direction	(°C/100m)				
R4 Oakleigh	10:40 am	32	2.3/340	n/a	NM (28), traffic (28), birds (24)			
R13 Newhaven	12:29 pm	34	3.6/329	n/a	NM (15*), wind (26), birds (24)			
R16 Belah Park	9:07 am	40	1.8/150	n/a	Traffic (40), birds (28), NM inaudible			

*Noise from drilling activity nearby monitoring location

Table 8: NM Operational Noise Monitoring Results – 16 June 2016 (evening)								
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources			
		Leq (15 min)	speed/direction	(°C/100m)				
R4 Oakleigh	8:23 pm	36	0.4/NW	+2.4	Traffic (35), NM (29)			
R13 Newhaven	7:37 pm	29	0.4/NW	+3.4	NM (8*), traffic (25)			
R16 Belah Park	9:19 pm	42	0.4/NW	+1.2	Traffic (42), NM (22)			

*Noise from drilling activity nearby monitoring location

Table 9: NM Operational Noise Monitoring Results – 16/17 June 2016 (night)								
Location	Time	Total dB(A), Leq (15 min)	Wind speed/direction	Temp Grad (°C/100m)	Identified Noise Sources			
R4 Oakleigh	10:03 pm	41	0.4/NW	+3.0	Traffic (40), NM (33)			
R13 Newhaven	12:30 am	25	0.1/NW	+4.6	Traffic (25), NM inaudible			



	R16 Belah Park	11:16 pm	38	0.2/NW	+4.2	Traffic (38), NM (22)
1						

*Noise from drilling activity nearby monitoring location

Table 10: NM Sleep Disturbance Monitoring Results – 14/15 June 2016 (night)								
Location	Time dB(A),L1 (1 min) Wind speed / direction Temp Grad (*C/100m)							
R4 Oakleigh	10:00 pm	n/a	2.4/149	+3.2				
R13 Newhaven	12:26 am	24*	3.0/161	+3.6				
R16 Belah Park	11:12 pm	32	3.2/157	+3.2				

*Noise from drilling activity nearby monitoring location

Table 11: NM Sleep Disturbance Monitoring Results – 15/16 June 2016 (night)									
Location	Time	dB(A),L1 (1 min)	Wind speed / direction	Temp Grad (°C/100m)					
R1 Bow Hills	10:26 pm	30	2.6/160	+3.6					
R2 Ardmona	10:47 pm	n/a	2.4/166	+4.6					
R4 Oakleigh	11:11 pm	n/a	3.0/171	+4.2					
R6 Matilda	10:01 pm	23	1.5/171	+3.8					
R13 Newhaven	1:37 am	15*	2.7/156	+3.6					
R16 Belah Park	12:23 am	33	1.6/179	+2.4					

*Noise from drilling activity nearby monitoring location

Table 12: NM Sleep Disturbance Monitoring Results – 16/17 June 2016 (night)								
Location	Time dB(A),L1 (1 min) Wind speed / direction Temp Grad (*C/100							
R4 Oakleigh	10:03 pm	37	0.4/NW	+3.0				
R13 Newhaven	12:30 am	n/a	0.1/NW	+4.6				
R16 Belah Park	11:16 pm	25	0.2/NW	+4.2				

Table 13: NM Noise Monitoring Results – 5 July 2016 (Day)								
Location	Time	dB(A), Leq(15min)	Wind speed(m/s)/direction	Identified Noise Sources				
R1 Bow Hills	1:01 pm	49	6.6 / 291	Traffic (48), wind (40), birds (28), NCM (25)				
R2 Ardmona	12:11 pm	51	6.1 / 291	Traffic (50), wind (43), birds (31), NCM (<20)				
R4 Oakleigh	12:37 pm	48	6.8 / 292	Wind (48), NCM (<20)				
R6 Matilda*	11:47 pm	45	4.8 / 284	Wind (45), NCM (<20)				
R13 Newhaven	1:53 pm	38	5.4 / 298	NCM (19)**, wind (30), birds (24)				
R16 Belah Park	1:25 pm	51	6.0 / 290	Wind (50), traffic (43), NCM (<20)				

*Measurement conducted at front gate due to absent resident

**Noise from drilling activity nearby monitoring location

Table 14: NM Noise Monitoring Results – 5 July 2016 (Evening)								
Location	Time	dB(A), Leq(15min)	Wind speed (m/s)/direction	Temp Grad (°C/100m)	Identified Noise Sources			
R1 Bow Hills	8:24 pm	45	4.4 / 298	+0.4	Traffic (42), NCM (42), frogs (28)			
R2 Ardmona	7:36 pm	50	5.1 / 298	Lapse	Traffic (50), wind (35), NCM (32)			



R4 Oakleigh	8:00 pm	40	5.0 / 298	Lapse	Wind (38), NCM (33), traffic (30)
R6 Matilda*	7:14 pm	39	5.0 / 299	Lapse	Wind (38), NCM (29), traffic (25)
R13 Newhaven	9:14 pm	49	3.2 / 282	Lapse	NCM (31)**
R16 Belah Park	8:47 pm	45	3.5 / 289	+0.6	Traffic (45), NCM (32)

*Measurement conducted at front gate due to absent resident **Noise from drilling activity nearby monitoring location

Table 15: NM Noise Monitoring Results – 5/6 July 2016 (Night)								
Location	Time	dB(A), Leq(15min)	Wind speed (m/s)/direction°	Temp Grad (°C/100m)	Identified Noise Sources			
R1 Bow Hills	11:16 pm	48	3.1 / 298	Lapse	Traffic (46), NCM (44), frogs (26)			
R2 Ardmona	10:23 pm	48	3.1 / 292	Lapse	Traffic (48), NCM (31)			
R4 Oakleigh	10:48 pm	33	2.8 / 293	Lapse	NCM (33)			
R6 Matilda*	10:00 pm	33	4.0 / 274	Lapse	Wind (32), NCM (26)			
R13 Newhaven	12:14 am	40	3.5 / 291	Lapse	NCM (22)**			
R16 Belah Park	11:39 pm	44	3.1 / 290	Lapse	Traffic (44), NCM (32)			

*Measurement conducted at front gate due to absent resident **Noise from drilling activity nearby monitoring location

Table 16: L1 (1 min) – 5/6 July 2016 (Night)				
Location	Time	dB(A),L1(1 min)		
R1 Bow Hills	11:16 pm	50		
R2 Ardmona	10:23 pm	36		
R4 Oakleigh	10:48 pm	37		
R6 Matilda*	10:00 pm	29		
R13 Newhaven	12:14 am	28**		
R16 Belah Park	11:39 pm	36		

*Measurement conducted at front gate due to absent resident **Noise from drilling activity nearby monitoring location

Table 17: NM Noise Monitoring Results – 18 August 2016 (Day)					
Location	Time	dB(A), Leq(15min)	Wind speed(m/s)/direction	Identified Noise Sources	
R1 Bow Hills	4:30 pm	34	0.9 / 139	Traffic (33), birds (26), NCM (<20)	
R2 Ardmona	3:23 pm	47	1.5 / 171	Traffic (47), birds (30), NCM (<20)	
R4 Oakleigh	3:15 pm	35	1.8 / 171	Traffic (33), NCM (29), birds (20)	
R6 Matilda	4:01 pm	30	1.2 / 157	Birds (29), traffic (22), NCM (20)	
R13 Newhaven	5:25 pm	42	1.0 / 34	NCM (24)*	
R16 Belah Park	4:52 pm	41	0.9 / 132	Traffic (41), birds (29), NCM (<20)	

*Noise from water pump nearby monitoring location



Table 18: NM Noise Monitoring Results – 18 August 2016 (Evening)						
Location	Time	dB(A), Leq(15min)	Wind speed (m/s)/direction	Temp Grad (°C/100m)	Identified Noise Sources	
R1 Bow Hills	8:04 pm	48	1.4 / 9	+7.2	Traffic (47), frogs (41), NCM (<20)	
R2 Ardmona	8:27 pm	50	1.0 / 11	+8.8	Traffic (50), frogs (27), NCM (<20)	
R4 Oakleigh	9:11 pm	39	1.1 / 21	+6.6	Traffic (38), NCM (29), frogs (22)	
R6 Matilda	8:56 pm	32	1.5 / 19	+9.4	Traffic (28), frogs (28), NCM (25)	
R13 Newhaven	9:27 pm	44	1.3 / 35	+9.2	NCM (26)*	
R16 Belah Park	7:40 pm	44	1.2 / 13	+6.8	Traffic (44), frogs (27), NCM (<20)	

*Noise from water pump nearby monitoring location

Table 19: NM Noise Monitoring Results – 18/19 August 2016 (Night)						
Location	Time	dB(A), Leq(15min)	Wind speed (m/s)/direction°	Temp Grad (°C/100m)	Identified Noise Sources	
R1 Bow Hills	11:04 pm	45	2.1/32	+5.2	Traffic (44), frogs (39), NCM (<20)	
R2 Ardmona	10:42 pm	49	1.7 / 39	+8.2	Traffic (49), frogs (26), NCM (<20)	
R4 Oakleigh	10:17 pm	35	1.8 / 25	+7.4	NCM (33), traffic (31), frogs (23)	
R6 Matilda	10:15 pm	33	1.8 / 25	+7.4	NCM (29), frogs (29), traffic (26)	
R13 Newhaven	11:55 pm	44	1.4 / 20	+8.0	NCM (26)*	
R16 Belah Park	11:27 pm	32	1.6 / 19	+7.8	Traffic (28), frogs (28), NCM (24)	

*Noise from water pump nearby monitoring location

Table 20: L1 (1 min) – 18/19 August 2016 (Night)				
Location	Time	dB(A),L1(1 min)		
R1 Bow Hills	11:04 pm	<20		
R2 Ardmona	10:42 pm	<20		
R4 Oakleigh	10:17 pm	37		
R6 Matilda	10:15 pm	33		
R13 Newhaven	11:55 pm	28*		
R16 Belah Park	11:27 pm	28		

*Noise from water pump nearby monitoring location

During the June and August 2016 monitoring, under the operating and meteorological conditions at the time, for the worst case 15 minute compliance measurement periods, the mine noise was compliant at all monitoring locations at all times. During the July 2016 monitoring, under the operating and metrological conditions at the time, elevated levels were measured at the Bow Hills monitoring location however a private agreement is in place and the noise levels recorded were compliant.



Deposited Dust Monitoring

Month	ND1 Turrabaa	ND2 Claremont	ND3 Bow Hills	ND4a New Matoppo	ND5 Claremont	ND6 Willarah	ND7 Claremont	ND8 Claremont	ND11 Oakleigh	ND12 Merriman
Sep-15	3.2	3.7	1.4	2.8	10.3	1.0	4.8	1.3	1.1	1.3
Oct-15	6.4	1.4	0.6	0.7	2.8	0.9	1.0	2.0	1.5	0.6
Nov-15	9.4	23.0	0.8	4.0	2.6	1.3	3.0	3.9	4.6	0.7
Dec-15	3.7	2.2	0.8	2.8	2.6	2.1	0.8	1.6	0.9	1.3
Jan-16	1.2	0.7	0.5	2.9	2.4	0.9	0.8	0.3	0.1	1.4
Feb-16	0.9	2.5	0.8	1.0	2.4	1.3	3.5	1.4	9.4	0.9
Mar-16	1.0	1.0	0.5	2.2	1.9	0.8	0.8	1.1	0.9	0.6
Apr-16	1.1	1.2	1.9	4.8	1.7	0.8	0.5	1.8	6.6	1.5
May-16	4.6	1.9	0.7	1.5	1.8	0.8	2.4	1.7	0.9	0.6
Jun-16	1.2	2.8	0.3	1.0	2.2	0.4	1.1	0.5	4.6	0.6
Jul-16	2.5	0.3	0.1	0.3	2.4	0.2	3.4	0.2	0.1	0.3
Aug-16	1.2	1.8	0.6	0.6	1.3	0.2	5.5	1.3	0.5	0.7
Annual Average	3.0	3.5	0.8	2.1	2.9	0.9	2.3	1.4	2.6	0.9

All deposited dust levels are within the compliance limit of 4 g/m²/mth.

High Volume Air Sampling (PM₁₀)

 PM_{10} measurements taken to the end of July 2016 for the "Claremont" High Volume Air Sampler (HVAS) are returning a running annual average of 10.22 μ g/m³, which is well below the annual average limit of 30 μ g/m³.



 PM_{10} measurements taken to the end of July 2016 for the "Turrabaa" High Volume Air Sampler are returning a running annual average of 9.83 µg/m³, which is also well below the annual average limit of 30 µg/m³.





 $\ensuremath{\text{PM}_{10}}$ levels have remained compliant since the last meeting.

Groundwater Monitoring

Groundwater monitoring was completed in June 2016. Monitoring results are included below.























































Monitoring well P13 water levels have stabilised with levels slightly recovering over the previous two monitoring rounds. In the area of P13 pre-drainage of water and gas commenced in February 2011 and was completed during November 2013. It is considered likely that any impacts to the standing water level would have been identified during 2011. Bore P13 is 30 m deep and targets the Garrawilla Volcanics. A production bore, WB2, is approximately 300 m to the south and targets the same aquifer and as such the drop in water level in P13 is likely associated with production from WB2.

Montoring well P15 had shown a steady decrease in water level since March 2014, during the March and June 2015 monitrong rounds it had recovered to near background levels, however the level has since decreased again and the bore is now dry. P15 is installed to 30m and is located above longwall panel (LW) 105 which has now been extracted and this is the likely cause of the water level drop. P14 is installed at the same location to 78m and it has been intermittently dry which is not attributable to mining, i.e. recorded dry in July 2012 well before development commenced in the area around P14/P15. Given the mine has gone beyond this point in LW105, the water level in P15 will likely recover in the future.

Surface Water Monitoring

No wet weather discharges from licensed discharge points occurred during the June to August 2016. For the same period, the surrounding creeks were sampled on seven occasions: 20^{th} and 24^{th} June; 5^{th} and 21^{st} July; and 3^{rd} , 23^{rd} and 25^{th} August 2016.

Subsidence

Narrabri Mine has monitored the subsidence movement across the surface of LW101 to LW105 in accordance with the approved Extraction Plan. The table below outlines the maximum subsidence parameters recorded as part of the subsidence monitoring program and a comparison with the maximum predicted subsidence parameters as outlined in the Extraction Plan. Monitoring has been undertaken on the 11kv power line that traverses the southern end of LW101 to LW105.



Longwall Panels (LW) 101 to LW	105	
	Maximum Predicted Extraction Plan	Maximum Measured
Line 101 – Centre of LW101		
Subsidence (m)	2.69	2.633
Tilt (mm/m)	47	29.1 – 46.3
Tensile Strain (mm/m)	12.5 – 25^	8.7 – 20.7
Compressive Strain (mm/m)	16 – 32^	7.5 – 26.6
Angle of Draw (°, Degrees)	22.5 – 26.5	20.2
Line 102 – Centre of LW102		
Subsidence (m)	2.69	2.694
Tilt (mm/m)	45	43.7
Tensile Strain (mm/m)	11.5 – 23^	20.5
Compressive Strain (mm/m)	15 – 30^	46.7
Angle of Draw (°, Degrees)	22.5 – 26.5	20.8
Line 103 – Centre of LW103 – Nort	thern	
Subsidence (m)	2.75	2.729
Tilt (mm/m)	34	40.2
Tensile Strain (mm/m)	8 - 16^	18.8
Compressive Strain (mm/m)	10 – 20^	27.9
Angle of Draw (°, Degrees)	22.5 – 26.5	18.1
Line 103 – Centre of LW103 – Sou	thern	
Subsidence (m)	2.75	2.575
Tilt (mm/m)	34	30.3
Tensile Strain (mm/m)	8 - 16^	9.3
Compressive Strain (mm/m)	10 – 20^	9.6
Angle of Draw (°, Degrees)	22.5 – 26.5	22.8
Line 104 – Centre of LW104 – Nor	thern	
Subsidence (m)	2.75	2.794
Tilt (mm/m)	34	48.4
Tensile Strain (mm/m)	8 - 16^	42.6
Compressive Strain (mm/m)	20 - 40^	42.3
Angle of Draw (°, Degrees)	22.5 – 26.5	18.7
Line 104 – Centre of LW104 – Sou	thern	
Subsidence (m)	2.75	2.690
Tilt (mm/m)	34	31.2
Tensile Strain (mm/m)	8 – 16^	8.1
Compressive Strain (mm/m)	20 - 40^	6.7
Angle of Draw (°, Degrees)	22.5 - 26.5	13.2
Line 105 – Centre of LW105 – Nor	thern	
Subsidence (m)	2.75	2.663



Longwall Panels (LW) 101 to LW105						
	Maximum Predicted Extraction Plan	Maximum Measured				
Tilt (mm/m)	30	46.3				
Tensile Strain (mm/m)	6.5 – 13	17.7				
Compressive Strain (mm/m)	17 – 34	44.6				
Angle of Draw (°, Degrees)	22.5 – 26.5	17.9				
Line 105 – Centre of LW105 – South	ern					
Subsidence (m)	2.75	2.614				
Tilt (mm/m)	30	30.3				
Tensile Strain (mm/m)	6.5 – 13	7.5				
Compressive Strain (mm/m)	17 – 34	6.1				
Angle of Draw (°, Degrees)	22.5 - 26.5	14.4				
Line A – Cross Panel Survey Line						
Subsidence (m)	2.75	2.655*				
Tilt (mm/m)	47	56.3*				
Tensile Strain (mm/m)	12.5 – 25^	19.1*				
Compressive Strain (mm/m)	20 - 40^	26.7*				
Angle of Draw (°, Degrees)	22.5 - 26.5	24.2*				
Line B – Pine Creek Tributary 1						
Subsidence (m)	2.75	2.589				
Tilt (mm/m)	47	54.8				
Tensile Strain (mm/m)	12.5 – 25^	13.1				
Compressive Strain (mm/m)	20 - 40^	11.0				
Gradient Change (%)	Up to 6	5.47				
Line D – Pine Creek						
Subsidence (m)	2.75	2.809*				
Tilt (mm/m)	47	45.5*				
Tensile Strain (mm/m)	12.5 – 25^	10.7*				
Compressive Strain (mm/m)	20 – 40^	15.2*				
Gradient Change (%)	Up to 6	4.54*				
Line E – Pine Creek Tributary 1 Cros	sline 1					
Subsidence (m)	2.44	1.013				
Tilt (mm/m)	47	26.9				
Tensile Strain (mm/m)	11 – 22^	9.2				
Compressive Strain (mm/m)	14 – 28^	2.9				
Line F – Pine Creek Tributary 1 Cros	sline 2					
Subsidence (m)	2.75	2.698				
Tilt (mm/m)	47	59.1				
Tensile Strain (mm/m)	12.5 – 25^	6.6				
Compressive Strain (mm/m)	20 - 40^	22.5				



Longwall Panels (LW) 101 to LW105					
	Maximum Predicted Extraction Plan Maximum Measured				
Line G – Pine Creek Tributary 1 Crossline 3					
Subsidence (m)	2.75	1.419			
Tilt (mm/m)	47	29.2			
Tensile Strain (mm/m)	12.5 – 25^	12.0			
Compressive Strain (mm/m)	20 - 40^	11.9			

* - subsidence development incomplete.

^ - values for 'smooth' and 'discontinuous' (i.e. crack affected) subsidence profiles.

Based on the above table the subsidence predictions for the most recent complete longwall panel, i.e. LW105, indicate:

- The maximum subsidence measurements for the northern and southern monitoring lines in LW105 were within the predicted value of 2.75 m with a maximum measured value of 2.663 m.
- The maximum tilt measurements recorded for LW105 exceeded the maximum predicted value of 30 mm/m. However, 97% of all values were within the predicted range.
- The maximum tensile strain measurements for LW105 exceeded the range of predicted values of 6.5 mm/m (smooth profile) and 13 mm/m (discontinuous or crack affected profiles). However, 98% of the recorded values were within the predicted range.
- The maximum compressive strain measurements for LW105 exceeded the range of the predicted values of 17 mm/m (smooth profile) and 34 mm/m (discontinuous or crack affected profiles). However, 99% of the recorded values were within the predicted range.

The centreline subsidence results for LW101 to LW105 indicate that the Garrawilla Volcanics and Basalt Sill have not reduced subsidence through spanning behaviour.

The maximum subsidence is also considered closer to 63% of the average mining height of 4.3m. The subsidence predictions have been updated as part of the latest modification and are included in the above table.

Complaints

Ten formal complaints were received during the period June to August 2016. Four were in relation to dust and six were in relation to noise. The dust complaints were actioned at the time of the complaint with additional sprays activated or the tripper moved to the fixed chutes. The noise complaints were followed up and additional monitoring at the complainant's residence has been undertaken over July/August with no issues identified.

Environmental Incident(s)

No environmental incidents occurred during the June to August 2016 period.






Narrabri Mine Community Consultative Committee Meeting Minutes

Meeting No:	35						
Date:	Wednesday 14 th December 2016						
Time:	3:00pm (Site Tour), 4:10pm Meeting						
Location:	Site tour followed by meeting at the Railway Hotel, Baan Baa						
Present:	Russell Stewart (RS) – Independent Chairman						
	James Stieger (JS)						
	Rodney Dunlop (RD)						
	Peter Webb (PW)						
	Ron Campbell (RC) – Narrabri Shire Council Representative						
	Steve Bow (SB) – Narrabri Mine General Manager						
	Dave Ellwood (DE) – Narrabri Mine Technical Services Superintendent						
	Steve Farrar (SF) – Narrabri Mine Environmental Superintendent						
	Lexie Frankham (LH) – Whitehaven Environmental Superintendent (Operations)						

1. APOLOGIES

Geoff Hunter, Mark Foster and Kirsten Gollogly

2. DECLARATION OF PECUNIARY OR OTHER INTERESTS

RC declared one of his businesses contracts to Narrabri Mine.

3. PREVIOUS MINUTES

Moved: RD

Seconded: JS

3.1. SITE TOUR

JS, RC and RS attended a site tour with SF and DE. The tour took in new longwall equipment on the surface, subsidence zones above LW101 to LW105, subsided house known as 'Barton Hedge' and the main ventilation fans.

3.2. BUSINESS ARISING FROM PREVIOUS MINUTES

RS welcomed RC to the committee. RC said the positions were elected and they wanted someone with experience and he was pleased to be here.

SB said that due to GH absence he had requested Kirsten Gollogly, Whitehaven HSEC General Manager, to postpone until next meeting to talk about Whitehaven and the regional dust network. LF said she could provide an update but if the main person isn't here then we can wait, which SB confirmed.

DE provided an update on the exploration to the south and the application for the exploration license to the north-west. DE went through plans of the FY exploration drilling program. JS asked about previous drilling and DE said we have done some in the cleared areas in the south but none

WHITEHAVEN COAL

in the forest. JS asked how many outside of the mining lease have already been done, SB said maybe 20 and DE said 20 or 30 but all in cleared areas. RD asked about the icons and DE explained the approval pathway for some holes are different. RS asked how long it takes to get through Government and DE said it depends on the application such as a Review of Environmental Factors (REF), which is a targeted assessment, takes longer. SF stated that the Government has set timeframes for processing but a REF takes the mine a while to prepare before applying. SB said this has taken over a year and we already hold the exploration licence but includes talking with Government and Forestry. SB said there is a lot of duplication. RS said these things are critical to us for jobs and development and one of the hold ups is Government approvals including mining but also agriculture and businesses need to be able to plan. SB said the rules change during the process and this makes it very hard to do business. RC said we always talk about bringing business/industry to town but we are based on primary industries, including mining, forestry, fishing and agriculture, but the Namoi doesn't provide much fishing and they have canned the logging. RC said we had a sustainable logging industry that had been there for 100 years and when that gets taken away you need mining or coal seam gas to work with to reap the benefits for the community. RC said this needs to be done safely and the best way for the environment but we can then build infrastructure and a community as a sustainable model at the end of the day based on the money from mining etc. JS asked where the national park starts and SF said it is further south and JS said maybe west as well. RS asked if this is the new 5000ha area JS is referring to and RS said it is a lot further away on the other side of the highway. DE also stated that we are planning to do two lines of seismic surveys, which is producing a vibration using small explosives to give an indication of major structures below the surface. DE explained the process and locations. JS said that is a lot of holes at 10-15m spacing's, which DE confirmed. RD asked if any will be used for groundwater monitoring which DE confirmed with 1 to the SW. JS asked if we were doing one east as well and SF said we already have 3 to the east. RS asked if there were any guestions and there were none. DE said the clearing had commenced. DE showed another plan and advertisement notices for the north-west application areas and explained where the process is up to. JS asked about the location and SB confirmed where the existing lease is. JS asked about the Gorman Range and DE explained it is further south. RS asked how close it goes to Westport Road, DE pointed out the location and confirmed it is nowhere near Wesport Road. RC asked if the mine would go from the existing underground to the new area, which SB confirmed. DE said it would be around 18km. SB said at this point in time we have made the application and that is it. RS asked how it looks out there and DE said we don't really know as there are only a couple of boreholes. DE explained the advertising arrangements. RC asked if this would extend the life of the mine, which SB confirmed if proven. DE explained that letters will be sent to local landholders. RS said it could be frightening which DE confirmed if no exposure to mining but that is why we are sending out the letters. RS said its interesting because Santos will be looking in the same area and SB said there is coal there but they are below us but you can have petroleum leases and mining leases overlapping.

4. GENERAL BUSINESS

4.1. OPERATIONS PROGRESS REPORT

The operations update was provided as follows:

FY-to-date 3,786,849 Coal Railed (t): November 2016 669,650 FY-to-date 3,607,202

Average workforce numbers (November 2016):



144

	NCO	Waged – 144
		Salary – 116
		Total – 260
	Contractors	Total – 126
Safety Update (FY to I	November 2016):	
	Lost Time Injury (LTI)	1
	Days LTI Free:	53
	Total Recordable Injuries:	8
	Planned Task Observations:	3,292
	Take 5 Assessments:	42,136
	Work Hours (Nov-16):	91,947

SB went through the operations report. JS asked where the new bits of gear are and SB said they are going underground now. SB said we are going through a \$83M upgrade including the power outage today, which is part of the upgrade works. SB said the mine will be doing a cleanskin employment program in the new year of around 20-30 people, 5-6 at a time. RC asked if it is a couple of months and SB said its about 6 months. RC asked what the mine look for and SB replied we don't seek qualifications and we are more interested in attitudes and younger blokes in their 20 or 30's as it is quite physical work. JS asked about apprentices and SB said we have about half a dozen onsite at the moment. RS asked where we advertise and SB said in the local papers. RC stated that qualified electricians would be taken to another level of expertise, which they can use in the future. JS asked about the cleanskins and stated that businesses may be struggling and then people leave to work at the mine to which SB said employment in Narrabri is good at the moment and RC stated that we need to create these opportunities. RS said that the Chamber had found that people weren't leaving to work just for the money but stated that it was also to do with working long hours/weekends etc. RC said that the mines might take some people but then other people take their roles. JS asked about doing anything through the TAFE/High School and SB said we get apprentices through TAFE and they go to the Hunter to work in industrial workshops that we don't have around here. JS asked if the mine could take kids from Year 10 that aren't that interested in School and SB said they were a bit young for the mine. JS stated that if there was some incentive like a job to stay in school then they might stick around or keep out of trouble. RS said Whitehaven had a presence at the High School presentation night, which was good. RS said that he saw a recent advertisement in the Courier, which noted the Gunnedah region and thought that it should also mention Narrabri. SB said he understands but it is prepared by people remote from here not sensitive to local issues. RS said there was no presence in town either. RC asked if these positions, particularly the trades, have higher pay rates than normal. SB said they do but underground mines have higher pay rates then open cuts as well. RC asked if you get a lot of younger people looking for those jobs and SB said trades no but the mine operators we expect up to 30 applications. JS asked if people come to the mine looking for work and SB said no. RC stated that he wished these opportunities were around when he was younger. JS said it would be good to see some sort of cadetship or something. RS said they developed an agriculture traineeship that gave kids skills when they left School. RC said school based apprenticeships are very popular. JS said the likes of Santos could better spend money than sponsoring sports etc by putting it into people and training.

4.2. ENVIRONMENTAL OVERVIEW

SF went through the environmental report. GH stated that the groundwater water levels didn't jump up with all the wet weather we've had. RS said that just goes to show that the levels are affected by



river flows and not rainfall. SF said we had all that rain but it wasn't until September that we got all of the flows. JS said it has been dry at the back of his property and he wasn't expecting that. RS said the rain would have helped with the dust and changes from this time last year and SF said the results show some high results in October last year but this could be do with agricultural activity at the time. RC said he was at a meeting at Boggabri Coal and there was a guy there talking about noise pollution and these days they can take out a cow noise when it is beside the monitor and how noise travels and it was quite interesting. JS said when the mine first started they said the noise wouldn't affect his place as it would go over as the mine is on a hill but he said with the cooler weather in winter it gets loud. RS asked if there were any questions and there were none.

5. NEW BUSINESS

RC asked if there was anything he could take back to the Council and SB said no as the common things are when we are going through approvals and things like that. DE said maybe exploration but there is no requirement at the moment it is more to let them know. RS said he enjoys coming to this CCC as everyone is practical. RS wished everyone a good Christmas and new year. JS thanked RC for attending as well.

6. NEXT MEETING

Wednesday 15th March 2017 at 4:00pm. Narrabri Mine Site Office.

7. CLOSURE OF MEETING

Meeting closed at 5:20pm.



Narrabri Mine Community Consultative Committee Meeting #35

Environmental Monitoring Report: September – November 2016

Noise Monitoring

Attended noise monitoring was undertaken between Monday 26th to Wednesday 28th September 2016 (Tables 1-12) to verify if noise levels were within compliance limits. The results from this monitoring are detailed in the tables below.

Table 1: NM Operational Noise Monitoring Results – 26 September 2016 (day)									
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources				
		Leq (15 min)	speed/direction	(°C/100m)					
R4 Oakleigh	1:10 pm	38	3.8/285	n/a	Birds (37), traffic (28), wind (28), NM (22)				
R13 Newhaven	4:29 pm	48	3.7/243	n/a	NM (30*), birds (29)				
R16 Belah Park	2:50 pm	41	4.3/284	n/a	Traffic (40), wind (30), birds (27), NM inaudible				

*Noise from water pump nearby monitoring location

Table 2: NM Operational Noise Monitoring Results – 26 September 2016 (evening)									
Location	Time	Total dB(A),	Total dB(A), Wind Temp Grad Stability Identified Noise Sources						
		Leq (15 min)	speed/direction	(°C/100m)	Class				
R4 Oakleigh	8:31 pm	30	0.3/181	+4.8	F,F	Traffic (26), frogs (26), NM (22)			
R13 Newhaven	9:13 pm	50	2.0/242	+3.8	E,F	NM (32*)			
R16 Belah Park	7:50 pm	44	0.8/288	+3.4	E,F	Traffic (44), NM (31), frogs (29)			

*Noise from water pump nearby monitoring location

Table 3: NM Operational Noise Monitoring Results – 26/27 September 2016 (Night)										
Location	Time	Total dB(A), Leq (15 min)	Wind speed/direction	Temp Grad (°C/100m)		Identified Noise Sources				
R4 Oakleigh	10:00 pm	33	1.4/224	+4.1	E,D,D,D	Traffic (32), frogs (25), NM (20)				
R13 Newhaven	12:27 am	51	1.3/284	+4.4	D,D,E,E	NM (33*)				
R16 Belah Park	11:15 pm	41	1.9/246	+5.2	F,G,E,D	Traffic (41), NM (28), frogs (26)				

*Noise from water pump nearby monitoring location

Table 4: NM Operational Noise Monitoring Results – 27 September 2016 (day)									
Location	Time	Total dB(A),	Wind	Temp Grad	Identified Noise Sources				
		Leq (15 min)	speed/direction	(°C/100m)					
R1 Bow Hills	10:45 am	44	5.7/280	n/a	Traffic (44), wind (35), NM (28), birds (25)				
R2 Ardmona	11:43 am	53	5.5/272	n/a	Traffic (53), wind (41), birds (31), NM (24)				
R4 Oakleigh	12:09 pm	45	7.8/274	n/a	Wind (45), birds (32), traffic (26), NM (24)				
R6 Matilda	11:15 am	46	5.8/277	n/a	Wind (46), birds (33), NM inaudible				
R13 Newhaven	1:55 pm	49	6.4/269	n/a	NM (31*), wind (35)				
R16 Belah Park	9:07 am	40	5.4/292	n/a	Traffic (40), birds (27), NM inaudible				

*Noise from water pump nearby monitoring location



Table 5: NM Operational Noise Monitoring Results – 27 September 2016 (evening)									
Location	Time	Total dB(A), Leq (15 min)	Wind speed/direction	Temp Grad (°C/100m)	Stability Class	Identified Noise Sources			
R1 Bow Hills	7:27 pm	50	2.8/193	Lapse	E	Traffic (49), frogs (42), NM (31)			
R2 Ardmona	8:13 pm	48	1.6/221	+3.7	E	Traffic (48), frogs (34), NM (22)			
R4 Oakleigh	8:40 pm	32	1.8/198	+5.0	D,D	Traffic (29), frogs (29), NM inaudible			
R6 Matilda	7:51 pm	24	2.4/202	0.0	D	Frogs (24), NM inaudible			
R13 Newhaven	9:21 pm	51	1.5/219	+6.5	E,D	NM (33*)			
R16 Belah Park	6:51 pm	42	2.8/203	+0.8	D,D	Traffic (42), frogs (29), NM (26)			

*Noise from water pump nearby monitoring location

Table 6: NM Operational Noise Monitoring Results – 27/28 September 2016 (night)									
Location	Time	Total dB(A),	Wind	Temp Grad	Stability	Identified Noise Sources			
		Leq (15 min)	speed/direction	(°C/100m)	Class				
R1 Bow Hills	10:26 pm	44	2.0/155	+5.8	E	Traffic (42), NM (37), frogs (36)			
R2 Ardmona	10:48 pm	43	1.1/151	+4.6	E	Traffic (43), frogs (26), NM (21)			
R4 Oakleigh	11:14 pm	31	1.2/161	+2.5	F,F,D,D	Frogs (30), traffic (24), NM inaudible			
R6 Matilda	10:03 pm	24	1.3/154	+4.3	D	Frogs (22), traffic (20), NM inaudible			
R13 Newhaven	1:48 am	50	1.6/143	+3.6	D,E,E,E	NM (32*)			
R16 Belah Park	12:29 am	42	1.6/159	+4.8	E,D,E,E	Traffic (42), NM (33), frogs (24)			

*Noise from water pump nearby monitoring location

Table 7: NM Operational Noise Monitoring Results – 28 September 2016 (day)									
Location	Time	Total dB(A), Wind		Temp Grad	Identified Noise Sources				
		Leq (15 min)	speed/direction	(°C/100m)					
R4 Oakleigh	10:44 am	36	1.2/141	n/a	Birds (36), traffic (24), NM inaudible				
R13 Newhaven	12:36 pm	51	1.6/97	n/a	NM (33*)				
R16 Belah Park	9:01 am	39	3.0/119	n/a	Traffic (39), birds (27), NM inaudible				

*Noise from water pump nearby monitoring location

Table 8: NM Operational Noise Monitoring Results – 28 September 2016 (evening)									
Location	Time	Total dB(A),	Wind	Identified Noise Sources					
		Leq (15 min)	speed/direction	(°C/100m)	Class				
R4 Oakleigh	8:43 pm	44	0.6/196	+8.0	F,D	NM (43), traffic (35), frogs (33)			
R13 Newhaven	9:29 pm	51	0.8/83	+4.4	E,D	NM (33*)			
R16 Belah Park	8:00 pm	45	1.6/292	+5.1	E,E	Traffic (45), frogs (30), NM inaudible			

*Noise from water pump nearby monitoring location



Table 9: NM Operational Noise Monitoring Results – 28/29 September 2016 (night)									
Location	Time	Total dB(A),	Total dB(A), Wind Temp Grad Stability Identified Noise Sources						
		Leq (15 min)	speed/direction	(°C/100m)	Class				
R4 Oakleigh	10:18 pm	42	0.8/57	+5.1	E,D,F,F	Traffic (41), NM (35), frogs (31)			
R13 Newhaven	12:51 am	51	1.4/229	+5.4	E,E,E,D	NM (33*)			
R16 Belah Park	11:39 pm	30	0.8/161	+5.2	E,E,D,D	Frogs (28), NM (25)			

*Noise from water pump nearby monitoring location

Table 10: NM Sleep Disturbance Monitoring Results – 26/27 September 2016 (night)									
Location Time dB(A),L1 (1 min) Wind speed / direction Temp Grad (*C/100m) Stability Class									
R4 Oakleigh	10:00 pm	23	1.4/224	+4.1	E,D,D,D				
R13 Newhaven	12:27 am	35*	1.3/284	+4.4	D,D,E,E				
R16 Belah Park	11:15 pm	33	1.9/246	+5.2	F,G,E,D				

*Noise from water pump nearby monitoring location

Table 11: NM Sleep Disturbance Monitoring Results – 27/28 September 2016 (night)						
Location	Time	dB(A),L1 (1 min)	Wind speed / direction	Temp Grad (°C/100m)	Stability Class	
R1 Bow Hills	10:26 pm	42	2.0/155	+5.8	E	
R2 Ardmona	10:48 pm	24	1.1/151	+4.6	E	
R4 Oakleigh	11:14 pm	n/a	1.2/161	+2.5	F,F,D,D	
R6 Matilda	10:03 pm	n/a	1.3/154	+4.3	D	
R13 Newhaven	1:48 am	35*	1.6/143	+3.6	D,E,E,E	
R16 Belah Park	12:29 am	37	1.6/159	+4.8	E,D,E,E	

*Noise from water pump nearby monitoring location

Table 12: NM Sleep Disturbance Monitoring Results – 28/29 September 2016 (night)					
Location	Time	dB(A),L1 (1 min)	Wind speed / direction	Temp Grad (°C/100m)	Stability Class
R4 Oakleigh	10:18 pm	40	0.8/57	+5.1	E,D,F,F
R13 Newhaven	12:51 am	35*	1.4/229	+5.4	E,E,E,D
R16 Belah Park	11:39 pm	28	0.8/161	+5.2	E,E,D,D

*Noise from water pump nearby monitoring location

During the September 2016 monitoring, under the operating and meteorological conditions at the time, for the worst-case 15-minute compliance measurement periods, the mine noise was compliant at all monitoring locations with the exception of Bow Hills during the night time period on 27th September 2016 and at Oakleigh during the evening period on 28th September 2016. The Bow Hills property is under a private agreement and the noise levels recorded were compliant. The levels detected at the Oakleigh property were measured under inversion conditions as measured by the sites inversion tower, however, as this is not yet approved under the mine's Environmental Protection Licence (EPL) the levels recorded were reported to the EPA, Department of Planning and Environment (DP&E) and the landholder. The mine has commenced negotiations for acquisition of the affected property.



Deposited Dust Monitoring

Month	ND1 Turrabaa	ND2 Claremont	ND3 Bow Hills	ND4a New Matoppo	ND5 Claremont	ND6 Willarah	ND7 Claremont	ND8 Claremont	ND11 Oakleigh	ND12 Merriman
Dec-15	3.7	2.2	0.8	2.8	2.6	2.1	0.8	1.6	0.9	1.3
Jan-16	1.2	0.7	0.5	2.9	2.4	0.9	0.8	0.3	0.1	1.4
Feb-16	0.9	2.5	0.8	1.0	2.4	1.3	3.5	1.4	9.4	0.9
Mar-16	1.0	1.0	0.5	2.2	1.9	0.8	0.8	1.1	0.9	0.6
Apr-16	1.1	1.2	1.9	4.8	1.7	0.8	0.5	1.8	6.6	1.5
May-16	4.6	1.9	0.7	1.5	1.8	0.8	2.4	1.7	0.9	0.6
Jun-16	1.2	2.8	0.3	1.0	2.2	0.4	1.1	0.5	4.6	0.6
Jul-16	2.5	0.3	0.1	0.3	2.4	0.2	3.4	0.2	0.1	0.3
Aug-16	1.2	1.8	0.6	0.6	1.3	0.2	5.5	1.3	0.5	0.7
Sep-16	0.9	1.8	0.3	0.6	4.3	0.6	1.7	1.9	2.2	1.1
Oct-16	0.6	5.1	0.3	0.1	2.2	0.4	3.1	0.4	0.7	0.3
Nov-16	2.6	1.5	0.3	2.8	2.1	0.4	0.6	3.2	0.3	0.3
Annual Average	1.8	1.9	0.6	1.7	2.3	0.7	2.0	1.3	2.3	0.8

All deposited dust levels are within the compliance limit of 4 g/m²/mth.

High Volume Air Sampling (PM₁₀)

 PM_{10} measurements taken to the end of October 2016 for the "Claremont" High Volume Air Sampler (HVAS) are returning a running annual average of 9.27 µg/m³, which is well below the annual average limit of 30 µg/m³.



 PM_{10} measurements taken to the end of October 2016 for the "Turrabaa" High Volume Air Sampler are returning a running annual average of 8.84 µg/m³, which is also well below the annual average limit of 30 µg/m³.



 $\ensuremath{\mathsf{PM}_{10}}$ levels have remained compliant since the last meeting.

Groundwater Monitoring

Groundwater monitoring was completed in November 2016. Monitoring results are included below.























































Monitoring results show the recent rounds have been relatively stable with a slight recovery in well P13. As covered in previous reports, P13 is 30 m deep and targets the Garrawilla Volcanics. A production bore, WB2, is approximately 300 m to the south and targets the same aquifer and as such the drop in water level in P13 is likely associated with production from WB2.

Surface Water Monitoring

A wet weather discharge from licensed discharge points occurred during September 2016. Narrabri Mine's Environmental Protection Licence (EPL) outlines the limits for the following water quality parameters: Oil and Grease -10mg/L; pH -6.5-8.5; and Total Suspended Solids -50mg/L (no limits are set for Total Organic Carbon (TOC) or Electrical Conductivity (EC)). The table below shows compliance with these parameters.

Site	Date	рН	EC (us/cm)	TSS (mg/L)	TOC (mg/L)	Oil/Grease (mg/L)
SD2	15/09/2016	7.61	152	11	13	<5
SD5	15/09/2016	7.69	155	5	15	<5

Discharge Water Quality - 28th March 2014

For the same period, the surrounding creeks were sampled on nine occasions: 1st, 14th-16th, and 19th-23rd September 2016.

Subsidence

Narrabri Mine has monitored the subsidence movement across the surface of LW101 to LW106 in accordance with the approved Extraction Plan. The table below outlines the maximum subsidence parameters recorded as part of the subsidence monitoring program and a comparison with the maximum predicted subsidence parameters as outlined in the Extraction Plan. Monitoring has been undertaken on the 11kv power line that traverses the southern end of LW101 to LW105, however, this line has now been decommissioned.



Longwall Panels (LW) 101 to LW	106	
	Maximum Predicted Extraction Plan	Maximum Measured
Line 101 – Centre of LW101		
Subsidence (m)	2.69	2.633
Tilt (mm/m)	47	29.1 – 46.3
Tensile Strain (mm/m)	12.5 – 25^	8.7 – 20.7
Compressive Strain (mm/m)	16 – 32^	7.5 – 26.6
Angle of Draw (°, Degrees)	22.5 – 26.5	20.2
Line 102 – Centre of LW102		
Subsidence (m)	2.69	2.694
Tilt (mm/m)	45	43.7
Tensile Strain (mm/m)	11.5 – 23^	20.5
Compressive Strain (mm/m)	15 – 30^	46.7
Angle of Draw (°, Degrees)	22.5 – 26.5	20.8
Line 103 – Centre of LW103 – Nor	thern	
Subsidence (m)	2.75	2.729
Tilt (mm/m)	34	40.2
Tensile Strain (mm/m)	8 - 16^	18.8
Compressive Strain (mm/m)	10 – 20^	27.9
Angle of Draw (°, Degrees)	22.5 – 26.5	18.1
Line 103 – Centre of LW103 – Sou	thern	
Subsidence (m)	2.75	2.575
Tilt (mm/m)	34	30.3
Tensile Strain (mm/m)	8 - 16^	9.3
Compressive Strain (mm/m)	10 - 20^	9.6
Angle of Draw (°, Degrees)	22.5 - 26.5	22.8
Line 104 – Centre of LW104 – Nor	thern	
Subsidence (m)	2.75	2.794
Tilt (mm/m)	34	48.4
Tensile Strain (mm/m)	8 - 16^	42.6
Compressive Strain (mm/m)	20 - 40^	42.3
Angle of Draw (°, Degrees)	22.5 – 26.5	18.7
Line 104 – Centre of LW104 – Sou	thern	
Subsidence (m)	2.75	2.690
Tilt (mm/m)	34	31.2
Tensile Strain (mm/m)	8 – 16^	8.1
Compressive Strain (mm/m)	20 - 40^	6.7
Angle of Draw (°, Degrees)	22.5 - 26.5	13.2
Line 105 – Centre of LW105 – Nor	thern	
Subsidence (m)	2.75	2.663



Longwall Panels (LW) 101 to LW10	06	
	Maximum Predicted Extraction Plan	Maximum Measured
Tilt (mm/m)	30	46.3
Tensile Strain (mm/m)	6.5 – 13	17.7
Compressive Strain (mm/m)	17 – 34	44.6
Angle of Draw (°, Degrees)	22.5 – 26.5	17.9
Line 105 – Centre of LW105 – South	ern	
Subsidence (m)	2.75	2.614
Tilt (mm/m)	30	30.3
Tensile Strain (mm/m)	6.5 – 13	7.5
Compressive Strain (mm/m)	17 – 34	6.1
Angle of Draw (°, Degrees)	22.5 – 26.5	14.4
Line 106 – Centre of LW106 – North	ern	
Subsidence (m)		
Tilt (mm/m)		
Tensile Strain (mm/m)		
Compressive Strain (mm/m)		
Angle of Draw (°, Degrees)		
Line A – Cross Panel Survey Line		
Subsidence (m)	2.75	2.655*
Tilt (mm/m)	47	56.3*
Tensile Strain (mm/m)	12.5 – 25^	39.0*
Compressive Strain (mm/m)	20 – 40^	33.0*
Angle of Draw (°, Degrees)	22.5 – 26.5	24.2*
Line B – Pine Creek Tributary 1		
Subsidence (m)	2.75	2.589
Tilt (mm/m)	47	54.8
Tensile Strain (mm/m)	12.5 – 25^	13.1
Compressive Strain (mm/m)	20 – 40^	11.0
Gradient Change (%)	Up to 6	5.47
Line D – Pine Creek		
Subsidence (m)	2.75	2.809*
Tilt (mm/m)	47	45.5*
Tensile Strain (mm/m)	12.5 – 25^	10.7*
Compressive Strain (mm/m)	20 - 40^	15.2*
Gradient Change (%)	Up to 6	4.54*
Line E – Pine Creek Tributary 1 Cros	ssline 1	
Subsidence (m)	2.44	1.013
Tilt (mm/m)	47	26.9
Tensile Strain (mm/m)	11 – 22^	9.2



Longwall Panels (LW) 101 to LW106						
	Maximum Predicted Extraction Plan	Maximum Measured				
Compressive Strain (mm/m)	14 – 28^	2.9				
Line F – Pine Creek Tributary 1 Crossline 2						
Subsidence (m)	2.75	2.698				
Tilt (mm/m)	47	59.1				
Tensile Strain (mm/m)	12.5 – 25^	6.6				
Compressive Strain (mm/m)	20 – 40^	22.5				
Line G – Pine Creek Tributary 1 Crossline 3						
Subsidence (m)	2.75	1.419				
Tilt (mm/m)	47	29.2				
Tensile Strain (mm/m)	12.5 – 25^	12.0				
Compressive Strain (mm/m)	20 - 40^	11.9				

* - subsidence development incomplete.

^ - values for 'smooth' and 'discontinuous' (i.e. crack affected) subsidence profiles.

Based on the above table the subsidence predictions for the most recent complete longwall panel, i.e. LW105, indicate:

- The maximum subsidence measurements for the northern and southern monitoring lines in LW105 were within the predicted value of 2.75 m with a maximum measured value of 2.663 m.
- The maximum tilt measurements recorded for LW105 exceeded the maximum predicted value of 30 mm/m. However, 97% of all values were within the predicted range.
- The maximum tensile strain measurements for LW105 exceeded the range of predicted values of 6.5 mm/m (smooth profile) and 13 mm/m (discontinuous or crack affected profiles). However, 98% of the recorded values were within the predicted range.
- The maximum compressive strain measurements for LW105 exceeded the range of the predicted values of 17 mm/m (smooth profile) and 34 mm/m (discontinuous or crack affected profiles). However, 99% of the recorded values were within the predicted range.

The centreline subsidence results for LW101 to LW106 indicate that the Garrawilla Volcanics and Basalt Sill have not reduced subsidence through spanning behaviour.

The maximum subsidence is also considered closer to 63% of the average mining height of 4.3m. The subsidence predictions have been updated as part of the latest modification and are included in the above table.

Complaints

Six formal complaints were received during the period September to November 2016. Two were in relation to dust and four were in relation to noise. The dust complaints were actioned at the time of the complaint with additional sprays activated or the tripper moved to the fixed chutes. The noise complaints were followed up and the mine has now commenced acquisition negotiations with the affected landholder.

Environmental Incident(s)

No environmental incidents occurred during the September to November 2016 period.



