AGENDA
Upper Hunter Mining Dialogue
Joint Environment Working Group

UHMD Resource Centre, Upstairs of the Town Square Shopping Centre
Suite 1, 159 John Street, Singleton NSW 2330

Wednesday 26 September 2018: 9:00 am to 1:00 pm

Local dial in: 02 8319 9443
Organizer code: 376 453 97 / Participant code: 328 825 07

Agenda items		**Time**
1.	Welcome and Apologies	5 mins
2.	Minutes and actions of the previous meeting	5 mins
3.	Land Management: Rehabilitation and Mine Closure Update	10 mins
4.	Land Management: Rehabilitation Principles and Commitments 2017 **(Att)**	10 mins
5.	Land Management: Other projects update **(Att)**	5 mins
6.	Water: Hunter River Salinity Trading Scheme (HRSTS) Study	15 mins
7.	Water: Water Accounting Framework 2017 **(Att)**	10 mins
8.	Water: Other projects update	5 mins
	Mid meeting break - 10.00 am	**10 mins**
9.	**Joint content:** Dialogue Realignment Update	10 mins
10.	**Joint content:** Working Group Terms of Reference and Membership	10 mins
11.	**Joint content:** 2018 Forum Planning	30 mins
12.	**Joint content:** Synoptic Plan Review Update	15 mins
13.	**Joint content:** Update on Communications Activities **(Att)**	10 mins
	Break - 11.25 pm	10 mins
14.	Emissions & Health: Dust Risk Forecasting Scheme	10 mins
15.	Emissions & Health: Upper Hunter Air Quality Monitoring Network Update **(Att)**	10 mins
16.	Emissions & Health: Upper Hunter Air Quality Fact Sheets **(Att)**	5 mins
17.	Emissions & Health: Other projects update **(Att)**	5 mins
	Working Lunch - approx. 12:00 pm	
18.	**Presentation:** Cate Fisher - New project proposal on mine rehabilitation **(Att)**	20 mins
19.	Other Business / Next Meeting / Close (approx. 12:30 pm)	10 mins

UHMD Joint Environment Working Group
26 September 2018

Agenda Item 2

MINUTES AND ACTIONS FROM PREVIOUS MEETING

DRAFT MINUTES

Upper Hunter Mining Dialogue
Joint Working Group Water and Land Management Meeting

UHMD Resource Centre, Upstairs of the Town Square Shopping Centre
Suite 1, 159 John Street, Singleton NSW 2330

Wednesday 27 June 2018: 10.00 am- 12.10 pm

Attending

Julie Thomas (Chair)	Muswellbrook Coal
Bill Baxter	Yancoal
Bob Mackie	theresource
Catherine Lewis	Resources Regulator
Di Sneddon	Community individual (presentation only)
Cameron Archer	Tom Farrell Institute
Craig Milton	NSW Minerals Council
Glenda Briggs	NSW Department of Primary Industries
James Barben	NSW Minerals Council
John Campbell	Bengalla Mining Company
Ken Bray	Hunter Valley Water Users Association
Mark Scandrett	Muswellbrook Shire Council
Mark Slade	Community individual
Matt Parkinson	AGL Bayswater Power Station
Neil Griffiths	NSW Department of Primary Industries
Ron Fenwick	Wambo CCC / Community Individual

Guests

Steve Barry	NSW Department of Planning and Environment
Hamish Aiken	NSW Department of Planning and Environment

Apologies

Chris Knight	The Bloomfield Group
Chris Quinn	The Bloomfield Group
Craig White	Bengalla Mining Company
Jim Morgan	Wybong Action Group / NSW Farmers' Association
Jo Powells	NSW Department of Primary Industries
Jonathan Deacon	BHP
Karen Marler	NSW Environment Protection Authority
Merri Bartlett	Peabody Energy
Monique Meyer	Resources Regulator
Ngaire Baker	Mount Pleasant Operation
Nigel Charnock	Glencore
Paul Amidy	Glencore
Sean Constable	Upper Hunter Shire Council
Simon Turpin	Local Land Services
Tim Roberts	Tom Farrell Institute
Wendy Bowman	NSW Mine Watch

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1. Welcome and apologies

The Chair welcomed all attendees. Mr. Barben thanked the Chair for accepting the Chairing duties and thanked Mr. Baxter for his commitments as Chair in previous years.

2. Minutes and actions of the previous meeting

The minutes of the previous meeting were accepted. Mr. Barben provided a summary of the outstanding actions, noting that several documents had been circulated to follow up actions.

3. Rehab Reform Program

Mr. Barben provided a summary of the intent of the Rehabilitation Reform Program and the new components this would involve, and that this would be expected to be released in the coming weeks.

Ms. Lewis noted this would now be referred to as the Operational Rehabilitation Reforms given they are focused on post-approvals. The change in name has been to avoid confusion with the DPE policy work around rehabilitation that is more focused on the planning and assessment phase.

Ms. Lewis noted that the consultation period for the reforms will extend to a 12-week period, which is double the initial 6-week period. The Resources Regulator will then be looking at the feedback received and incorporate revisions for finalisation and implementation of the reforms and the rehabilitation GIS portal in January 2019.

Mr. Barben noted that the recent DPE restructure has seen the ESU back within the Resources Regulator (like 2014 arrangements) and separated from the Titles unit within DRG. Inspectors would be reporting to Matt Newton as Director, Compliance Operations and Anthony Keon, Resources Regulator Chief Regulator, with roles likely to be split between compliance and approvals.

Mr. Baxter queried whether mining operations plans will go through to new departments. Ms. Lewis advised the department will operate as business as usual for the time being and recommended that sites contact their current key contact. In future it will go through titles portals, while detailed assessments will be referred to the Resources Regulator. A decision maker that sits within titles will make the final decisions, however these details are still to be finalised.

Mr. Barben noted the government is planning to respond to submissions received from the Improving Mine Rehabilitation discussion paper.

4. Rehabilitation Principles and Commitments 2017

Mr. Milton provided a brief overview of the key outcomes from the 2017 reporting period for the annual Dialogue rehabilitation project, noting that these are undergoing final assessment. Members noted that it would be good to provide contextual information regarding Mount Pleasant Operation's impact on the overall results, given it is in its initial stages and included in the figures for the first time, as well as highlighting the amount of biodiversity offsets and agricultural land owned by mining companies.

5. Update on current land management projects

Mr. Griffiths noted that there has been limited progress made in the new ACARP project, with administrative delays and environmental issues such as drought preventing any field work being undertaken. Mr. Griffiths also noted there has been limited contact with companies, and the provision of data has been slow from sites to date. Mr. Griffiths is currently reviewing the project and will seek to vary the timing of the project at an upcoming ACARP meeting and to enable this to push back six months. Approval will be needed for a formal contract variation. JWG members agreed this made sense given the weather issues. Mr. Baxter noted that he would follow this up as an industry monitor.

6. DPE Presentation

Mr. Barry and Mr. Aiken provided a detailed overview of their mine rehabilitation visualisation tool. The

tool has been developed as a community awareness tool for rehabilitation and to give everyone a sense of final landforms. Given the size of the data, there are challenges to providing this to the public, however the intention is that this will sit as a web resource. It is currently in draft form, but DPE is looking to get community involved and testing the resource to provide feedback on improvements needed.

The demonstration prompted a range of comments from members, including:

- Inserting dates into the final landforms displayed. DPE explained these have been purposely left as arbitrary dates at the moment, as they are all just final current approvals. DPE noted these will change as modifications arise, however it is the government's intention to make these visible as this project progresses. DPE noted dates could be provided via a speech bubble, or a sliding representation at different stages, however this would increase the data-heavy nature of the resource.
- Suggestion that this data might be showcased at a DPE community environment office in the Upper Hunter.
- Suggestion for better colour definition around cropping and woodland data. DPE noted that they still need to do a bit of editing work around boundary displays.
- Query as to whether there is any ability to drill down into detail on these areas or to look at two boundaries at once? DPE advised they aren't looking to provide a full spatial data set but provide a visual representation of the final landforms.
- Members discussed water bodies being displayed. DPE noted there are complexities displaying these, however they're filled to the equilibrium level that sites have in their assessments.
- Query regarding a pre-mining view of sites. DPE advised this is something that can be explored and would probably be more possible with recent mines.
- Query regarding updating data on a yearly basis. DPE advised that Truescape has said this is possible as yearly updated layers, however there needs to be a level of demand and funding to maintain this.
- Suggestion to allow searching for views of sites from specific locations. DPE noted that they could provide drive-through looks of operations.
- Suggestion that this is something that the Dialogue could take to regional shows to demonstrate to community members.
- Suggestion for a scale ruler to better show the size of these areas.
- Suggestion to include a layer of the original Synoptic Plan. DPE noted that they need to start feeding this data into the Regional Plan.

Mr. Barry outlined the next steps for the project, noting that industry is currently checking how their data is displayed. Once this data is returned, DPE will be able to make this more broadly available to provide for user acceptance testing. Members discussed the potential to make this available at CCC meetings.

Mr. Archer advised that there are misconceptions in the community as to the quality of the land in the Upper Hunter before mining. In many cases it was very rundown agricultural land, which may well be improved through mine rehabilitation. Mr. Archer suggested seeking data from the Lands Department on the Hunter land from the 1950's or so to determine what the productivity of the land was to get a better idea of intensive farming. This imagery should be available and DPE can look to work this in.

Ms. Briggs noted the Department of Industry is progressing some strategic planning looking at the availability of water taking into account the CSIRO study and will be seeking to undertake targeted consultation shortly around September 2018. The Government is currently considering this and is expected to sign off shortly. Mr. Barben noted that the Dialogue has sought an update from Eddie Harris at DPI Water on these reforms. Ms. Briggs noted that she would be meeting shortly and could raise that the Dialogue is looking to receive an update.

Mr. Barry also provided an update on the Improving Mine Rehabilitation discussion paper and broader DPE policy work in this area. DPE are currently working through the response to get more of a coherent agenda for the government regarding mine rehabilitation. As a result of the discussion paper, DPE will be able to develop a high-level policy framework, with an Action Plan many of which are focused on the Hunter, and identify information gaps, which will bring together broader work DPE and DRG has done. DPE do not intend to go back to stakeholders with an additional paper and will seek to meet with key stakeholders to discuss how they've considered their feedback.

ACTION:

- **Dialogue secretariat to liaise with Ms. Briggs regarding securing a presentation on DPI**

Water's 'water availability' projects.

7. Strategic Discussion on Dialogue Objectives

Mr. Barben provided an overview of the early 2018 strategic discussion, noting a reduction in emerging environment issues and a move towards future planning issues, as well as communication with stakeholders. The consolidation of the Joint Working Groups into a single Joint Environment Working will enable the Dialogue to discuss this information in a more efficient manner and reduce duplication of content and personnel.

Mr. Barben provided an overview of the intent of the Communications Working Group and Economics and Social Development Working Groups. It was noted the economics group would be looking at how to better utilise buffer land, and seek strategic land use and economic diversification opportunities, and would seek to link in with business chambers and council representatives working in this area to build a better relationship with industry and business. Mr. Barben advised that if any members wish to be involved, they should contact the Dialogue secretariat.

Mr. Archer suggested Dialogue consider contacting Trevor John at Regional Development Australia (RDA) Hunter, as well as University of Newcastle's Richard Bush. Given the RDA is a federal body, it would be good to feed into their processes and help influence work for the Hunter down the track.

Mr. Barben noted some recent discussions about opportunities in the Hunter region with solar farms, poultry relocation from South Australia to Hunter. These opportunities will ultimately depend on who is willing to invest and what land is available.

Mr. Barben noted the Statement of Objectives that was produced following JASC recommendations, which captures the key purpose and objectives of the Dialogue at this current time and will be updated as needed in future. Ms. Briggs noted the JASC appears to be working well.

8. Synoptic Plan Update

Mr. Barben provided an update on the developments with the Synoptic Plan. A new workshop would be held shortly, and all those included last year would be automatically captured in the 2018 workshop.

9. Update on communications activities

Mr. Mackie provided an update on the communications activities, especially regarding the Hunter Coal Festival and Tocal days, which provided good engagement opportunities for the Dialogue. Members noted that the school mine tours were progressing well.

10. Hunter River Water Quality Study

Mr. Barben noted that discussions with EPA are still underway to determine the approach to the next steps in the study. Members discussed when the initial report will be finalised, and Mr. Barben explained that the Steering Committee is seeking to determine an approach to addressing identified issues before publishing.

Mr. Archer advised that there has been considerable discussion on water quality recently and noted that the results of this report were pleasing and would be great to share with academics when possible. Mr. Bray noted that the salinity in the river has improved over years through the scheme. Mr. Barben noted that there have also been calls to copy this assessment in parts of Queensland.

Members noted that the Dialogue is awaiting feedback from the EPA to decide, and we would seek to have a finalised position in the next couple of months with a view to complete the additional study by the end of the year. The EPA have been very constructive and supportive of the project to date, so it is hoped this approach will continue.

Mr. Bray advised that he would like to see industry testing their sites on a regular annual basis to provide ongoing continuous data as this regular collection of data would help overcome negative public perceptions of poor water quality.

11. Bioregional Assessments

Mr. Milton provided a brief update on the bioregional assessments recently released.

12. Current land management and water projects

Mr. Milton provided an update on the Water Accounting Framework reporting project, noting that all data has been collected and the Dialogue is clarifying some operational efficiency data and groundwater splits. Contextual information will be provided in early July, so the final results will be known shortly and discussed at the September meeting.

Mr. Milton advised of the water reform action plan, noting that extensive consultation had recently been completed. Mr. Bray provided an update noting that this plan is locked into the federal work through the Murray Darling Basin Plan and is very compliance-focused, given over 80 people have been employed to manage the reforms. Mr. Bray expressed concern for the long-term future, and that the valley needs to be mindful of when Liddell goes offline, given their high security water licences. Mr. Bray noted the cost recovery for relinquished assets would be considerable and that industry was becoming more aware of their water constraints and responsibilities.

Mr. Parkinson advised that AGL was doing modelling on what will happen when Liddell switches off and expect more information to come out of this in the future.

13. General Dialogue matters

No general Dialogue business.

14. Next Meeting / Close

The Chair noted the next JWG meeting, noting this would be the first meeting for the combined Environment working group. Mr. Barben advised this would be held like the current merged Land Management and Water meeting, with distinct sections covering all environmental issues.

The meeting closed at 12:10 pm

Actions arising from meeting
UHMD Land Management and Water Joint Working Group Meeting

Action	Responsibility	Status
DPI Water Availability Projects		
Dialogue secretariat to liaise with Ms. Briggs regarding securing a presentation on DPI Water's 'water availability' projects.	Dialogue secretariat	In progress - DPI seeking a meeting with Upper Hunter stakeholders upon release of report.

DRAFT MINUTES

Upper Hunter Mining Dialogue
Joint Working Group Emissions and Health Meeting

UHMD Resource Centre, Upstairs of the Town Square Shopping Centre
Suite 1, 159 John Street, Singleton NSW 2330

Wednesday 27 June 2018: 2.00 pm to 2:35 pm

In attendance:

John Watson (Chair)	Glencore
Bob Mackie	theresource
Craig Milton	NSW Minerals Council
James Barben	NSW Minerals Council
John Campbell	Bengalla Mining Company
Julie Thomas	Muswellbrook Coal
Matthew Parkinson	AGL
Sarah Roberts	Singleton Council

Apology

Chris Knight	The Bloomfield Group
Genelle Scotts	Bengalla Mining Company
Karen Marler	NSW Environment Protection Authority
Mark Scandrett	Muswellbrook Shire Council
Maryann Crawford	Singleton Council
Neville Hodkinson	Singleton Shire Healthy Environment Group
Ngaire Baker	Mount Pleasant Operation
Sarah Withell	BHP
Wendy Bowman	NSW Mine Watch

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1. Welcome and apologies

The Chair welcomed attendees and noted apologies. Members discussed that there are varying indications from the community regarding increasing air quality that doesn't match a declining level of community interest in Dialogue meeting attendance or engagement on air quality issues.

2. Minutes and actions of the previous meeting

The minutes from the previous meeting were accepted. Mr. Barben provided a brief update on outstanding action items, noting the heritage issue raised by Mr. Hodkinson was discussed at the Joint Advisory Steering Committee, where the JASC recommended a structured format be provided to enable the Dialogue to consider the proposal in more detail. The Chair advised that the remit of the working group has historically tended to be more focused on health issues arising from emissions, rather than from a mental health perspective, and this request might best be considered through another Dialogue Working Group, however would await further advice from Dr. Hodkinson.

3. Strategic Discussion on Dialogue Objectives

The Working Group noted the update provided in the papers.

4. Upper Hunter Air Quality Education Fact Sheets

Mr. Milton provided an update on the air quality education fact sheets, which the working group noted.

5. Update on NSW Government Air Quality Initiatives

Mr. Barben provided an update on key NSW government initiatives. Mr. Barben noted that industry recently met with the EPA and were advised that the government is working in the background on Clean Air, Non-road diesel, and Load-based licencing, and it is expected that proposals on these issues would come back to industry later this year.

The North West Air Quality Monitoring Network is now operational. The Armidale station has been up and running as of April/May 2018, which has delivered some poor results so far.

6. Upper Hunter Air Quality Monitoring Network Update

Mr. Watson provided an overview of the recent UHAQMN results, noting these are usually provided one season behind from when they really should be. However, the recent results are similar to past results, albeit slightly elevated given the dry conditions.

The overall performance of industry is better than the 2013 period, which was the basis for the EPA's forecast work. Mr. Watson noted that there was discussion at a recent UHAQMN meeting on the forecast process, potential PRP's and tonnes moved data. EPA has advised that they are yet to announce how they will progress their forecasting project at this stage, as they are keen to improve accuracy before implementing.

Another issue that arose regarded the reporting of exceedances as per approvals. The definition of an 'extraordinary event' was also raised and members asked OEH how this should be defined. While industry must report exceedances immediately, it may take up to two weeks to determine whether this was an extraordinary event. Mr. Watson advised that Mitch Bennett recently convened a committee meeting with industry, OEH and DPE to create a framework assessment for determining these extraordinary events.

7. Update on communication activities

Mr. Mackie's update on communication activities was noted.

8. Update on current Dialogue projects

Mr. Barben noted recent discussions with Mark Gifford of the EPA, and the government's plan to leverage off Rural Fire Service air quality modelling, that shows similar levels of forecasting that OEH had developed. The RFS modelling is used to predict air quality as a result of backburning operations.

9. Other Business

No other business was discussed.

10. Next Meeting / Meeting Close

The Working Group noted that this is the last separate meeting of the Working Group, and that the emissions and health focus can be easily integrated into the one Environment meeting.

Mr. Barben noted that the Dialogue secretariat would seek updates from the EPA and OEH further in the year regarding these government initiatives.

Mr. Watson noted the lack of community involvement in air quality may be because people are interested and want to help, but don't know what they can offer or how to articulate their concerns. The

controls are managed at a site level rather than any individual buy-in. Mr. Barben noted that the concerns over air quality have also shifted to communications-themed projects.

Members discussed when would be the best time to host meetings and agreed that morning meetings seem to suit more people and that 9:00 am may provide better attendance than meetings over the lunch period. Mr. Milton noted that there is significant consolidation work to bring these two groups together under the Environment Working Group, so there is an opportunity to survey members on their preferences.

Meeting closed at 2:35 pm

No actions created.

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Agenda Item 3

REHABILITATION AND MINE CLOSURE UPDATE

Issue

There are several initiatives currently progressing across industry and the NSW government related to mine rehabilitation and future land use. See below for updates on specific projects and initiatives.

Background

Operational Rehabilitation Reforms

Formerly referred to as the Rehabilitation Reform Program, this project has now been renamed as to not be confused with the rehabilitation policy development that DPE are undertaking. These reforms have now been released on the Resources Regulator website and feedback is sought from interested parties by 31 October 2018. The Reforms include:

- Proposed Standard Mining Lease Conditions - The Conditions are the key regulatory tool covering Environmental Management, Protection and Rehabilitation, and the new document has taken key concepts from the MOP and elevated them into the proposed conditions.
- Four new Codes of Practice - The Codes cover Rehabilitation Management Plans for both Large and Small Mines, and the Annual Rehabilitation Report and Forward Program for both Large and Small Mines.
- Five new Guidelines - These cover Rehabilitation Risk Assessments, Rehabilitation Records, Rehabilitation Controls, and Rehabilitation GIS Portal and Guidance Material.

Please see the following link for more information regarding the reforms.
https://www.resourcesandgeoscience.nsw.gov.au/regulation/environment/operationalrehabilitationcompliance-and-reporting-reforms

NSW Government Improving Mine Rehabilitation Discussion Paper

The Department of Planning and Environment is yet to publicly respond to any submissions received through the consultation. The discussion paper proposed integrating rehabilitation requirements into the assessment and operational phases of mining and developing policies for how rehabilitation should be regulated and how final voids should be managed.

At the 2018 NSW Mining HSEC Conference, DPE representatives advised that the department was yet to make any decisions on how to proceed, noting that there were a varied mix of responses, of which several commented specifically on the future of voids in the Upper Hunter, despite the discussion paper not explicitly seeking feedback on the region.

Senate Committee Inquiry into mine rehabilitation

The Senate Committee inquiry into the 'Rehabilitation of mining and resources projects as it relates to Commonwealth responsibilities' was reopened in March 2018 following an amendment to the terms of reference, with dozens of additional submissions received. The inquiry has recently granted the Committee a further extension of time to report until 18 October 2018. The Committee inspected sites across the Upper Hunter throughout the inquiry to date.

Mine Rehabilitation Booklet

The UHMD secretariat continues to seek DPE's decision on whether to continue support for the mine rehabilitation booklet, which is still undergoing review by the Resources Regulator.

DPC Economic Diversification project

No update.

Recommendation:

- **JEWG members note the rehabilitation-focused activities underway.**

FOR INFORMATION / DISCUSSION

UHMD Joint Environment Working Group
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Agenda Item 4

REHABILITATION PRINCIPLES AND COMMITMENTS PROJECT UPDATE

Issue

The Rehabilitation Principles and Commitments project remains a key annual Dialogue activity. It is important that this project be completed in a timely fashion.

Background

The Rehabilitation Principles and Commitments project remains a key annual Dialogue activity. It is important that this project be completed in a timely fashion. All data has now been collected from industry, analysed by the Dialogue secretariat, and published on the Dialogue website: http://www.nswmining.com.au/dialogue/latest-projects/land-management/rehabilitation-principles-and-commitments.

The Dialogue is progressing an annual rehabilitation reporting project infographic to communicate not only the 2017 results, but restate the principles, and provide some context behind the figures reported in terms of other land usage across the Hunter. Given this project commenced in 2012, there is also opportunity to provide some analysis of the key trends that have occurred across the past six years. These include a noticeable increase in biodiversity offsets and a decline in managed agricultural land.

The Industry Environment Working Group members have recently reviewed the document and recommended that additional contextual information regarding the land used in residential/town centre areas, as well as national parks be sought for inclusion in the document. This work is currently in progress.

Please find a draft infographic for 2017 attached for comment. Please note that this is still a concept document, and based on feedback from the JEWG, this will proceed to design phase and completion.

Recommendation

- The Dialogue encourages JEWG members to review the document and provide any additional feedback that may improve the document before it is finalised.

FOR INFORMATION/DISCUSSION

Attachment: Rehabilitation principles and commitments infographic

REHABILITATION

Industry Principles & Commitments 2017 Results

AN UPPER HUNTER MINING DIALOGUE FACT SHEET

Upper Hunter Mining Dialogue

Since 2012, the Upper Hunter Mining Dialogue has been collecting annual rehabilitation data and information from mining operations in the Upper Hunter to provide information to the community regarding the amount of rehabilitation activities being undertaken. This project supports the Dialogue's two primary land management goals:

- **Goal 1** - To decrease the time that disturbed areas are left without final or temporary cover, recognising that different mining operations are at different points in rehabilitation.
- **Goal 2** - To achieve a consistent level of best practice, quality, integrated rehabilitation – both within the industry and with future land uses - across the Upper Hunter and to be a responsible steward of the land.

The table below outlines the Dialogue's rehabilitation principles and other information sought from industry through this project.

Table 1 – Rehabilitation Principles and Commitments

Principle 1 – Include rehabilitation planning in mine planning

Principle 2 – Undertake progressive rehabilitation

Principle 3 – Minimise time that disturbed areas are left without vegetation

Principle 4 – Prioritise areas of rehabilitation and temporary cover to reduce impacts

Principle 5 – Meet target for rehabilitation progress identified in the Mining Operations Plan

Principle 6 – Set quality targets for rehabilitation in the Mining Operations Plan and implement a monitoring program to measure performance

REHABILITATION	2017 RESULT
Total land area disturbed and not yet rehabilitated at the beginning of the reporting period	214.1 km²
Total amount of land newly disturbed within the reporting period	13.3 km²
Total amount of land newly rehabilitated within the reporting period	7.6 km²
Total land area disturbed and not yet rehabilitated at the end of the reporting period	220.3 km²
Total area of rehabilitation at all operations at the end of the reporting period	123.7 km²
Annual rehabilitation to disturbance ratio	0.58
Overall proportion of disturbed land rehabilitated	36.0%
Estimate of total land held as biodiversity offsets	417.5 km²
Estimate of the total area of land managed for agricultural use (e.g. grazing, cropping, viticulture)	593.2 km²

LOCAL GOVERNMENT AREA (LGA) SIZES	
Muswellbrook	3,405 km²
Singleton	4,893 km²
Total	8,298 km²

MINING LAND USE	
Total disturbance across Upper Hunter LGAs	344 km²
Total mining rehabilitation completed	124 km²
Total disturbed land awaiting rehabilitation	220 km²

OTHER LAND USE	
Total agriculture land use[1]	2,432 km²
Total protected areas (incl. National Parks)	3,106 km²
Total urban area	TBC

Just

4.1%

of the total land in the Muswellbrook and Singleton LGAs is disturbed by mining

The amount of biodiversity offsets has increased almost

4 times

since 2012

The overall proportion of disturbed land rehabilitated continues to grow to

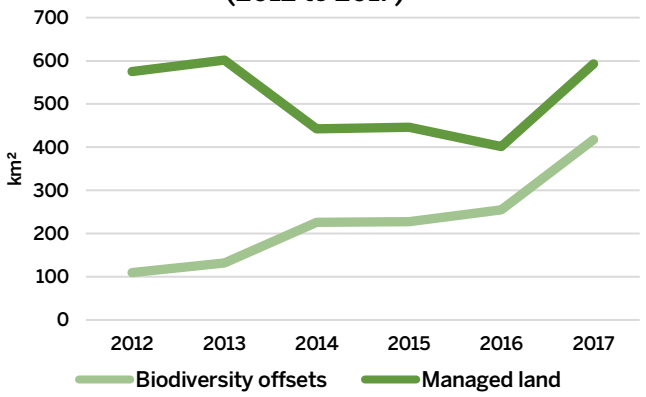
36%

of all land disturbed by mining in 2017

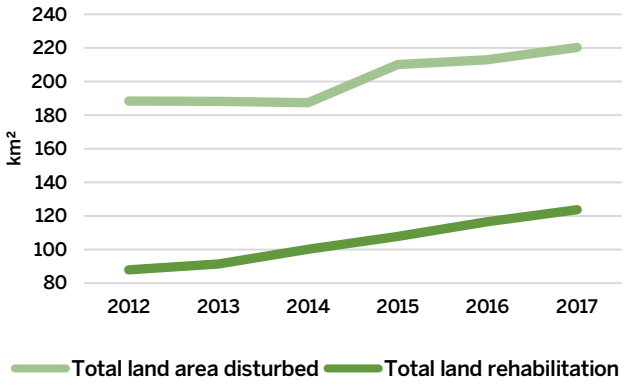
The total amount of mine rehabilitation has increased by over

40% in the Upper Hunter since 2012

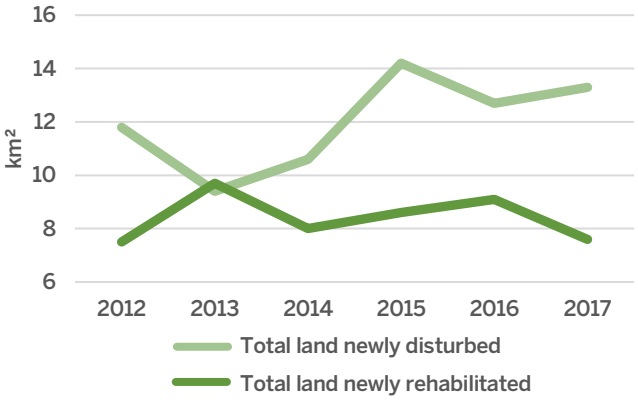
Biodiversity offsets and Managed land (2012 to 2017)



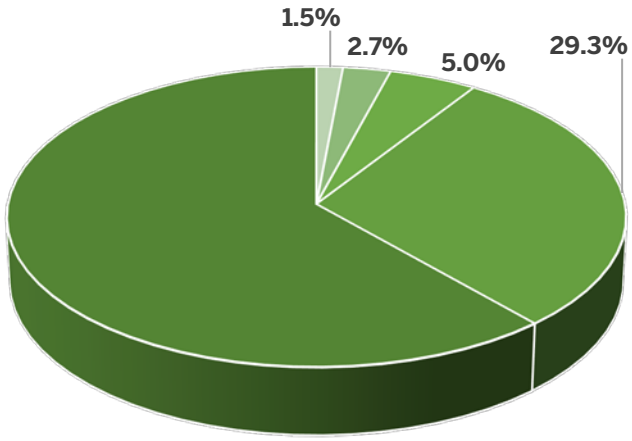
Total land disturbed and Total land rehabilitation (2012 to 2017)



Total land newly disturbed vs. Total land newly rehabilitated



Land Use in the Upper Hunter



Total rehabilitation completed	124 km²	1.5%
Total disturbed land not yet rehabilitated	220 km²	2.7%
Total biodiversity offsets	417 km²	5.0%
Total agricultural land	2,432 km²	29.3%
Total Muswellbrook & Singleton LGA area	8,298 km²	100.0%

Rehabilitation data for 2017 was kindly provided for this project by:
Glencore, Yancoal, The Bloomfield Group, BHP, Muswellbrook Coal Company, Peabody Energy, Mount Pleasant Operation, Bengalla Mining Company and Malabar Coal.

For more information, please visit **www.miningdialogue.com.au**

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Agenda Item 5

CURRENT LAND MANAGEMENT PROJECTS AND OTHER LAND MANAGEMENT BUSINESS

Please see below for updates on the current Dialogue land management projects:

Grazing Study and ACARP proposals

The Dialogue provided in-kind support for the successful ACARP project C27030 Examination of Past and Present Mine Rehabilitation to Grazing Land as a Guide to Future, which has received $166,203 in funding through the 2017 ACARP funding grant process.

The project is currently seeking the information from mines with some progress made in retrieving this information. Given the environmental conditions, it is currently too dry to undertake field work, so this has impacted progress.

The Dialogue will continue to assist where possible to coordinate the provision of industry data, and a meeting is being sought with mine rehabilitation personnel to report and review on progress and plan future action.

Rehabilitation Reporting and Principles

Please see **Agenda item 4** for more information.

Beneficial reuse of voids project

No update. The Dialogue secretariat will incorporate information provided in these fact sheets in our ongoing communication and messaging regarding voids throughout 2018.

Awareness and promotion of rehabilitation in the Hunter Valley / Mine rehabilitation booklet

Please see **Agenda item 3** for more information.

FOR INFORMATION

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Agenda Item 6

HUNTER RIVER SALINITY TRADING SCHEME (HRSTS) STUDY

Issue

A study into the water quality of the Hunter River has shown that while the overall quality is high, and the Hunter River Salinity Trading Scheme is functioning as intended, there are some further questions regarding elevated concentrations of elements that may require further assessment through an additional study.

Background

Following the initial study into the water quality at Hunter River Salinity Trading Scheme discharge points compared to the overall health of the Hunter River, the Dialogue secretariat has decided to proceed with additional investigations into an identified issue regarding nitrate.

The EPA has indicated that they are keen to continue exploring these issues through a subsequent study guided by the Steering Committee. The Dialogue is also seeking AGL's continued participation in this study. The Steering Committee recently convened to discuss what this additional study might contain and how it may be implemented.

Following these discussions, there will now be two components to the additional study:

1. A review of other data sources for context and rigour such as other data points that monitor Nitrogen and any other background data measuring Nitrogen; and
2. A modelling exercise using real discharge data to understand what the levels of Nitrates would be when released. Such data is currently being sourced.

The decision to commence the additional study prior to the release of the initial study has been taken to highlight that the Dialogue's commitment to ensuring that the issues identified are being promptly addressed and investigated by sites, independent consultants and researchers.

The final report of the initial study is expected to be published shortly on the Dialogue's website once the second study has commenced.

Recommendation

- **Members note the progress made by the Dialogue with regards to the initial and subsequent HRSTS studies.**

FOR INFORMATION / DISCUSSION

UHMD Joint Environment Working Group
26 September 2018

Agenda Item 7

WATER ACCOUNTING FRAMEWORK UPDATE

Issue

All data for the 2017 calendar year has been collected and analysed for the Dialogue's Water Accounting Project. The Dialogue's attention now focuses to distributing this information.

Background

The Dialogue secretariat has finalised both a detailed infographic and simple water use infographic as has been completed in previous years and are seeking to publicly release the results shortly on the Dialogue website and to news outlets in the coming weeks accompanied by a media release. Please find **attached** both infographics for reference.

Key figures to note from the 2017 project results include:

- 2017 was a far drier than average year, with 203.5 billion litres entering the river system in the Upper Hunter. This is down from 471 billion litres in 2015, and 274 billion litres in 2016 and comparable to the 2014 results.
- 42% of that water stayed in the river, which is down from 78% in 2015 and 62% in 2016.
- The amount of water extracted by farmers, residents and businesses in 2017 was 55%. This increased from 21% of total water used in 2015 and 36% in 2016.
- The mining industry used 3% of water in the Upper Hunter River System, up from 1% in 2015 and 2% in 2016, to the same level of use in 2014, under similar conditions.
- The mining industry reused more than half of its water onsite (55%), which is an increase in previous efficiency results of 50% or below.
- 0.45% of mine water was discharged into the Hunter River due to the drier than average conditions meaning that companies had few opportunities to discharge excess water into the Hunter River System and were in fact keenly conserving their stored water.

Recommendation

- **That JEWG members review the Water Accounting Framework infographics and discuss the project.**

FOR INFORMATION/DISCUSSION

UPPER HUNTER WATER BALANCE 2017

Mining's water use

Upper Hunter Mining Dialogue

The Upper Hunter Mining Dialogue assessed water use by the mining industry in the Upper Hunter in 2017. Using a common accounting framework, mining companies have reported their water inflows and outflows from operations. This has helped them to manage their water use and embark on water saving and reuse opportunities.

Hunter River System Extraction

69.4GL
Net Rainfall/Runoff and Evaporation

85.6GL
Flow Passing Singleton (Including flows for the environment)
= **42%**

134.2GL
Environmental Flows including Dam Release

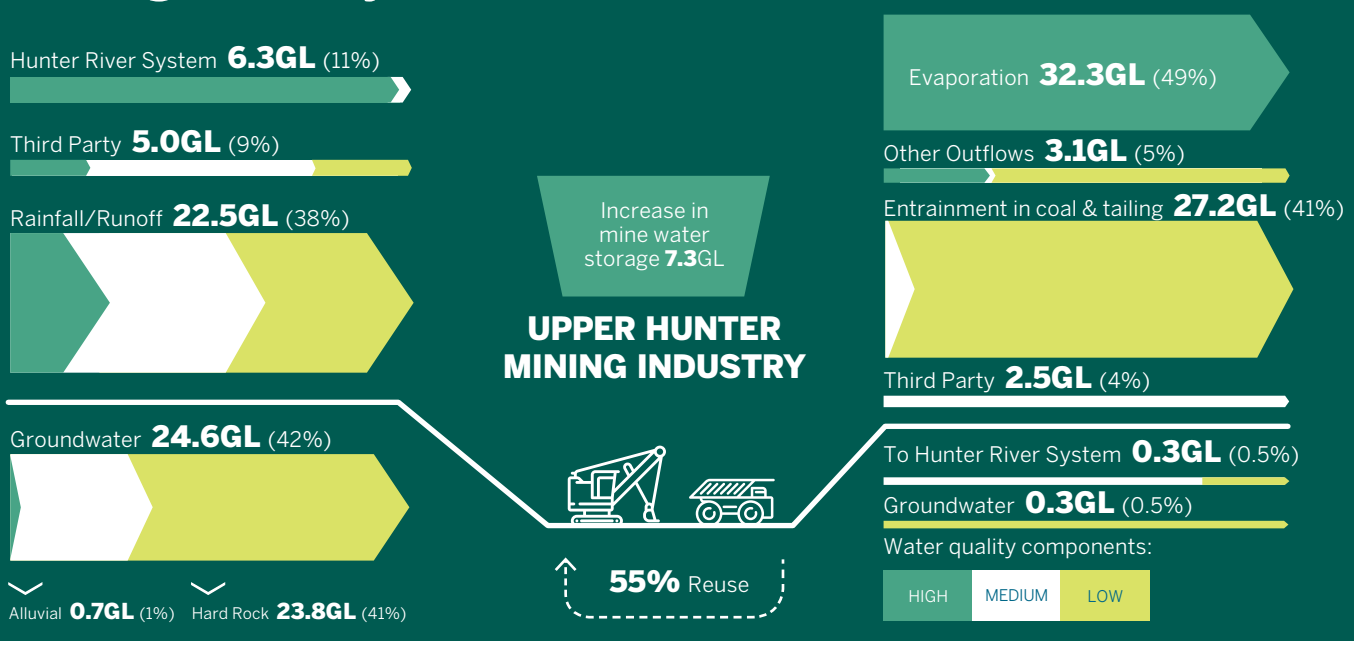
117.9GL
Total Extraction from Hunter River

111.7GL
Agriculture / Power Station / Town Water
= **55%**

6.3GL
Mining = **3%**

The rainfall in Scone during 2017 was 360mm, which is below the long-term average rainfall of 637mm. The dry conditions meant that companies did not have opportunties to discharge excess water into the Hunter River System, and were in fact keenly conserving their stored water.

Mining Industry Water Use Balance



ALMOST **6x**
as much water evaporated from the Hunter River System storage dams as was extracted from the Hunter River System by mining companies

The mining industry used JUST **3%** of water in the Upper Hunter River System

ONLY **12%** of mine water came from rivers and alluvial aquifers

38% of mine water was sourced from onsite rainfall and runoff

41% of water was sourced from deep aquifers that are of limited use to other water users due to their high salinity

The mining industry REUSED **55%** of its water onsite

ONLY **0.45%** of mine water was discharged into the Hunter River

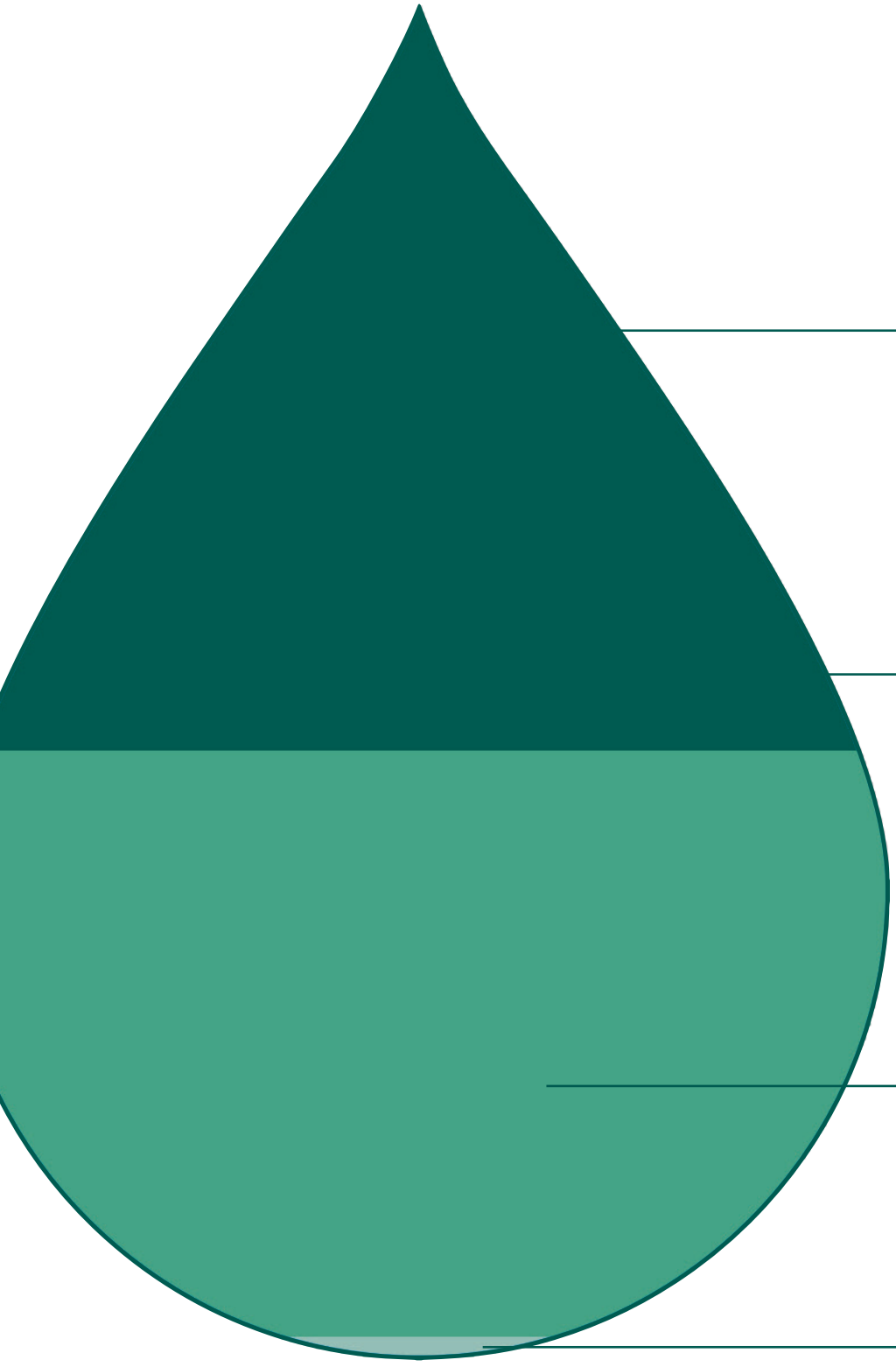
To find out more about the UHMD, visit miningdialogue.com.au

The NSW Minerals Council has compiled the data in this infographic using the best available information. Since water accounting is a complex task that relies on estimates and computer models, there are corresponding limits to the accuracy of the information. Sources: Bureau of Meteorology; DPI Water; NSW Minerals Council data.

THE HUNTER RIVER 2017

A precious water resource for the Upper Hunter community.

NSW MINING Upper Hunter Mining Dialogue



2017 was a drier than average year. That year

204 BILLION LITRES

entered the river system in the Upper Hunter.

42%

of that water stayed in the river.

The amount of water extracted and used by farmers, residents and businesses was

55%

MINING

used less than

3%

of the water in the system.

To find out more, visit miningdialogue.com.au

The NSW Minerals Council has compiled the data in this infographic using the best available information. Since water accounting is a complex task that relies on estimates and computer models, there are corresponding limits to the accuracy of the information. Sources: Bureau of Meteorology; DPI Water; NSW Minerals Council data.

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Agenda Item 8

CURRENT WATER PROJECTS AND OTHER WATER BUSINESS

Current Projects

Please find below an update on the following Dialogue water projects.

HRSTS Study

Please see **Agenda item 6** for more information.

MCA Water Accounting Framework

Please see **Agenda item 7** for more information.

Hunter Valley Bioregional Assessment

Following the release of the Hunter and Gloucester subregions in May/June 2018, these subregions have now been added to the BA Explorer. This resource can be viewed here:
http://explorer.bioregionalassessments.gov.au/

Other Water Business

NSW water reforms

JEWG members were advised at the previous meeting on the NSW Government community consultation on the NSW Water Reform Action Plan, which is aiming to deliver on its responsibility to ensure an equitable and transparent approach to the management of our water for current and future generations.

Legislation was introduced into NSW Parliament in June 2018 via the Water Management Amendment Bill 2018. The Plan is expected to be completed by mid-2019, and this deadline is being driven by commitments in the federal legislation and the Murray Darling Basin Plan. Further, the proposed framework for non-urban water meters in NSW has been released with the policy due to be implemented through regulations that will be consulted on in the third quarter of 2018.

Consultation is currently being undertaken regarding NSW water metering framework, with invitations for comments on the policy and draft regulation from Monday 27 August to Sunday 30 September 2018. Public sessions have recently been held in several locations throughout the state, as well as an upcoming webinar. The metering framework and regulation will be finalised once stakeholder feedback has been received, with the regulation expected to commence on 1 December 2018.

For information about the water reforms consultation and outcomes, please visit:
www.industry.nsw.gov.au/water-reform/consultation.

FOR INFORMATION / DISCUSSION

UHMD Joint Environment Working Group
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Agenda Item 9

DIALOGUE REALIGNMENT UPDATE

Issue

The realignment of the Dialogue's Working Groups is progressing in an effort to better reflect the current priorities of the Dialogue and ensure the initiative remains relevant to the Upper Hunter community.

Background

At the May 2018 JASC meeting, members recommended supporting the proposed realignment of the Dialogue's Working Groups to better reflect the changing priorities of the Dialogue, including:

- Consolidating the remaining Joint Working Groups into a single 'Environment' focused group, covering all key Air Quality, Water and Land Management projects;
- Establishing a new Communications Working Group, consisting of site or company comms specialists to help facilitate Dialogue messaging; and
- Establishing a new Economics and Social Development Working Group to focus on short-term matters of importance to the small to medium enterprise community, such as procurement opportunities and strengthening the economy here and now.

Terms of References for each of the new and consolidated Joint Working Groups have been drafted. Industry-only Working Groups will also support both the Environment, and the Economic and Social Development working groups. Given the bulk of the Terms of Reference are similar, we have not included all five documents. However, the attached document outlines the purpose and composition of each Working Group.

Invites have been sent to targeted representatives at each of the Dialogue's industry partners, with a positive reception to involvement from most parties to date. The Communications Working Group was recently held on 18 September, with the Joint Economic and Social Development Working Group looking to commence in early to mid-October (TBC).

In the economic development area there are two distinct areas of interest. Firstly, the 'short term' matters of importance to the small to medium enterprise community such as procurement opportunities and strengthening the economy now. Secondly, the strategic, 'long term' matters of importance to the wider community, industry and local and state government such as economic diversification, beneficial reuse of final voids and strategic land use planning.

These areas have distinctly different stakeholders, although noting that there may be some overlap. As such, it is proposed that the Economic and Social Working Group be focussed on matters of importance to the small to medium enterprise community and the more strategic areas become within the remit of the Joint Advisory Steering Committee.

Recommendations

- **That JEWG members note the progress made by the Dialogue in establishing the new Working Groups and advise the Dialogue secretariat of any additional representatives or stakeholders that may be required to ensure the continued relevance of the Dialogue.**

FOR INFORMATION / DISCUSSION

Attachment: Purpose and Composition of the Dialogue's new working groups

Please see Agenda item 10 for the Joint Environment Working Group's Terms of Reference Communications Working Group.

Communications Working Group	
Purpose	The purpose of the Communications Working Group is to: ● Work within the Dialogue's approved Communications Plan with the primary aim to increase both community and industry knowledge of the Upper Hunter Mining Dialogue. ● Employ industry technical knowledge and community engagement expertise to deliver relevant communications to audiences both within and outside the Upper Hunter. ● Discuss, and advise on strategies to strengthen stakeholder engagement activities across the Upper Hunter. ● Advise and assist with the form, design and delivery of communications strategies and material, including printed collateral, social and traditional print and broadcast media and community engagement activities. ● Examine and advise on all communications activities to ensure accurate, unbiased, non-confrontational messaging as per the Dialogue's communications strategy.
Composition	**Industry representatives -** Representation will be sought from each of the Dialogue's industry partners. **A representative of NSWMC -** To provide the Secretariat duties and lead discussion in the absence of any designated Chair. **A Community representative** - To provide measured and considered input and advice reflecting the community's perspective.
Invites	Invites sent to all industry and community members.
Meeting	Tuesday 18 September 2018
Industry Working Group	No

Joint Economic and Social Development Working Group	
Purpose	The Joint Working Group for Economic and Social Development is a working group consisting of key Upper Hunter stakeholders. The purpose of the Joint Working Group is to: ● Consider matters of importance to the small to medium enterprise community, such as procurement opportunities and strengthening the economy of the region now. ● Consider the impact of mining activity on a variety of social issues and how the Dialogue can work collaboratively with business, interest groups, councils and industry to build resilience and capabilities in the Upper Hunter community in the short-term. The Joint Advisory Steering Committee will continue to consider more strategic 'long term' matters of importance to the wider community, industry and local and state government such as economic diversification, beneficial reuse of voids and strategic land use planning.
Composition	**Business representatives** - Members from the Singleton, Muswellbrook, Scone,

	Branxton, Denman and Cessnock Chambers of Commerce will provide advice on behalf of the collective business communities operating across the Hunter. **Industry representatives** - Industry will be represented by procurement or other relevant personnel from each of the member companies. Industry representatives will be rotated through the companies that are members of the Dialogue. **Community representatives** - Ideally community representatives drawn from a cross section of stakeholder interests, balancing geographic, business and community interests. **Local government representatives** - A representative from both Singleton Council and Muswellbrook Council, and any other relevant councils if interested. **A representative of NSWMC** - To provide the Secretariat duties.
Invites	Invites sent to industry, business and councils with positive response to date. Seeking community members.
Meeting	Early to Mid-October 2018 (TBC)
Industry Working Group	Yes, typically to meet two weeks prior

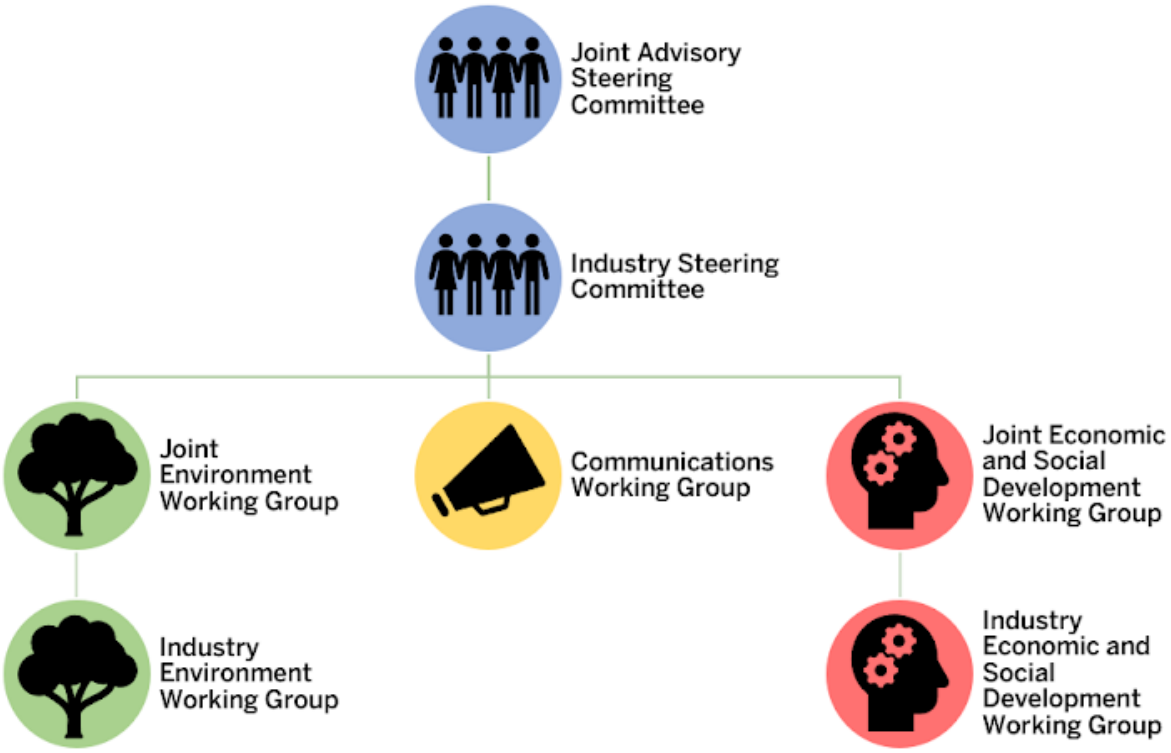

Figure: Revised Dialogue Committee and Working Group Structure 2018

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Agenda Item 10

WORKING GROUP TERMS OF REFERENCE AND MEMBERSHIP

Issue

The recent Dialogue realignment exercise has provided an opportunity to review the composition of existing working groups to ensure they continue to attract the right industry and community representatives to continue to deliver appropriate outcomes for the Dialogue.

Background

Given the consolidation of the two existing Joint Working Groups for Water & Land Management, and Emissions & Health into the Joint Environment Working Group, this meeting provides an opportunity for members to review the composition of both groups to ensure the appropriate contacts are engaged.

The Joint Environment Working Group's Terms of Reference have been **attached** for reference.

The Industry Environment Working Group's Terms of Reference are very similar in format, however remove the additional stakeholders involved.

Membership lists of both groups have also been **attached**.

Recommendation:

- **That JEWG members review the Terms of Reference to ensure these reflect the objectives of the Working Group and provide feedback where necessary to refine the terms of reference and membership composition.**

FOR DISCUSSION

Attachments:
- **Joint Environment Working Group - Terms of Reference**
- **Industry and Joint Environment Working Group Membership Lists**

Attachment: Joint Environment Working Group - Terms of Reference

Upper Hunter Mining Dialogue
Joint Working Group: Environment
DRAFT Terms of Reference
August 2018

Background

The Upper Hunter Mining Dialogue (the Dialogue) commenced in 2010 as a collaborative effort between industry and the community that addresses the cumulative impacts of mining by understanding the local community's concerns, and working together to prioritise, develop and implement solutions.

As an apolitical body, the Dialogue provides information and support to the Upper Hunter community and plays a key facilitator role in bringing stakeholders together and supporting the building of relationships between stakeholders that serve to strength the fabric of the Upper Hunter community.

The Dialogue brings together nine coal producers in the Upper Hunter with stakeholders from state and local government, community and environmental groups, media, education, business and agri-business organisations.

Since the Dialogue's establishment, considerable progress has been made in developing stronger relationships and trust between the industry, community and other stakeholders. In consultation with both the Industry and Joint Advisory Steering Committees, the Dialogue seeks to strengthen the engagement with the community and build on the meaningful progress achieved so far.

It remains a strategic priority to have strong community representation and involvement on the Dialogue's Joint Working Groups that oversee the Dialogue's key projects. The Dialogue hopes that by working together towards a shared objective and outcome, that all parties involved will recognise the benefits and improvements for the region arising from this work.

Purpose of the Joint Environment Working Group

The Joint Environment Working Group (JEWG) consists of a wide range of key Upper Hunter stakeholders, with an interest in discussing and addressing identified environmental issues, as a result of mining activity in the Upper Hunter. Such environmental issues may include, but are not limited to:

Air Quality Emissions & Health
Key goals regarding air quality include:

- Develop a better understanding in the industry and the community of mining related emissions; and
- Manage mining operations to achieve consistent, continuous improvement of mining related emissions levels that goes beyond compliance/operational excellence.

Land Management
Key goals regarding land management include:

- Decrease the time that disturbed areas are left without temporary or final cover, recognising that different mining operations are at different points in rehabilitation, and
- Achieve a consistent level of best practice, quality, integrated rehabilitation across the Upper Hunter - both within the industry and with future land uses - and to be a responsible steward of the land.

Water Quality
Key goals regarding water quality and stewardship include:

- Develop a better understanding of the region's water resources and the existing and potential impacts of development on the Hunter Valley catchment, and
- Demonstrate and promote responsible and efficient use and management of water in the Hunter Valley.

The Working Group may also consider environmental issues that fall outside these three broad categories.

Composition of the Joint Working Group for Environment

The JEWG should consist of:

- **Industry representatives** - Industry representation will rotate through the companies that are members of the Dialogue.
- **Community representatives** - Ideally community representatives drawn from a cross section of stakeholder interests, balancing geographic, business and community interests.
- **Local government representatives** - A representative from both Singleton Council and Muswellbrook Council.
- **State government department representatives** - Representatives from departments with policy areas directly relevant to mines, such as Planning, Primary Industries, EPA, etc.
- **Business representatives** - A representative from both Singleton and Muswellbrook Business Chambers.
- **Environmental and other interest groups** - Representatives from local groups that advocate on environmental issues in the region.
- **Industry association or peak body representatives** - Representatives that are key stakeholders on environmental issues, such as water users, farmers, winemakers etc.
- **Research and academic organisations** - Representatives from the University of Newcastle, and associated institutes.
- **A representative of NSWMC -** To provide the Secretariat duties.

In the event that a member of the JEWG cannot attend a meeting, an alternate will be permitted provided advance notice is given.

Appointments

Appointments to the JEWG will be made by the NSWMC CEO acting on the advice of the Chair of the JEWG.

The NSWMC CEO may also revoke an appointment to the JEWG

Appointment Criteria

Members of the JEWG are to abide by general rules of behaviour. The Dialogue committees and working groups involve a variety of stakeholders coming together to discuss issues in an open and respectful environment. This approach is to be observed by all members of the JEWG.

Members are to disclose any conflicts of interest. In the event that a member is found to have breached the appointment criteria in a material way, the member's appointment may be revoked by the NSWMC CEO acting on the advice of the Chair of the JEWG. In the case of more minor matters, the Chair of the JEWG may issue a warning to the member to comply with the general rules of behaviour or risk being removed from the group.

In addition, the following appointment criteria will apply:

- A demonstrated interest in the Dialogue and its continual improvement.
- A willingness to promote the Dialogue and increase awareness of its work
- A general awareness of contemporary issues and a willingness to provide a balanced view and progressive and collaborative attitude and approach to developing solutions
- The ability to contribute to the strategic framework of the Dialogue

Positions on the JEWG are voluntary.

Appointment length

Appointments to the JEWG will be for as long as is necessary. Appointments will be staggered to avoid appointments expiring at the same time. Initial appointments may be for a shorter or longer period to enable the staggered arrangement to take effect over time.

Committee Chair

The Chair of the JEWG shall be an industry representative appointed by the NSWMC CEO. If the Chair is unavailable, another industry representative shall act as Chair. The Secretariat may step in and act as Chair and lead discussions if no industry Chair is identified or there is a last-minute change required.

Quorum

A quorum exists if over half the members and a representative of the Secretariat are present.

Meeting frequency

The JEWG will meet three times per year and at such other times as the Chair may determine is necessary. Meetings will generally take three hours.

Meeting location

The JEWG will meet at the Dialogue Resource Centre in John St, Singleton, or at any other venue as directed by the Secretariat.

Secretariat support for the Working Group

Secretariat support to the JEWG shall be provided by the NSWMC.

Attachment: Membership Lists of Industry and Joint Environment Working Groups

Industry Environment Working Group (current 19 September 2018)

Julie Thomas	Muswellbrook Coal	julie.thomas@muscoal.com.au
Craig White	Bengalla Mining Co.	craig.white@bengalla.com.au
Genelle Scotts	Bengalla Mining Co.	genelle.scotts@bengalla.com.au
Chris Knight	Bloomfield	cknight@bloomcoll.com.au
Chris Quinn	Bloomfield	cquinn@bloomcoll.com.au
Jonathon Deacon	BHP	jonathon.deacon@bhpbilliton.com
John Watson	Glencore	john.watson@glencore.com.au
Nigel Charnock	Glencore	nigel.charnock@glencore.com.au
Paul Amidy	Glencore	paul.amidy@glencore.com.au
Donna McLaughlin	Malabar	dmclaughlin@malabarcoal.com.au
Ngaire Baker	Mt Pleasant Operation	ngaire.baker@machenergyaustralia.com.au
Merri Bartlett	Peabody Energy	mbartlett@peabodyenergy.com
Peter Jaeger	Peabody Energy	pjaeger@peabodyenergy.com
Bill Baxter	Yancoal	bill.baxter@yancoal.com.au
Phillip Brown	Yancoal	phillip.brown@yancoal.com.au
Bob Mackie	theresource	bob@theresource.net.au
James Barben	NSWMC	jbarben@nswmining.com.au
Craig Milton	NSWMC	cmilton@nswmining.com.au

Joint Environment Working Group (current 19 September 2018)
- including all Industry Environment Working Group members listed above

Admin	Hunter Thoroughbred Breeders	policy@htba.com.au
Arthur Burns	HV Water Users Assoc.	arthur.burns@bigpond.com
Ben Harrison	DPE	benjamin.harrison@planning.nsw.gov.au
Bev Smiles	Hunter Enviro Lobby	bevsmiles@bigpond.com
Karen Marler	NSW EPA	karen.marler@epa.nsw.gov.au
Mark Scandrett	Muswellbrook Council	mark.scandrett@muswellbrook.nsw.gov.au
Matt Parkinson	AGL	Matthew.Parkinson@macgen.com.au
Neville Hodkinson	Singleton Healthy Enviro Group	ssheg@hotmail.com
Sarah Withell	BHP	Sarah.Withell@bhpbilliton.com
Simon Francis	NSW DPI	simon.francis@dpi.nsw.gov.au
Wendy Bowman	Mine Watch NSW	N/A
Brett Keeping	Upper Hunter Winemakers	Brett@tworivers.com.au
Bruce Whitten	HV Water Users	whittenb@bigpond.com
Cameron Archer	Tom Farrell Institute	6579aca@gmail.com
Daniel Lewer	Community	daniel.lewer@hlmaus.com.au
Glenda Briggs	NSW DPI	glenda.briggs@dpi.nsw.gov.au
Greg Woodward	Community	gregspri@gmail.com
Hugh Upward	HV Protection Alliance	hupward@bigpond.com
Ian Napier	Hunter Wine Industry	ian.napier@wombatcrossing.net
Jan Davis	Hunter Enviro Lobby	jandavis280@gmail.com
Janet Fenwick	Community	randjfenwick@bigpond.com
Jim Morgan	Community	jim_morgan@activ8.net.au
Jo Powells	NSW DPI	jo.powells@dpi.nsw.gov.au
John Campbell	Bengalla Mining Co.	john.campbell@bengalla.com.au
Jonathan Moore	NSW Farmers Assoc.	jemoore@activ8.net.au
Karen Marler	NSW EPA	karen.marler@epa.nsw.gov.au
Ken Bray	Hunter Water Users	ken@huntervineyard.com.au
Laurie Perry	Wonnarua Nation Aboriginal Co	l.perry@optusnet.com.au
Leonie Ball	Singleton Beef & Land Assoc.	gregleonie@harboursat.com.au
Mark Slade	Community member	mdslade@skymesh.com.au
Matthew Newton	Resources Regulator	matthew.newton@planning.nsw.gov.au
Monique Meyer	Resources Regulator	monique.meyer@trade.nsw.gov.au
Neil Griffiths	NSW DPI	neil.griffiths@dpi.nsw.gov.au
Neil Nelson	Singleton Beef & Land Assoc.	neil@neilnelsonagvice.com
Peter Ainsworth	NSW Dept Trade & Investment	peter.ainsworth@industry.nsw.gov.au

Ron Fenwick	Community	randjfenwick@bigpond.com
Sean Constable	Upper Hunter Council	sconstable@upperhunter.nsw.gov.au
Simon Turpin	Local Land Services	simon.turpin@lls.nsw.gov.au
Tim Roberts	Tom Farrell Institute	Tim.Roberts@newcastle.edu.au
Tony Cox	NSW Dept Trade & Investment	tony.cox@industry.nsw.gov.au

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Agenda Item 11

2018 FORUM PLANNING

Issue

The 2018 Upper Hunter Mining Dialogue Annual Forum is to be held on Tuesday 20 November 2018. The Dialogue is seeking to improve engagement with members and provide an annual event that generates meaningful discussions and ideas.

Background

Planning for the 2018 Forum is well underway, with the Dialogue seeking to ensure this yearly gathering of key Upper Hunter stakeholders can provide the most value and generate outcomes for the Upper Hunter community, now and well into the future.

Feedback from prior Forums has been generally positive, however the Dialogue secretariat is working to ensure that potential improvements are considered and factored into future events to improve engagement with stakeholders. The 2018 Forum provides an opportunity for all Dialogue stakeholders to come together and learn more about the Dialogue's recent projects and activities through having meaningful discussions, and sharing ideas, comments, or concerns in an environment that understands and acknowledges their contributions and can actively work to address them.

Key criticisms regarding past forums have focused on the perception that the same issues are regularly discussed year to year and that they are hearing from the same people on a regular basis.

The JASC recommended the Dialogue consider moving away from a format with numerous, lengthy presentations or panel discussions, as these are unlikely to generate a significant amount of interest. After a long discussion, the JASC agreed that a change in direction for the Forum is needed. While there will be an initial scene setting presentation on the past year of Dialogue activities since the 2017 Forum, the Forum will then open up and allow attendees to engage with a range of industry, business, academic and other community representatives to learn more about key projects.

One of the key changes will be the inclusion of industry procurement personnel to help SME representatives gain a better understanding of how to access local procurement opportunities. This process will also allow SMEs to identify the barriers they are facing with respect to these opportunities and how the industry might help facilitate programs in this space. The Dialogue is also actively seeking the support of councils and business chambers in promoting the event.

Recommendation

- **That JEWG members note the Forum agenda and provide feedback and/or suggestions where necessary to help guide the Dialogue's plan and prepare for the Forum.**

FOR INFORMATION / DISCUSSION

Attachment: 2018 Forum Agenda

2018 UHMD ANNUAL FORUM

Where: Muswellbrook Race Club, Racecourse Rd, Muswellbrook NSW
When: Tuesday 20 November 2018, 9:00 am to 2:30 pm

Time	Length	Topic	Presenter
8:30 am	25 mins	Arrival and networking. Coffee, tea, muffins available	
8:55 am	5 mins	Welcome to Country	TBD
9:00 am	5 mins	Welcome from Facilitator	Di Sneddon, Facilitator
9:05 am	30 mins	**Dialogue Update:** 'Realignment and Reinvigoration' This update will address the Dialogue's changing priorities as a result of the key issues raised in the 2017 Forum discussion, which included: ● Air Quality and health impacts, ● Rehabilitation and land use planning ● Communications and stakeholder engagement ● Economic diversification and building resilience Update is to introduce each of the stalls featured to provide small amount of information and encourage discussion.	James Barben NSWMC, David O'Brien, UHMD Chair
9:35 am	90 mins	**Networking between attendees and invited guests** Key Dialogue projects will be supported by various project stalls where attendees are free to engage with representatives on a range of issues: 1. Local Procurement and Economic Development 2. School Mine Tours and VR technology 3. Water projects i.e. HRSTS Study & Water Accounting Framework 4. Industry rehabilitation and NSW Government rehabilitation reforms 5. Air Quality issues and Weather Forecasting 6. Synoptic Plan Update 7. Communication projects and other emerging Dialogue issues Invited guests may include: Rae O'Brien, James Tibbett, Richard Bush, Dayjil Fincham, Ken Bray, Matt Newton, Steve Barry, Steve Wills, various Business Chamber reps, Industry procurement and rehabilitation personnel, Dialogue Committee and Working Group Chairs, Mitch Bennett, Karen Marler.	
11:05 am	25 mins	**Morning tea**	
11:30 am	30 mins	**In-table discussion on the projects** Attendees will discuss what they have learnt from the morning networking session amongst their tables, identifying their Top 3 ideas or projects to address them.	
12:00 am	70 mins	**Feedback and Discussion** (5 mins presentation and 5 mins Q&A per group) Feedback generated from the in-table discussions will be discussed further to help guide future Dialogue actions. Participants will then get to have their say on priority projects.	
1:10 am	10 mins	Summary of Forum Outcomes	Di Sneddon, Facilitator
1:20 pm	10 mins	Forum Closing Remarks	David O'Brien, Chair UHMD
1:30 pm	60 mins	Lunch - outside BBQ and networking	
2:30 pm		**Forum Close**	

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Agenda Item 12

SYNOPTIC PLAN REVIEW UPDATE

Issue

The Synoptic Plan Review is currently underway. Members recently met to discuss the progress made on the plan and revisit whether the review is proceeding along the objectives agreed at the 2017 Workshop.

Background

At previous Dialogue meetings in May/June 2018, Dialogue members expressed concerns regarding the progress of the Synoptic Plan review, encouraging a continued coordinated government approach to strategic long-term land use planning in the Upper Hunter. Members supported writing to, and meeting with the key government agencies involved to express the views of the Dialogue and encourage ongoing support for the review process.

Following both Dialogue and industry discussions, NSWMC recently wrote a letter to Stephen Barry (NSW Department of Planning) to encourage the continued development of the Upper Hunter Landscape Visualisation Project, citing the significant interest from community and industry for the continuation of this project, given the value which a visual projection of the future landscape has in communicating the post mining landform.

A second Synoptic Plan workshop was recently held on 3 August 2018 at Singleton Diggers. The review was well supported politically with Michael Johnsen MP and Clayton Barr MP attending. Updates were provided from the various government departments that are working on aspects of the review and it appears some progress has been made. However, there appears to be a declining involvement from community members in the review process.

DPC advised during the workshop that the Synoptic Plan content will be housed on the Hunter Joint Organisation of Councils website: http://strategicservicesaustralia.com.au/joint-organisation/timeline/

Feedback was provided by workshop participants on the priorities of the key actions from the Hunter Regional Plan and also on gaps that were not addressed by the Regional Plan.

The Dialogue will continue to seek the government's support for both the Synoptic Plan review process and the Upper Hunter Landscape Visualisation project and will seek to have the government attend the 2018 Forum to update participants on any progress made since the August 2018 Workshop.

Recommendation

- **That JEWG members provide feedback on the Synoptic Plan review, taking into account the outcomes of the recent workshop.**

FOR DISCUSSION

UHMD Joint Environment Working Group
26 September 2018

Agenda Item 13

UPDATE ON COMMUNICATIONS ACTIVITIES

Issue

The Upper Hunter Mining Dialogue continues to progress projects and initiatives through the Dialogue's communication strategy in 2018.

Background

Please see below for an update on key activities:

A. General Communications Update

Recent activities have been dominated by the roll out of the 2018 School Mine Tours Program:

Media/communication plans:

- Since the first tours in May the program has fielded 8 tours involving 234 students from 11 primary schools. The tours have been outstanding successes with all mines involved (Mt Owen, Mangoola, Ravensworth, Mount Thorley Warkworth, Wambo and Muswellbrook Coal) putting in a fantastic effort and drawing very good feedback from the students and teachers. Three tours were postponed due to wet weather (including one tour rained out twice) with one tour successfully rescheduled. The other postponed tour is yet to be rescheduled due to school commitments. A new round of tours has recommenced in September with the 5 remaining primary school tours (including the tour yet to be rescheduled) before the 12 scheduled high school tours roll out in October/November. At this stage, we expect the full 2018 program to include 25 tours and almost 900 students from 17 schools.
- The Dialogue website has been updated to include recent results and developments in projects. The Dialogue secretariat will now look to ensure that all new content, including Joint Working Group minutes and papers, as well as other relevant reports are uploaded to the site in a timely Fashion.
- A Dialogue Facebook page has recently been activate, and content will be published regularly. Please visit https://www.facebook.com/UPPERHUNTERMININGDIALOGUE/ for further information. The Dialogue will seek to leverage off other information sources where relevant.
- A four-page newsletter has been produced and is being distributed both electronically and in print to all Dialogue stakeholders. Please find this **attached** following the update.
- Industry and community members have been invited to participate in the new Communications Working Group; with the first meeting of the working group held on 18 September (see **Agenda item 9** Dialogue realignment update for further information).

Recent Media:

- The School Mine Tours Program has generated positive media coverage with Fairfax running multiple articles and photos in print and online. @thecoalface has also supported the program with good coverage – including a photo on the cover of its June/July edition.
- An article was prepared for @TheCoalface highlighting the Dialogue realignment, and to promote the upcoming 2018 Forum. This will run in the upcoming edition, with regular promotion of the Forum scheduled until November.

Community Engagement:

The Dialogue was on display at the NSW Mining HSEC Conference on August 6 and 7, and more recently at the Broke Village Fair on September 9. Upcoming community events include the Singleton Show September 27-28.

B. Targeted Stakeholder Meetings Update

The Dialogue's Chair and Secretariat has commenced a targeted stakeholder engagement via a series of meetings with priority local interest and environment groups and Community Consultative Committees.

The meetings to date have provided an opportunity to discuss and learn more about the current priorities and issues various stakeholders have and exchange information on the Dialogue's current activities and whether any issues or projects identified may be supported through the Dialogue's ongoing work. All members have been invited to attend Dialogue Working Groups and the 2018 Forum and added to the Dialogue's Stakeholder contact list to ensure they remain engaged in the Dialogue's updates.

Recent meetings that have occurred since the previous JASC meeting include:

- Stewart Ewen (representing the Hunter Valley Protection Alliance, Hunter Valley Wine and Tourism Alliance, and the NSW Wine Industry Association) - Topics discussed included the Dialogue needing to tackle long-term land use concerns and helping the region's residents better share in the benefits of the industry. The Dialogue was encouraged to participate in several projects focused on strategic land use planning and tourism that are currently underway by the Wine Industry Association and Lock the Gate, which will look at the perception of environmental impacts from mining on the wine sector and local tourism. Mr Ewen advised he would participate in the Dialogue when time permits.
- Jan Davis and Bev Smiles (representing the Hunter Environment Lobby) - Topics discussed included the perceived influence of industry on the independence of the Dialogue, and the need for more considered communication of Dialogue projects to reflect the community. Cumulative impacts of mining were discussed, although it was noted that the visual amenity in the region has recently improved. Strategic planning and the mine closure process was also discussed with Ms. Davis and Ms. Smiles expressing an interest in the economic diversification work being undertaken and were offered a guided tour of a mine site that is undergoing the closure process.
- Malabar Coal CCC - Chaired by Jennifer Lecky, this involved engagement with 4 community members, with general interest in the Dialogue's actions, in particular the grazing study.
- Georgina Woods and Danielle Coleman (representing Lock the Gate) - This discussion provided an opportunity to talk through some of the Dialogue projects the Dialogue is progressing. LTG advised that they would consider attending the annual forum in 2018.
- Muswellbrook Race Club - The Dialogue secretariat had a tour of the 2018 Forum venue to prepare for logistics, however had a discussion regarding local procurement and the difficulties faced by local businesses in accessing these opportunities.
- Muswellbrook Coal Comapny CCC – Chaired by Rod Scoles, this involved engagement with three non-industry members, with interest in the land management projects.
- Ravensworth Operations CCC - Chaired by Wej Paradice, this meeting involved engagement with three non-industry members from Council and five industry members. There was significant interest in the Dialogue's realignment and new organisational structure, as well as how projects were undertaken.

Further meetings will be scheduled shortly with additional stakeholders and CCC's to ensure the Dialogue continues to re-engage with the following community organisations:

- Hunter Thoroughbred Breeders Association
- Hunter Joint Organisation of Councils'
- NSW Farmers Association
- HunterNet
- Bulga Milbrodale Progress Association
- CFMEU

A revised newsletter (attached) was recently emailed out to nearly 300 Dialogue stakeholder contacts, including the priority engagement contacts, to provide an update on the recent activities undertaken by the Dialogue. This is intended to be a bi-annual update, with another to be prepared for distribution in early December 2018 summarising the Forum and progress made in projects towards the end of 2018.

FOR INFORMATION

Attachment: Dialogue Newsletter July 2018

July 2018 News

Upper Hunter Mining Dialogue

IN THIS EDITION

SCHOOL MINE TOURS PROJECT HITS THE ROAD

UPPER HUNTER MINES BECOME GIANT CLASSROOMS FOR STUDENTS

The Upper Hunter Mining Dialogue's School Mine Tours Program is back on the road for 2018.

The School Mine Tours Program started its busy 2018 schedule in May.

This year the program is scheduled for 25 individual tours which will see an estimated 1000 Year 5 and Year 9 students from 18 participating Upper Hunter schools tour 13 mine sites across the Upper Hunter.

The tours program aims to offer a fact-based, first-hand educational experience to teach local students about the impacts and benefits of coal mining in the Upper Hunter.

The Dialogue offers the free tours to all schools in the Singleton-Muswellbrook educational catchment and the program uses educational materials and messaging developed by a Dialogue working group made up of teachers, community members, industry and local government representatives.

Above: King Street Primary School students at Mt Owen Mine in May 2018.

DIALOGUE WORKING TOGETHER

The Upper Hunter Mining Dialogue was established in 2011 by the region's miners in response to community concerns about infrastructure and services, mine rehabilitation, water and air quality.

The Dialogue is a collaborative effort that addresses the local community's priorities by understanding its concerns and then working together to develop and implement solutions.

Focus areas include: Water and Land Management, Emissions and Health, Social Impacts and Infrastructure.

The Dialogue is guided by its Joint Advisory Steering Committee and working groups which include community, industry and government representatives.

Upper Hunter Mining Dialogue
Unit 8 First Floor
Town Square Centre
159 John Street
Singleton NSW 2330

miningdialogue.com.au

Upper Hunter Mining Dialogue

July 2018 News

Upper Hunter Mining Dialogue

STUDY MEASURES WATER USE

NEW FIGURES SHOW INDUSTRY RELATIVELY SMALL USER OF RIVER WATER

The Upper Hunter mining industry is a relatively low user of water flowing through the Hunter River, according to annual figures recently released by the Upper Hunter Mining Dialogue

In 2016 the mining industry used just two per cent of the water in the Hunter River system according to the latest figures collated by the Dialogue's water accounting project. This compares to 36 per cent extracted from the river and used by non-mining businesses and residents.

The water accounting project's results also show most of the water used by the mining industry comes from sources other than the river.

The mines sourced 55 per cent of all the water they used from onsite rainfall and runoff and a further 28 per cent was sourced from deep aquifers that are of limited used to other water users due to their high salinity.

Almost half the water – 47 per cent - used in the mining sector was recycled and re-used.

The water accounting project was initiated through the Dialogue to gain a better understanding of mining's interaction with water resources in the region and identify opportunities for water management.

The water accounting project focuses on the Hunter River and its tributaries from Glenbawn Dam downstream to Singleton – where Upper Hunter mines and the major water supply dams are located – and collects the water usage data annually.

Upper Hunter mines get their water from a variety of sources and must be licenced for any water they take from rivers and groundwater.

According to the data released by the Dialogue, only 10 per cent of the water used by mines came from rivers and alluvial aquifers.

DIALOGUE LOOKS FOR MORE LOCAL REPRESENTATIVES

The Upper Hunter Mining Dialogue is looking for people who want to help make the Upper Hunter a better place for all to live. There are a number of community representative positions available on the Dialogue's Joint Working Groups.

The working groups meet quarterly and play an important role by helping the Dialogue choose and implement its strategies and activities including projects aimed at addressing mining impacts in areas such as air and water quality, land management and rehabilitation and planning the Hunter of the future.

The Dialogue is inviting community members for expressions of interest in joining the Land and Water Management and Emissions and Health Joint Working Groups.

Community representatives can express their interest in joining the Dialogue via email at **info@nswmining.com.au**

A new video illustrates and explains how Upper Hunter mine sites alter their operations to minimise dust impacts as part of the Dialogue's successful Weather Forecasting Project. The Clearing the Air video can be viewed at: youtube.com/watch?v=q4TojwxKVRQ

DIALOGUE PROJECTS

The Dialogue has a number of ongoing projects as well as successful outcomes from past projects.

Current projects include:

- School Mine Tours
- Hunter River Water Quality Study
- Synoptic Plan Review
- Involvement in the Rehabilitation and Mine Closure Working Group
- Air Quality Factsheet

Ongoing and past projects include:

- Cattle Grazing Trials
- Weather Forecasting Project
- Clearing the Air Video
- Community Engagement
- Water Accounting Framework
- Rehabilitated Land Annual Report
- Community Research
- Social Housing

Full details of all Dialogue projects can be found at our website at: www.miningdialogue.com.au

MAJOR PROJECT TESTS RIVER WATER QUALITY

RIVER AND STORAGE WATER TESTED FOR CONTAMINANTS

In a major project for the Upper Hunter Mining Dialogue, river and mine storage water quality has been tested in multiple locations in the Upper Hunter.

Organised and funded by the Dialogue, the study was undertaken by the University of Newcastle's International Centre for Balanced Land Use with input from the Environment Protection Authority.

Through analysis of water and sediment samples from mine water storage sites as well as from the Hunter River, the project assessed the quality of water being released from coal mines and power utility facilities operating under the Hunter River Salinity Trading Scheme.

The Dialogue sees the water quality study project fitting perfectly into its brief to work towards reducing mining impacts on the community.

The Dialogue's research shows water quality is a concern for the community and the study allowed the collection of data on the current quality of the river water as well as assessment of potential risks, if any, for the future.

July 2018 News

Upper Hunter Mining Dialogue

ENGAGING WITH COMMUNITY

DIALOGUE GOES FACE TO FACE TO SPREAD THE MESSAGE AND LEARN ABOUT EMERGING ISSUES

The Upper Hunter Mining Dialogue is coming to an event near you!

As part of its quest to keep in touch with the community and up to date with issues, the Dialogue attends many local shows and events.

The Dialogue display features educational posters and reading materials and is manned by Dialogue members who are available to explain the role of the Dialogue and how its projects aim to make life better in the Upper Hunter.

At the community events, the Dialogue also conducts community surveys which track knowledge of the Dialogue and what the community sees as priorities.

Want to know more about the Dialogue?

Full details about the Upper Hunter Mining Dialogue are available at the Dialogue's website: **www.miningdialogue.com.au**

The website includes full details on all projects, industry, community and government partners and the latest activities of the Dialogue.

If you would like to catch up face to face, the Dialogue also has an office in Singleton at the Upper Hunter Mining Dialogue Resource Centre, Suite 8, First Floor, Town Square Centre, 159 John Street, Singleton.

The office also offers free meeting facilities and hot desks to industry partners and community groups.

GRAZING TRIAL BEEFS UP WEIGHT

TRIAL SHOWS VIABILITY OF REHABILITATED MINED LAND

The Upper Hunter Mining Dialogue's Cattle Grazing Trial has shown rehabilitated mining land can be commercially viable as grazing land. The trial saw cattle grazed on mined land at Mt Arthur and Hunter Valley Operations mines with their weight gains compared to cattle grazed on adjacent paddocks that had never been mined. The four-year study, conducted and monitored by the NSW Department of Primary Industries, showed that not only could rehabilitated mine land sustain commercial grazing - cattle on the rehabilitated land actually put on more weight than the cattle on the unmined land.

UHMD Joint Environment Working Group
26 September 2018

Agenda Item 14

UPPER HUNTER DUST RISK FORECASTING SCHEME

Issue

As JEWG members may be aware, the EPA has been developing its dust risk forecasting system for the Upper Hunter and has now decided on how the system will be implemented.

Background

At the March 2018, Joint Working Group for Emissions & Health, members received an update from Mitch Bennett at the EPA on the Dust Risk Forecasting Scheme that the EPA has been working on.

The presentation was well received, and Mr. Bennett sought feedback on the direction for the program after outlining the challenges that were experienced in conducting the modelling. The following key points were discussed during the briefing:

- Air quality in the region is generally good with 80-90% of days in Singleton and Muswellbrook being good to very good. This makes it a difficult process to identify the small percentage of days that may be a high risk for dust generation.
- The model is set up to identify a 25 microgram increase in PM10 from Merriwa to Singleton.
- OEH trialled two models over three months.
- The models use weather forecasts as an input which proved problematic in accurate forecasting.
- During the trial period both models accurately predicted a high-risk day once from the four occurrences.
- Reasons for the missed predictions included inaccurate weather forecasts, lower than expected production and modelling issues. The forecasts may complement site specific forecasting information and may be of use to industry in preparing for high risk days.

The EPA recently announced that from 1 September 2018, a system will be implemented to notify the industry and the community of potentially high-risk dust days as well as using the system to guide the EPA's inspection program. The intent is to increase general awareness of these high-risk days and ensure mines are complying with their regulatory requirements.

The EPA is planning to notify the community of high-risk days via Twitter. For mining operations, the EPA has developed a system whereby nominated contacts at each mine will be directly notified via email, which will contain an automatically generated forecast at 3pm for the subsequent day. It is understood that there have been some technical difficulties in administering these emails initially, however sites have reported regular forecast emails being received in the interim.

The EPA has advised that they have stepped away from using the system as a regulatory tool given the inaccuracies encountered in the predictive model and the potential for false alarms, however it will be used to inform their regular inspections.

Recommendation

- **That JEWG members note the recent introduction of dust risk forecasting measures in the Upper Hunter and provide feedback on how these notifications have been received.**

FOR INFORMATION/DISCUSSION

UHMD Joint Environment Working Group
26 September 2018

Agenda Item 15

UPPER HUNTER AIR QUALITY MONITORING NETWORK UPDATE

Issue

The Upper Hunter Air Quality Monitoring Network (UHAQMN) regularly provides high-quality, regional air quality monitoring information on the Upper Hunter.

Autumn 2018 Seasonal Update (1 March to 31 May 2018) (report attached)

Upper Hunter air quality for 1 March to 31 May 2018 was generally good. Muswellbrook and Singleton large population sites recorded very good to fair air quality indices for 96% and 98% of time, respectively. Key findings during this period are outlined below:

- Levels of fine particulate matter $PM^{2.5}$ (particles less than or equal to 2.5 microns in diameter), nitrogen dioxide (NO2) and sulfur dioxide (SO2) were below national benchmark concentrations.
- Daily average levels of PM^{10} (particles less than or equal to 10 microns in diameter) were above the 50 µg/m3 benchmark on 17 days (18–20 March 11–13 and 15 April, and 4, 8–11, 18–22 May). This was more days compared to previous autumns. Regional maximum daily PM^{10} levels on these days ranged from 51.5 to 84.0 µg/m3.
    - All sites in the region recorded one or more days over the benchmark. This ranged from one day at Merriwa to 12 days at Camberwell (Table 1, see below).
    - Conditions in the region continued to be dry and warm, resulting in particle impacts predominantly from local and long-range dust (rather than fires) during the season. A large portion of NSW is drought affected, with a high number of widespread dust storms seen in autumn.
    - The most extensive events occurred on 19 March and 15 April, being exceptional events due to long-range dust transport. On 19 March, 35 air quality monitoring stations in the NSW network recorded PM10 levels over the benchmark. A dust storm was reported on 18 March through Canberra, travelling out to the east coast and impacting the Upper Hunter from later that night under south east winds. On 15 April, PM^{10} levels over the benchmark were recorded at all Hunter air quality monitoring stations along with Tamworth, Gunnedah and Narrabri. The region was impacted by long-range dust from the State's west on this day.
    - The larger population sites recorded PM^{10} levels over the benchmark on 19 March (Aberdeen and Singleton), 20 March (Aberdeen and Muswellbrook), 11 April (Muswellbrook), 15 April (all three), and 4 May (Muswellbrook). On 11 April, Muswellbrook was possibly impacted by smoke (with $PM^{2.5}$ also increasing), however no source yet identified. On 4 May, Muswellbrook and southern sites were most likely impacted by local dust under elevated west to north west winds. April and May had amongst the highest dust activity in NSW since DustWatch commenced in 2005.

Recommendation

- **That JEWG members note the latest UHAQMN results for Autumn 2018.**

FOR INFORMATION

Air quality in the Upper Hunter: Autumn 2018

Upper Hunter air quality for 1 March to 31 May 2018 was generally good. Muswellbrook and Singleton large population sites recorded very good to fair air quality indices for 96 and 98% of time, respectively.

- Levels of fine particulate matter $PM_{2.5}$ (particles less than or equal to 2.5 microns in diameter), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) were below national benchmark concentrations.
- Daily average levels of PM_{10} (particles less than or equal to 10 microns in diameter) were above the 50 µg/m^3 benchmark on 17 days (18–20 March, 11–13 and 15 April, and 4, 8–11, 18–22 May). This was more days compared to previous autumns (Figure 11). Regional maximum daily PM_{10} levels on these days ranged from 51.5 to 84.0 µg/m^3.
  - All sites in the region recorded one or more days over the benchmark. This ranged from one day at Merriwa to 12 days at Camberwell (Table 1).
  - Conditions in the region continued to be dry and warm, resulting in particle impacts predominantly from local and long-range dust (rather than fires) during the season. A large portion of NSW is drought affected (Figure 2), with a high number of widespread dust storms seen in autumn[1].
  - The most extensive events occurred on 19 March and 15 April, being exceptional events due to long-range dust transport.
    - On 19 March, 35 air quality monitoring stations in the NSW network recorded PM_{10} levels over the benchmark. A dust storm was reported on 18 March[1] through Canberra, travelling out to the east coast and impacting the Upper Hunter from later that night under south east winds.
    - On 15 April, PM_{10} levels over the benchmark were recorded at all Hunter air quality monitoring stations along with Tamworth, Gunnedah and Narrabri. The region was impacted by long-range dust from the State's west on this day. More details on this event are found in a section below.
  - The larger population sites recorded PM_{10} levels over the benchmark on 19 March[2] (Aberdeen and Singleton), 20 March (Aberdeen and Muswellbrook), 11 April (Muswellbrook), 15 April (all three), and 4 May (Muswellbrook). On 11 April, Muswellbrook was possibly impacted by smoke (with $PM_{2.5}$ also increasing), however no source yet identified. On 4 May, Muswellbrook and southern sites were most likely impacted by local dust under elevated west to north west winds[3]. April and May had amongst the highest dust activity in NSW since DustWatch commenced in 2005[1].

Annual air quality trends in the Upper Hunter

A comparison of annual average PM_{10} and $PM_{2.5}$ levels shows the long-term trends. The national annual average benchmarks are 25 µg/m^3 for PM_{10} and 8 µg/m^3 for $PM_{2.5}$, based on a calendar year.

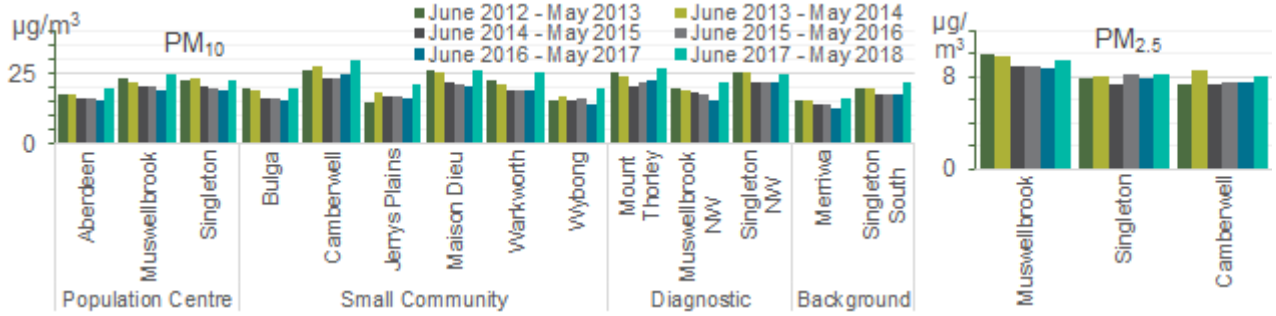

Figure 1 PM_{10} and $PM_{2.5}$ rolling annual averages to the end of autumn: 2013 to 2018

[1] DustWatch report March 2018, DustWatch report April 2018 and DustWatch report May 2018
[2] There was a datalogger fault at Muswellbrook from 16-19 March. Hourly PM_{10} data from 19 March 13:00 was elevated.
[3] This day was proceeded by a widespread dust storm in NSW driven by strong winds - DustWatch report May 2018.

Figure 1 shows the PM_{10} and $PM_{2.5}$ *rolling* annual averages, based on the 12-month periods, from autumn to autumn for 2013 to 2018.

The comparison shows that the rolling annual average PM_{10} particle levels increased at the end of autumn 2018 compared to previous years, with levels similar to or higher than in the earlier years 2013 and 2014. Many NSW regions, including the Upper Hunter, experienced low rainfall over the past 12 months and are drought affected (Figure 2). The extended dry periods experienced in the Upper Hunter during winter to early spring 2017 and summer to autumn 2018, in addition to long-range dust from drought affected areas in New South Wales, would have contributed to the increase in the particle rolling annual averages observed within the region.

For $PM_{2.5}$, rolling annual average particle levels remained similar to previous years.

Rolling annual averages are not intended to be compared to the annual benchmarks. The rolling annual averages provide a guide to long-term trends, using the most up to date monitoring data.

The annual averages for the 2011 to 2017 calendar years can be found in the Upper Hunter summer 2017–18 seasonal newsletter.

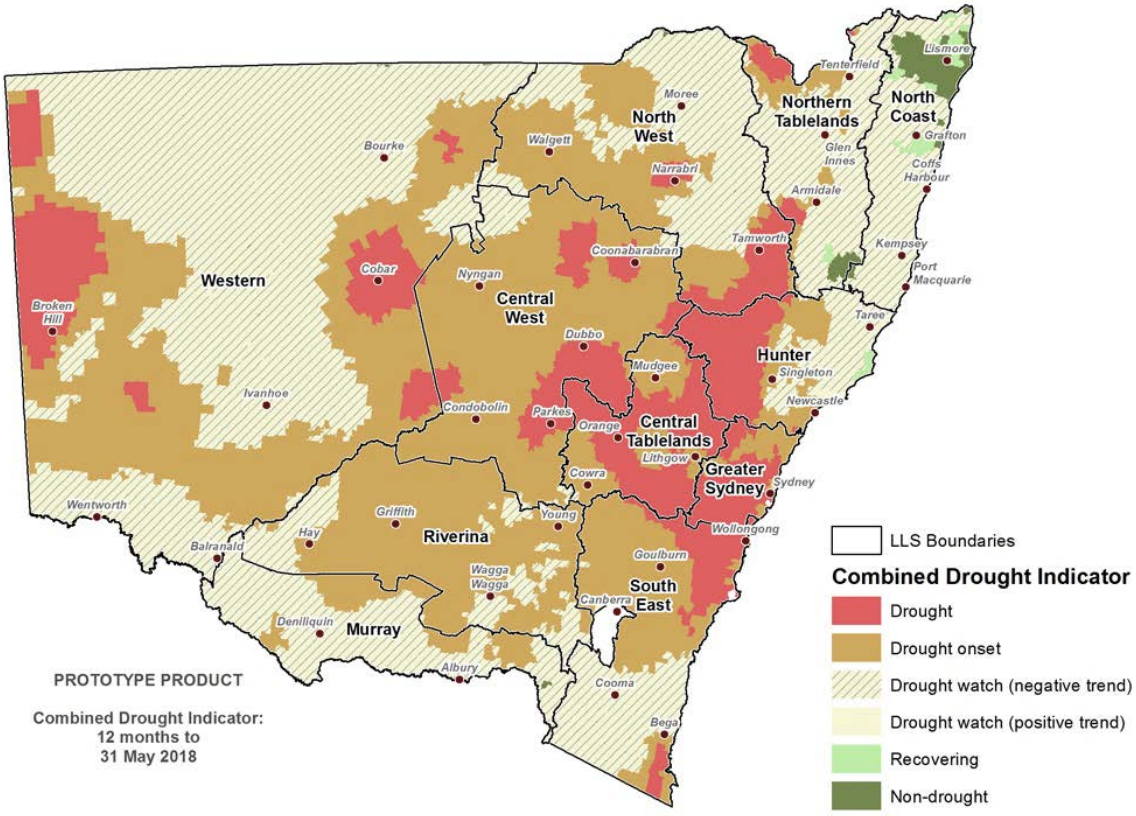

Figure 2 Department of Primary Industries NSW Combined Drought Indicator to 31 May 2018[4]

[4] Sourced from Department of Primary Industries NSW State seasonal update - May 2018 (accessed July 2018).

Days above benchmark concentrations

There was were 17 days over the PM_{10} benchmark during autumn 2018.

Table 1 Number of days above the relevant national benchmarks – autumn 2018

Station type*	Station	PM_{10} daily [50 µg/m^3 benchmark]	$PM_{2.5}$ daily [25 µg/m^3 benchmark]	SO_2 hourly [20 pphm benchmark]	SO_2 daily [8 pphm benchmark]	NO_2hourly [12 pphm benchmark]
Population centre	**Aberdeen**	3	-	-	-	-
Population centre	**Muswellbrook**	4	0	0	0	0
Population centre	**Singleton**	2	0	0	0	0
Smaller community	**Bulga**	2	-	-	-	-
Smaller community	**Camberwell**	12	0	-	-	-
Smaller community	**Jerrys Plains**	3	-	-	-	-
Smaller community	**Maison Dieu**	5	-	-	-	-
Smaller community	**Warkworth**	4	-	-	-	-
Smaller community	**Wybong**	2	-	-	-	-
Diagnostic	**Mount Thorley**	7	-	-	-	-
Diagnostic	**Muswellbrook NW**	3	-	-	-	-
Diagnostic	**Singleton NW**	6	-	-	-	-
Background	**Merriwa**	1	-	-	-	-
Background	**Singleton South**	2	-	-	-	-

µg/m^3 = microgram per cubic metre and pphm = parts per hundred million by volume (i.e. parts of pollutant per hundred million parts of air)

- = not monitored * For explanation, refer to the end of the report Definitions: Upper Hunter monitoring station types

Pollution roses

The seasonal PM_{10} pollution rose map[5] shows a small percentage of elevated hourly PM_{10} levels occurred at most sites. These were generally from the north west, in particular at the south-east sites but also at the Merriwa background site. This shows elevated particles from outside the region.

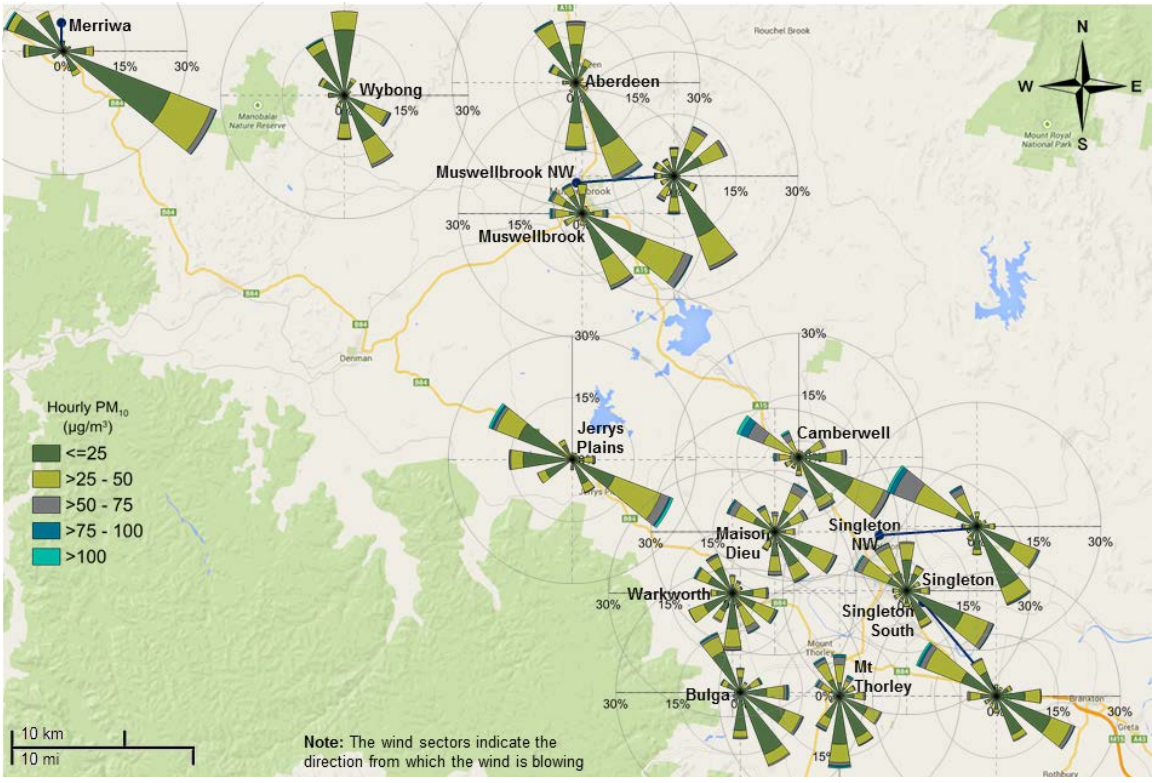

Figure 3 Hourly PM_{10} pollution rose map for the Upper Hunter region for autumn 2018

[5] Pollution roses show wind direction and particle levels at a location. The length of each bar around the circle shows the percentage of time the wind blows from a particular direction. The colours along the bars indicate categories of particle levels (as outlined in the key).

Daily time series plots

Daily average time series plots for PM_{10} and $PM_{2.5}$ and daily one–hour maximum plots for NO_2 and SO_2 show the daily concentrations throughout the autumn season.

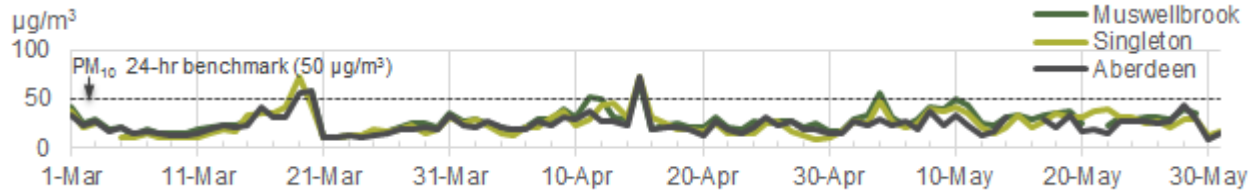

Figure 4 **Population centre sites: daily average PM10 – autumn 2018**

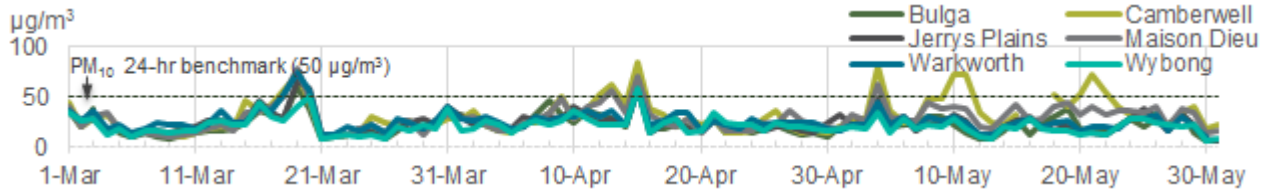

Figure 5 **Smaller community sites: daily average PM10 – autumn 2018**

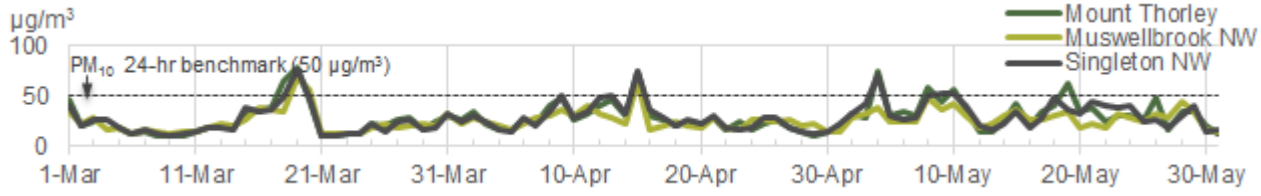

Figure 6 **Diagnostic sites: daily average PM10 – autumn 2018**

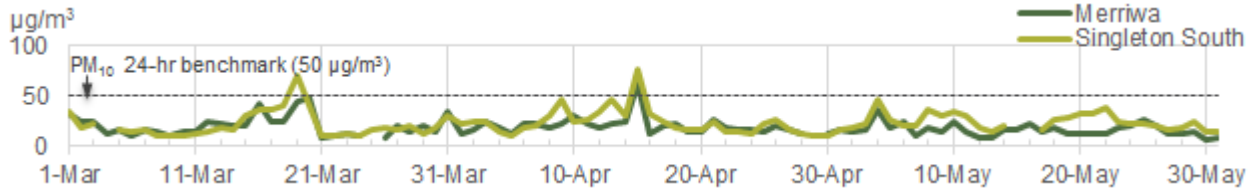

Figure 7 **Background sites: daily average PM_{10} – autumn 2018**

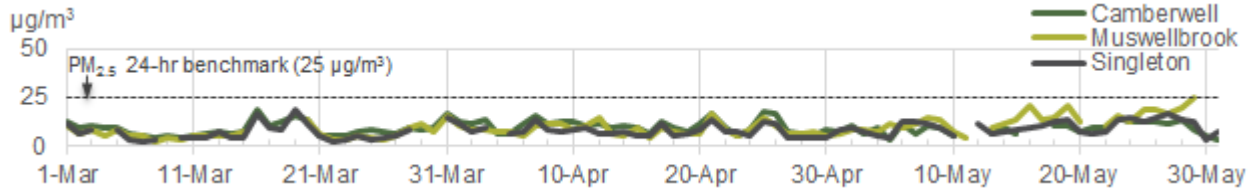

Figure 8 **Daily average $PM_{2.5}$ – autumn 2018**

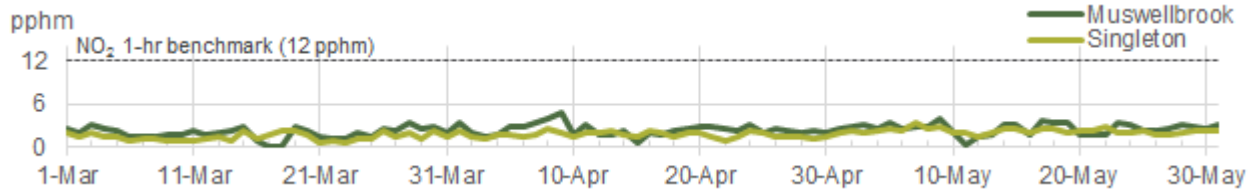

Figure 9 **Daily 1-hr maximum NO_2 – autumn 2018**

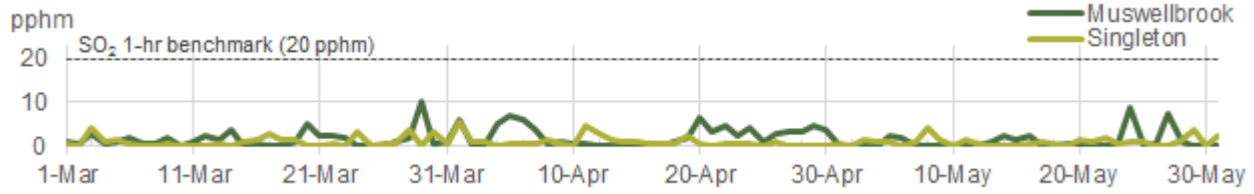

Figure 10 **Daily 1-hr maximum SO_2 – autumn 2018**

Seasonal comparisons

This section compares air quality levels in autumn 2018 with previous autumn seasons.

All days were below the national benchmark concentrations for NO_2 and SO_2 in autumn in the past seven years.

All days were below the daily average $PM_{2.5}$ benchmark at all sites during autumn 2018, which is the same as autumns 2012 to 2015. During autumn 2017 there was one day over the $PM_{2.5}$ benchmark at Singleton and Muswellbrook, while during autumn 2016 there were two days at Singleton.

The daily average PM_{10} concentrations were above the benchmark on 17 days during autumn 2018. This is higher compared to previous autumn periods from 2012 to 2017, which recorded between one to eight days over the benchmark.

The Upper Hunter experienced drier conditions in autumn 2018 compared to the autumn 2017 and autumn 2015, while similar or wetter compared to autumn 2016. These dry conditions, with long-range and local dust transport contributed to elevated particle levels in the region.

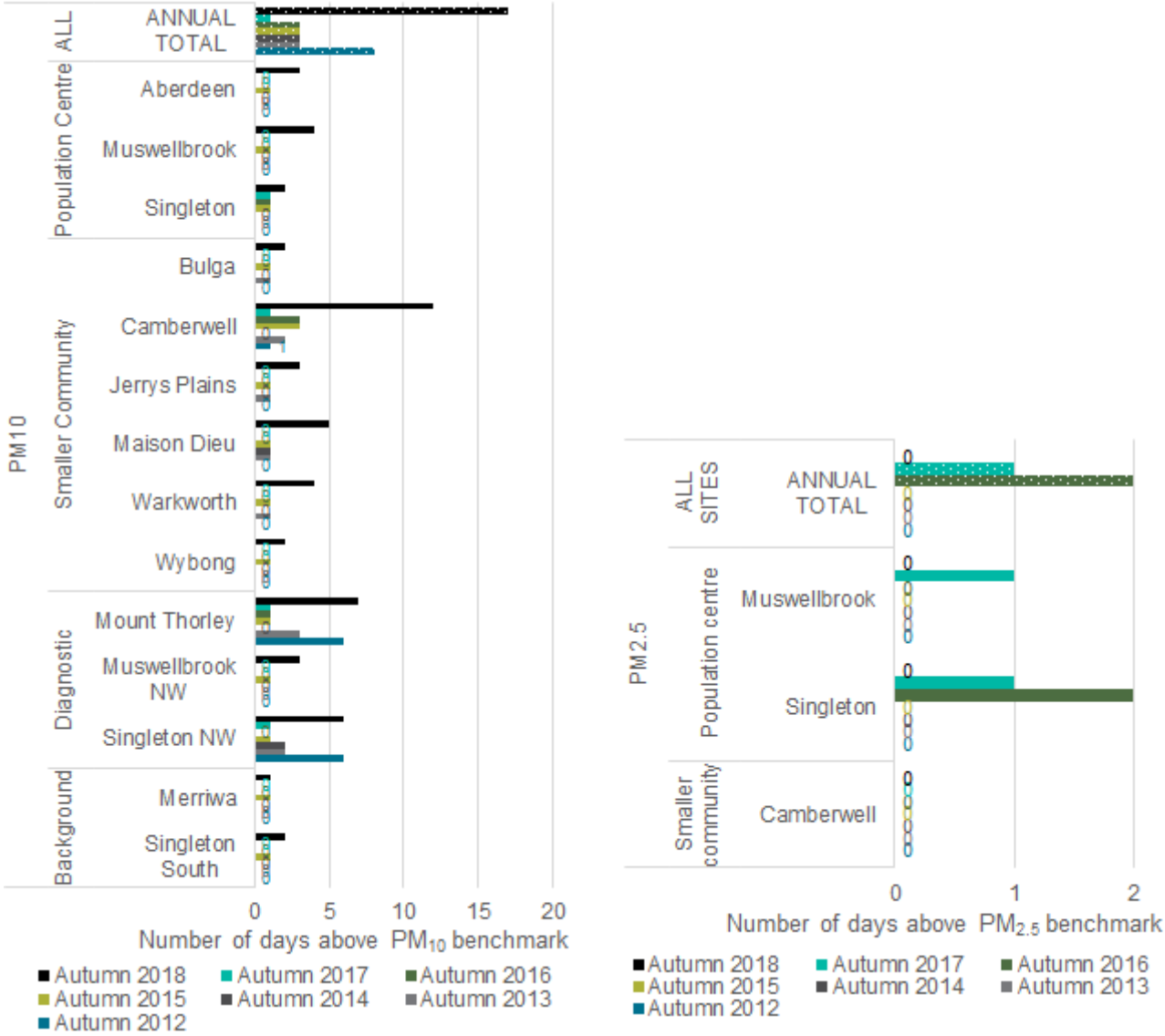

Figure 11 **Number of days above the PM_{10} and $PM_{2.5}$ benchmarks during the 2013 to 2018 autumn seasons**

Particle air quality trends in the Upper Hunter

Figure 12 and Figure 13 show daily average levels of PM_{10} during autumn 2018, compared to the daily maximum and minimum (i.e. shaded range) of PM_{10} levels for the autumn periods from 2011 to 2017, at Singleton and Muswellbrook. Daily PM_{10} levels in autumn 2018 were generally within the same levels as earlier years in March and April and also May for Singleton. Long-range dust impacts on 19 March and 15 April resulted in larger peaks outside of the previous years' range. Levels were often higher than historical data at Muswellbrook in May, however still predominantly below the benchmark. Seasonal rainfall was below average, with particularly dry conditions in April and May (Figure 14).

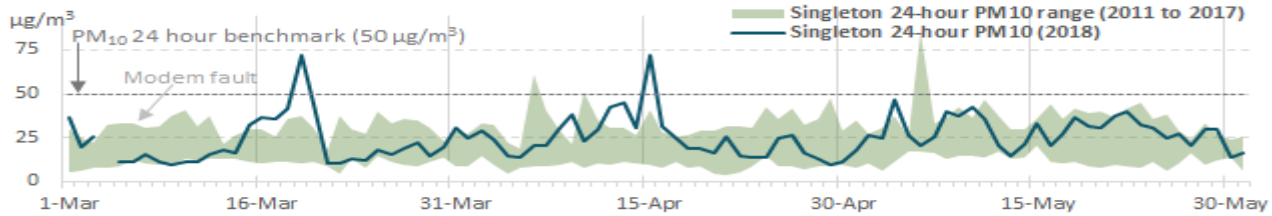

Figure 12 **Singleton daily average PM_{10} during autumn 2018 plotted against the daily maximum and minimum PM_{10} levels recorded from autumns 2011 to 2017**

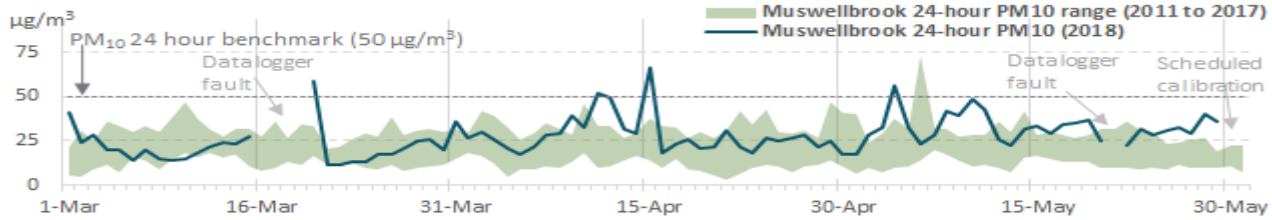

Figure 13 **Muswellbrook daily average PM_{10} during autumn 2018 plotted against the daily maximum and minimum PM_{10} levels recorded from autumns 2011 to 2017**

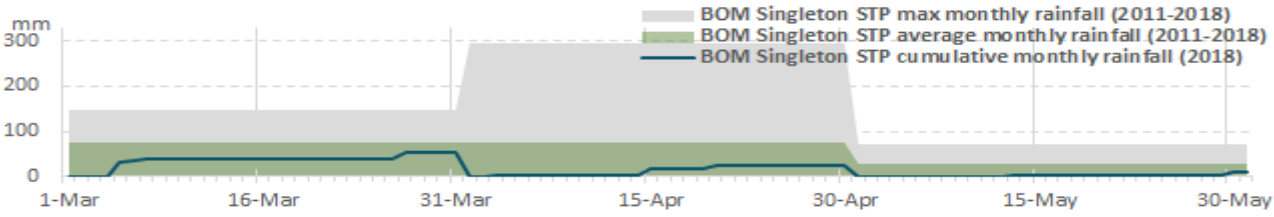

Figure 14 **Bureau of Meteorology Singleton STP[6] cumulative monthly rainfall during autumn 2018 plotted against the maximum and average monthly rainfall from autumn 2011 to 2018**

Figure 15 and Figure 16 show daily average levels of $PM_{2.5}$ during autumn 2018, compared to the daily maximum and minimum levels (shaded range) for autumn periods from 2011 to 2017, at Singleton and Muswellbrook. Daily $PM_{2.5}$ levels in autumn 2018 were generally within the same range as earlier years.

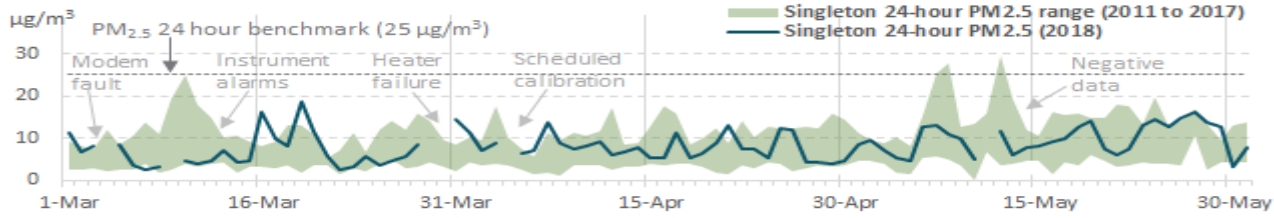

Figure 15 **Singleton daily average $PM_{2.5}$ during autumn 2018 plotted against the daily maximum and minimum $PM_{2.5}$ levels recorded from autumns 2011 to 2017**

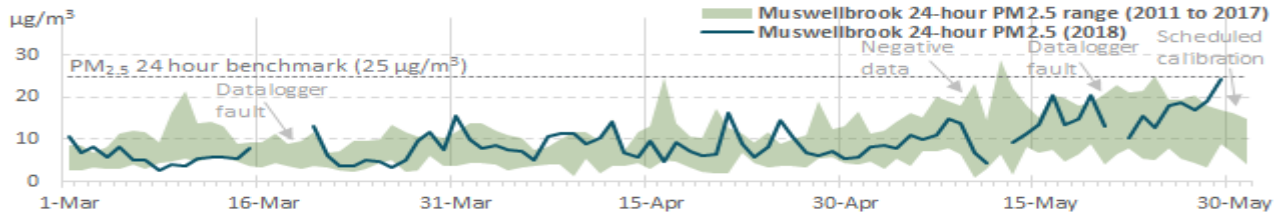

Figure 16 **Muswellbrook daily average $PM_{2.5}$ during autumn 2018 plotted against the daily maximum and minimum $PM_{2.5}$ levels recorded from autumns 2011 to 2017**

[6] Data obtained from the Bureau of Meteorology Singleton STP monthly rainfall data web page (accessed July 2018)

Meteorological summary

Rainfall and temperature[7]

The Upper Hunter had below average rainfall during autumn 2018. There was 50 to 200 millimetres less rainfall in autumn 2018 compared to 2017 and 100 to 400 millimetres less than autumn 2015. Rainfall was similar to autumn 2016 in the north part of the region, while up to 50 millimetres more in the south.

Maximum temperatures were very much above average during the season, while minimum temperatures were above average.

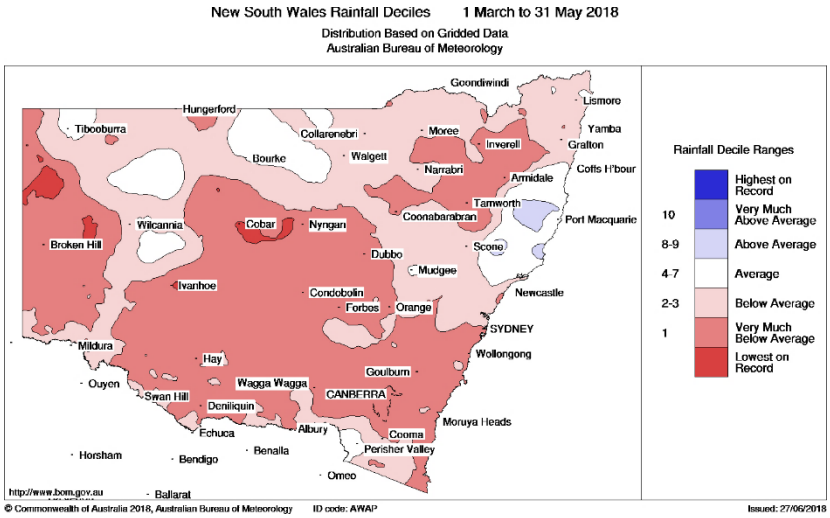

Figure 17 NSW rainfall deciles – autumn 2018

Wind

The winds were variable in the region during autumn 2018, which is typical for this time of year. Winds typically change from south-easterly during the warmer months to north-westerly as conditions cool. Wind speeds in autumn 2018 were similar to 2015 and 2016, while generally higher than other autumns.

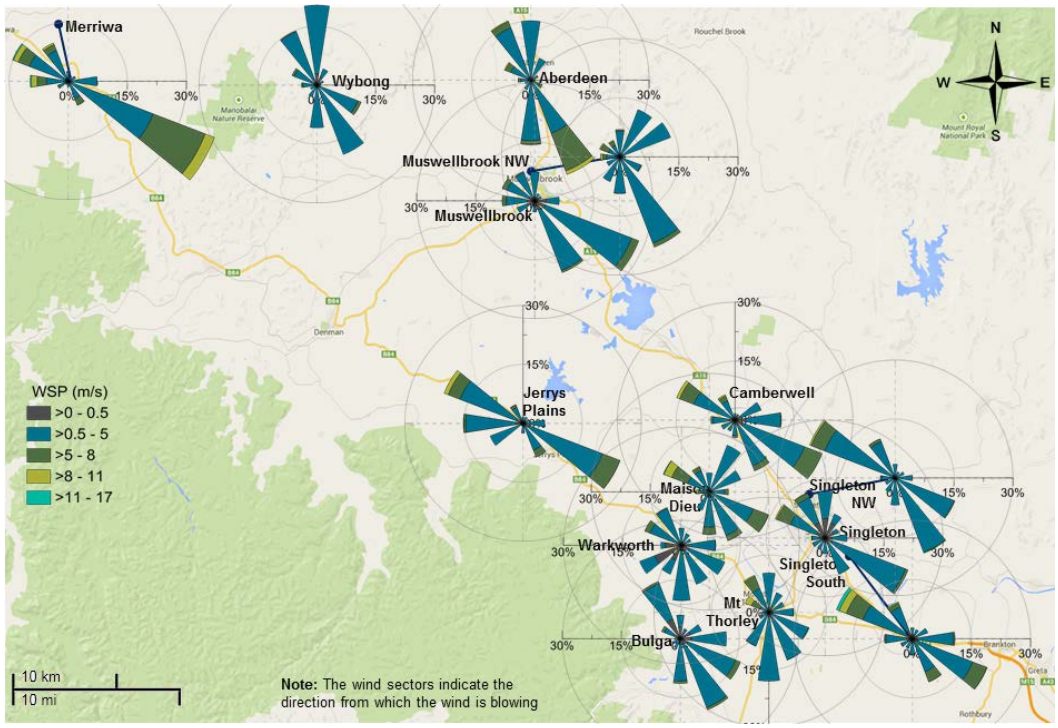

Figure 18 Wind rose map[8] for the Upper Hunter region for autumn 2018

[7] Rainfall and temperature information is from the Bureau of Meteorology New South Wales autumn 2018 climate statement and climate maps (accessed July 2018)

[8] Wind roses show the wind direction and speed at a location. The length of each bar around the circle in these wind roses show the percentage of time that the wind blows from a particular direction. The colours along the bars indicate the wind speed categories.

Particle event: 15 April 2018

Air pollution levels can be affected by extreme events, such as dust storms, bushfires and hazard reduction burns.

Air quality across NSW on 15 April 2018

An extensive particle event occurred on 15 April 2018. On this day all the Upper Hunter, Lower Hunter and Newcastle Local network sites recorded PM_{10} levels over the benchmark, in addition to Tamworth, Gunnedah and Narrabri (North-west Slopes) (Figure 19). These elevated levels followed the passage of a frontal system through NSW (Figure 20).

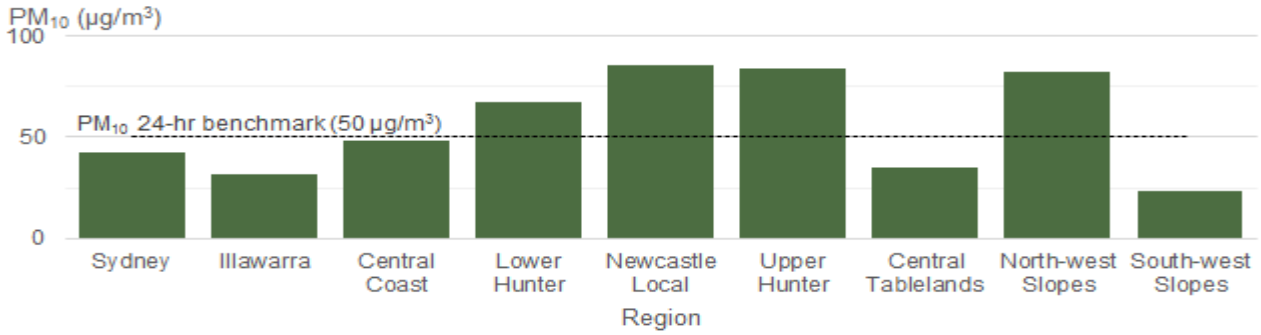

Figure 19 Maximum daily regional PM_{10} levels on 15 April 2018, by region

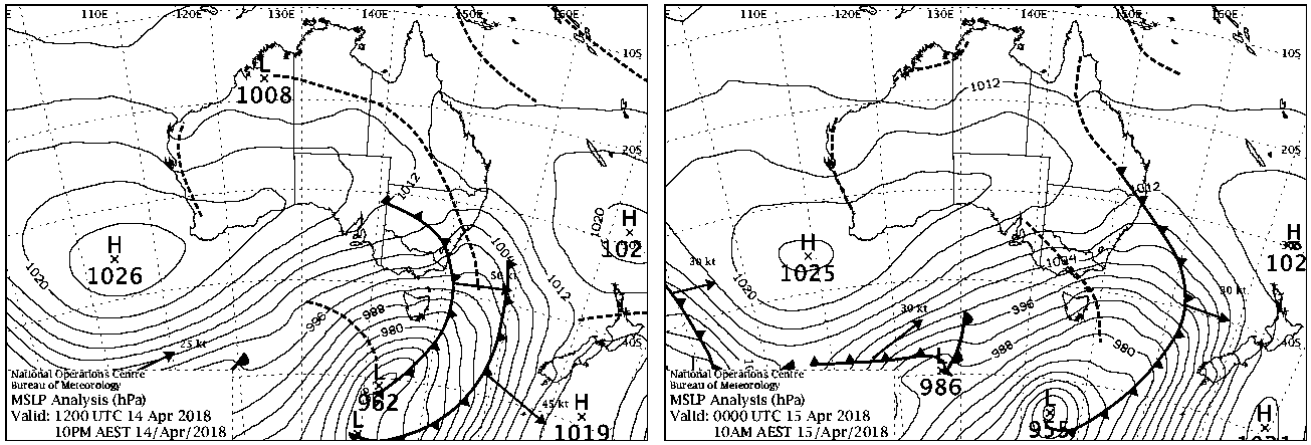

Figure 20 Synoptic charts[9] showing the passage of a front on 14 and 15 April 2018

Air quality in the Upper Hunter on 15 April 2018

In the Upper Hunter, particle levels exceeded the PM_{10} daily benchmark of 50 µg/m^3 on this day at all monitoring sites (Figure 21). Daily PM_{10} levels ranged from 57.2 to 84.0 µg/m^3 on this day.

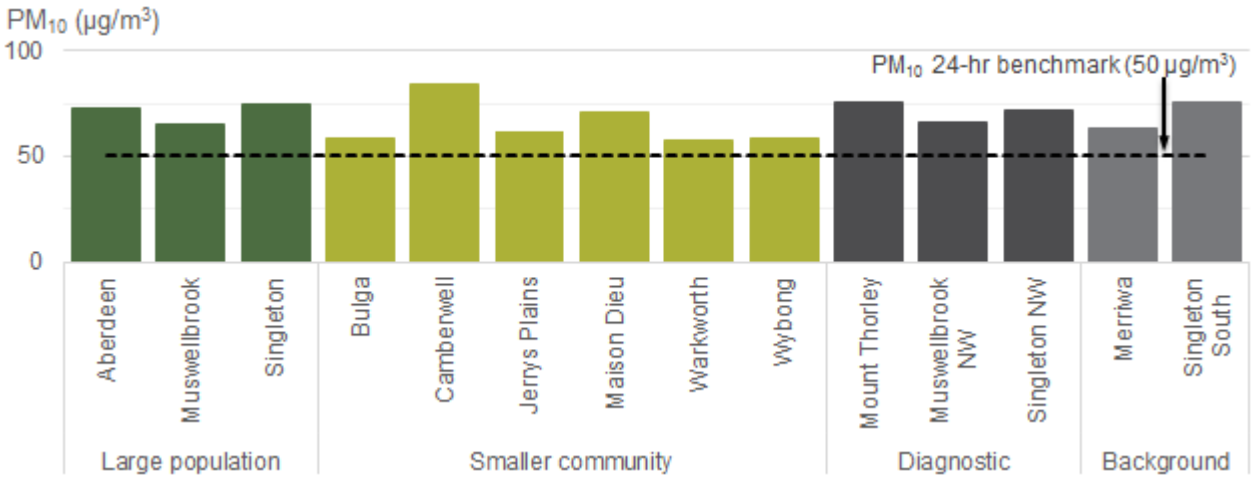

Figure 21 Daily PM_{10} levels in the Upper Hunter, by station type, 15 April 2018

[9] Sourced from the Bureau of Meteorology Analysis Chart Archive website (accessed in July 2018)

Pollution roses in Figure 22, show elevated hourly PM_{10} levels associated with winds from the north west at all sites in the Upper Hunter on 15 April 2018.

Merriwa is a background monitoring site, measuring the quality of air entering or leaving the Upper Hunter Valley during prevailing winds. The elevated daily PM_{10} level at Merriwa under north west winds suggests evidence of particle sources outside of the valley on this day.

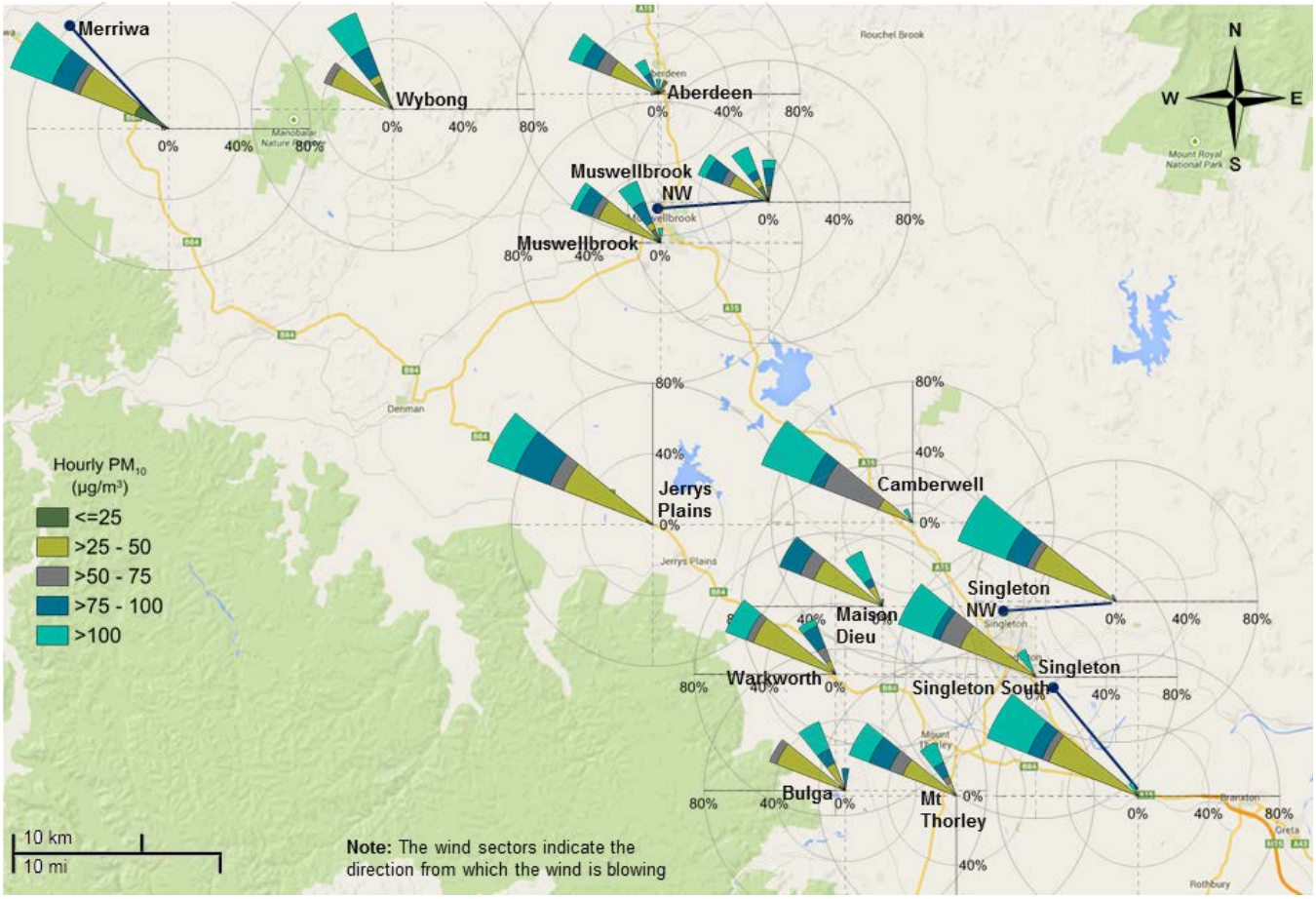

Figure 22 Hourly PM_{10} pollution rose map for the Upper Hunter region for 15 April 2018

Seasonal weather conditions

Dust activity in New South Wales was high during autumn[10] with the majority of the State recording below to very much below average rainfall (Figure 17) and much of the State experiencing drought conditions (Figure 2). The Upper Hunter was drier than two of the previous three autumn periods, as noted above.

DustWatch reported in May 2018[10] that widespread dust storms are very unusual in winter but are a possibility this year considering the low groundcover and ongoing dry conditions.

HYSPLIT in NSW back-trajectory modelling

The Office of Environment and Heritage (OEH) undertook back-trajectory modelling using HYSPLIT in NSW to determine the source of the elevated particles on 15 April 2018.

Figure 23 shows the modelled trajectory, or passage of air parcels, in the 24 hours before arriving at a location. The trajectories are shown for air parcels modelled at various heights, in metres above ground level (m AGL) arriving at Muswellbrook, Singleton and Newcastle.

Figure 23 shows air travelling to the Upper Hunter from the west and north west on 14 and 15 April 2018. These areas (Central West and Western NSW) are experiencing persistent dry conditions and are currently in drought (Figure 2).

[10] DustWatch report March 2018, DustWatch report April 2018 and DustWatch report May 2018

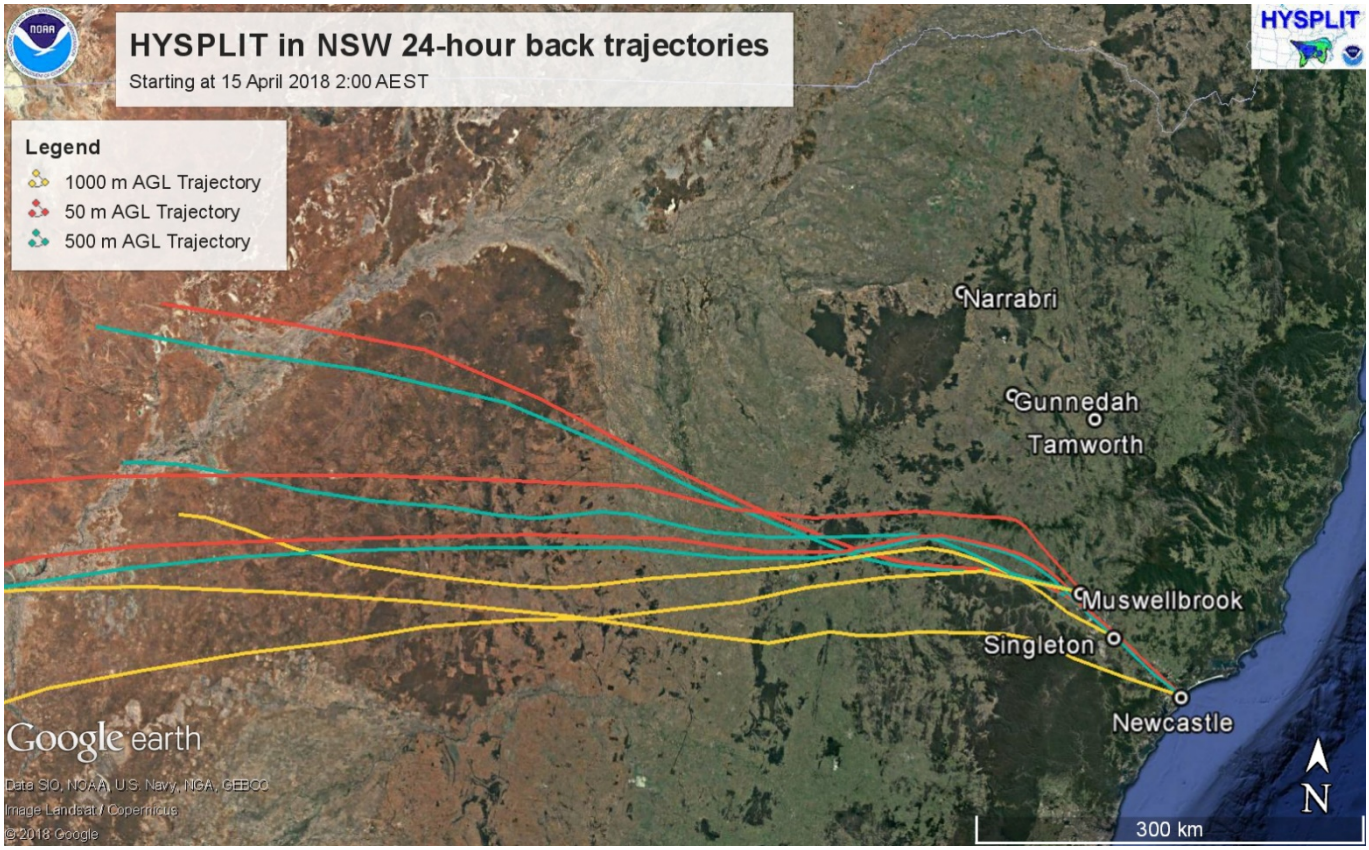

Figure 23 OEH HYSPLIT in NSW modelling output, shows the passage of air on 14 and 15 April 2018

Conclusion

The event analysis shows that Upper Hunter air quality was affected by the long-range transport of dust particles on 15 April 2018 coming from the drought affected Central West and Western NSW regions. This, combined with local particle sources, resulted in PM_{10} exceedances across the Hunter and northern air quality monitoring stations on this day.

Network performance

The target network performance is at least 95% available data for all parameters. The maximum online time that can be attained for NO_2 and SO_2 is 96%, due to daily calibrations.

Table 2 Online performance (%) during autumn 2018

Station	Particles PM_{10} daily	Particles $PM_{2.5}$ daily	Gases SO_2 hourly	Gases NO_2 hourly	Meteorology Wind hourly
Aberdeen	98	-	-	-	100
Bulga	99	-	-	-	99
Camberwell	98	96	-	-	99
Jerrys Plains	98	-	-	-	87
Maison Dieu	100	-	-	-	98
Merriwa	98	-	-	-	99
Mount Thorley	99	-	-	-	99
Muswellbrook	92	91	92	92	96
Muswellbrook NW	100	-	-	-	99
Singleton	99	93	94	94	100
Singleton NW	100	-	-	-	100
Singleton South	97	-	-	-	98
Warkworth	99	-	-	-	100
Wybong	100	-	-	-	100

- = not monitored

The overall reduced online times were mainly due to:

- Muswellbrook PM_{10}/$PM_{2.5}$ – datalogger faults (five days), scheduled calibration (two days) and negative $PM_{2.5}$ data (one day)
- Singleton $PM_{2.5}$ – modem fault (one day), instrument alarms (one day), heater fault (two days), scheduled calibration (one day) and negative data (one day)
- Jerrys Plains wind – sensor fault following earth lead damage by birds (12 days)

Definitions: Upper Hunter monitoring station types

The 14 monitoring stations in the Upper Hunter serve different purposes:

Larger population: stations near the larger population centres monitor the air quality in these centres.

Smaller communities: stations near smaller communities monitor the air quality at those locations.

Diagnostic: provide data that can help to diagnose the likely sources and movement of particles across the region as a whole; they do not provide information about air quality at population centres.

Background: the stations near Merriwa and Singleton South are at both ends of the valley and provide background data, measuring the quality of air entering and leaving the Upper Hunter Valley under predominant winds (south-easterlies and north-westerlies).

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UHMD Joint Environment Working Group
26 September 2018

Agenda Item 16

UPPER HUNTER AIR QUALITY FACT SHEETS

Issue

There is currently increased community concern regarding air quality in the Upper Hunter, given the dry environmental conditions.

Background

The Joint Working Group for Emissions & Health has recently developed two air quality fact sheets that aim to provide the community with factual information on why managing air quality is important, and what the NSW Government and industry operations are doing to minimise dust and manage impacts.

The idea to produce Upper Hunter air quality resources stemmed from local council representatives receiving regular queries from the community on the air quality in the Upper Hunter, and not having a ready-to-go resource summarising the issue, and the various key initiatives that manage air quality.

Two air quality fact sheets have been finalised. One contains information regarding air quality in the Upper Hunter and outlines what particulate matter is and why it is important that it be managed effectively. Another contains information on the key actions that the NSW Government and mining operations in the Upper Hunter are undertaking to ensure that emissions are minimised wherever possible, and should air quality issues arise, that they are effectively managed.

The two fact sheets are attached for reference, and can be accessed on the Dialogue website via the 'Air Quality Resources' page: http://www.nswmining.com.au/dialogue/latest-projects/emissions-and-health/air-quality-resources

Recommendation

- **That JEWG members note the air quality fact sheet resources and consider their wider use in communicating air quality initiatives to Upper Hunter community members.**

FOR INFORMATION/DISCUSSION

Attachments: Upper Hunter Air Quality Fact Sheets

AIR QUALITY IN THE UPPER HUNTER

WHAT IS PARTICULATE MATTER AND WHY IS IT IMPORTANT?

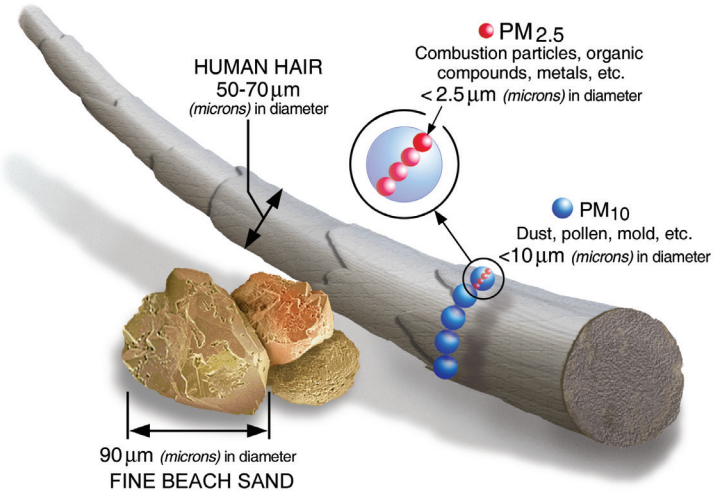
Introduction

Dust emissions from mining activities can be a serious issue if not closely monitored and effectively controlled. The NSW mining industry works very hard to meet the consistently high air quality standard that the NSW Government sets to preserve the health and safety of the communities in which mining operates

Various government and industry initiatives contribute to NSW having air quality that is considered good by world standards and is generally comparable with other Australian jurisdictions.

This fact sheet contains information regarding air quality in the Upper Hunter and outlines what particulate matter is and why it is important that it be managed effectively.

Figure 1: Comparison of particulate matter with other fine particles such as beach sand and human hair. (Source: United States Environmental Protection Agency, 2016)



Air quality and particulate matter

Air quality relates to the level of pollution that is in the air that we breathe. One component of air quality is the amount and size of particulate matter suspended in the air, known as PM. PM is the primary air pollutant associated with mining activities.

PM particles may be classified on the basis of their size as either:

- PM^{10}: Inhalable particles measuring less than 10 microns in diameter; or
- $PM^{2.5}$: Fine inhalable particles measuring less than 2.5 microns in diameter.

The following infographic demonstrates the size of PM^{10} and $PM^{2.5}$ particles compared to an average human hair, which can be up to 30 times larger than the largest fine $PM^{2.5}$ particle.

There are a number of emissions sources that generate fine particles. These include dust from mining operations, power stations, on-road vehicles, non-road diesel equipment, wood heaters, bushfires and hazard reduction burns, sea salt and biogenic sources, which may have varying impacts on air quality.

It is important that air quality is managed effectively as particle pollution can be harmful to human health. A 2015 report from the NSW Environment Protection Agency (EPA) and NSW Health found that fine particles ($PM^{2.5}$) are more detrimental to health and have a wider range of health effects than larger particles.

Meteorological conditions may also slow down the removal of pollutants, which can impact visibility or

reduce the amenity of landscapes.

Particulate matter in the Upper Hunter

Particulate matter is measured across the Upper Hunter through the Upper Hunter Air Quality Monitoring Network.

$PM^{2.5}$, or fine particles, are measured at Singleton, Camberwell and Muswellbrook. While Singleton and Camberwell have generally met the national air quality standard, Muswellbrook has exceeded the standard every year since monitoring began in 2011.

The Upper Hunter Valley Particle Characterisation Study conducted by CSIRO showed that dust from sources such as mining, and agriculture contributed an average of 11-12% of $PM^{2.5}$ particles at Muswellbrook, while wood smoke contributed 30% of $PM^{2.5.}$ Only five percent of dust generated from mine sites are $PM^{2.5}$ particles.

In the 2015 review of data, the Office of Environment and Heritage stated, "Annual average $PM^{2.5}$ levels were above the standard at Muswellbrook, where smoke from domestic wood heaters contributes significantly to particle levels". The EPA has prepared community advice regarding wood smoke pollution, available here **www.epa.nsw.gov.au/your-environment/air/reducing-wood-smoke-emissions**

PM^{10} or coarse particles, are measured at fourteen locations across the Upper Hunter. Most of dust generated at mine sites are PM^{10} particles and are associated with amenity impacts in the Upper Hunter such as visible dust in the air, or on items such as clothing or property.

While PM^{10} particles do not have as significant a health impact as $PM^{2.5}$ particles, the mining industry recognises that this is a priority area that needs to be focused on. Mining operations in the Upper Hunter are working collectively to reduce all PM emissions generated through mining activity and to manage any impacts should they arise.

The NSW Department of Health has more information regarding particulate matter and health in their Mine Dust and You page. To view this information, please visit: **www.health.nsw.gov.au/environment/factsheets/Pages/mine-dust.aspx**

For more information regarding industry actions to improve air quality and manage impacts,Please see the Dialogue's fact sheet 'Actions To Improve Air Quality and Manage Impacts' for more information on the various industry and government initiatives.

For more information about the Dialogue and how you can get involved,
visit: **www.miningdialogue.com.au**

AIR QUALITY IN THE UPPER HUNTER

ACTIONS TO IMPROVE AIR QUALITY AND MANAGE IMPACTS

Introduction

Dust emissions from mining activities can be a serious issue if not closely monitored and effectively controlled. The NSW mining industry works very hard to meet the consistently high air quality standard that the NSW Government sets to preserve the health and safety of the communities in which mining operates.

Various government and industry initiatives contribute to NSW having air quality that is considered good by world standards and is generally comparable with other Australian jurisdictions.

This fact sheet contains information on the key actions that the NSW Government and mining operations in the Upper Hunter are undertaking to ensure that emissions are minimised wherever possible, and should air quality issues arise, that they are effectively managed.

The Upper Hunter Air Quality Monitoring Network

The Upper Hunter Air Quality Monitoring Network is an industry funded and government managed real time ambient air quality monitoring network, operated independently by the Office of Environment and Heritage (OEH), and administered by the NSW Environment Protection Authority (EPA).

The Upper Hunter is the most densely monitored region in NSW relative to its size. The network includes fourteen air quality monitoring stations in strategic locations around Upper Hunter mining areas and populated centres, including Muswellbrook and Singleton, that provide publicly available, real-time information about air quality across the region, helping to inform air quality management strategies. Each mine operates an extensive network of monitoring stations in and around each operation that provides up to date data in real time.

OEH has produced a map of the Upper Hunter Air Quality Monitoring Network sites, which displays a rolling 24-hour average for PM^{10} and $PM^{2.5}$ results, while numbers for Nitrogen dioxide (NO^2), Sulfur dioxide (SO^2), wind speed and wind direction values are hourly averaged data. All readings are updated hourly. The Upper Hunter Air Quality Monitoring Network map can be viewed here: **http://www.environment.nsw.gov.au/aqms/uhunteraqmap.htm**

OEH publishes regular seasonal updates of the results of the Upper Hunter Air Quality Monitoring Network. Upper Hunter air quality has been classified as generally good over eleven successive reports from Autumn 2015 to Winter 2017. Detailed Air Quality Monitoring results and seasonal updates are available here: **http://www.environment.nsw.gov.au/topics/air/upper-hunter-air-quality-reports**

Upper Hunter Dust Risk Forecast Scheme

OEH and the EPA collaborated to develop a dust risk forecast scheme for the Upper Hunter to support actions by mines to reduce dust from operations in adverse weather conditions.

The scheme is designed to identify weather conditions that cause dust emissions from within the Upper Hunter Valley to be the dominant contributor to higher particle (PM^{10}) concentrations in major town centres such as in Singleton. A trial was undertaken with mining operations in the Upper Hunter in Spring 2017, and the results are being analysed to evaluate the skill of the forecast scheme.

Industry actions to reduce air quality impacts

Minimising dust is a part of daily work procedures at Upper Hunter mines and is the responsibility of all mine workers. Effective air quality management begins with the way a mine is designed, and continues into its operational management, right up to the end of its life through rehabilitation.

Mining operations in the Upper Hunter have adopted the consistent use of weather forecasting information to reduce or avoid air quality impacts. By planning ahead and making better informed decisions about managing air quality at their operations, sites can determine if adverse conditions are forecast, and implement appropriate measures to minimise the impact, including:

- Postponing blasting to avoid unfavourable wind conditions;
- Closing elevated exposed working areas, and operating only at lower levels;
- Limiting traffic to main haul roads;
- Wetting dry areas by using water carts;
- Reducing vehicle speeds to minimise wheel generated dust; and if necessary,
- Ceasing all operations until conditions improve.

Following the NSW EPA's introduction of legally binding Pollution Reduction Programs on coal mines throughout NSW in 2013, all coal mines are now controlling at least 80% or more of their dust emissions from dirt haul roads (a major source of potential dust emissions from mining operations).

Mining operations in the Upper Hunter are also improving their management of coal train dust along the rail corridor by avoiding overfilling and spillage of coal during loading, developing clean up procedures for coal deposited on the outside of wagons, and reviewing wagon door maintenance procedures.

Community engagement through the Upper Hunter Mining Dialogue

The Upper Hunter Mining Dialogue works with community stakeholders in the Upper Hunter to address the cumulative impacts of mining in the region, including air quality. Various members of the community, business, local government and industry are involved in the Dialogue and work together to address any issues that are raised within mining communities regarding air quality, through our Emissions and Health projects and working groups.

Key projects the Dialogue has implemented since its establishment in 2011 include:

- Development of a weather forecasting tool that enables operations to anticipate adverse weather conditions and take steps to prepare their operations to minimise dust;
- Working with the NSW Government to update the Mine Dust and You Fact Sheet and;
- Development of a community education video titled '**Clearing the Air**' demonstrating the actions taken on a mine site to minimise dust emissions.

For information regarding air quality in the Upper Hunter and why it is important that it be managed effectively, please see the Dialogue's fact sheet 'What Is Particulate Matter and Why Is It Important?' for more information on how particulate matter can impact air quality in the Upper Hunter.

For more information about the Dialogue and how you can get involved, visit: **www.miningdialogue.com.au**

UHMD Joint Environment Working Group
26 September 2018

Agenda Item 17

CURRENT DIALOGUE EMISSIONS AND HEALTH PROJECTS

Air Quality Communications

Members are encouraged to share the Dialogue's Clearing the Air short video. The YouTube link to the video can be found here: https://youtu.be/q4TojwxKVRQ.

The video has also now been embedded on the Dialogue website through recent updates. The video was also recently shown at an Upper Hunter Air Quality Monitoring Network Committee meeting by the EPA and resonated well with members as an informative video.

Weather Forecasting Project / Community Air Quality Forecast Alert

Please see **Agenda item 14** for more information.

Upper Hunter Air Quality Fact Sheets

Please see **Agenda Item 16** for more information.

Update of Mine Dust and You Fact Sheet

No update to provide.

OTHER AIR QUALITY MATTERS

NSW Government Air Quality Initiatives

The NSW Government is currently considering the next steps for several air quality initiatives, including:

- Clean Air for NSW
- Non-road diesel
- Load Based Licensing (LBL) Scheme Review
- Chief Scientist's review of coal train dust

The JEWG will be notified of any developments as these initiatives progress.

North West Air Quality Monitoring Network

Two new air quality monitoring stations were constructed in Gunnedah and Narrabri and began publicly reporting real-time data in December 2017. The network provides scientific, timely information to the community about air quality in the region. The addition of further monitoring stations to the network will be considered through the Namoi Regional Air Quality Advisory Committee. The daily site air quality index figures in these regions since the monitors were installed has been Very Good in Narrabri, and Good in Gunnedah (based on averages).

FOR INFORMATION / DISCUSSION

UHMD Joint Environment Working Group
26 September 2018

Agenda Item 18

PRESENTATION: CATE FISHER - MINE REHABILITATION BY INDUSTRIAL SYMBIOSIS

Issue

The Dialogue receives requests from external stakeholders seeking support for various projects that may be related to the Dialogue's key themes or projects. It is important that these be given due consideration by the relevant Joint Working Groups.

About the presenter

Cate Fisher presented at the 2018 Tom Farrell Institute Mine Rehabilitation Conference on proposed system of mine rehabilitation titled 'Mine rehabilitation by industrial symbiosis'. The system proposes an environmental, social and economic alternative to the current methods of mine rehabilitation by using mine voids scheduled for rehabilitation and plastic/glass waste to create growing terraces, which can be planted with perennial plants/small trees which will store carbon in the soil. Ms. Fisher is seeking to progress the proposal to a feasibility study.

Please see the attached document for a revised project application for Mine Rehabilitation by Industrial Symbiosis from Cate Fisher.

This proposal was initially discussed by the JASC, who requested additional information, and was further recommended for review by the JEWG. Feedback gathered from JEWG members will be provided to the JASC and ISC for final consideration, should the project be supported.

Recommendation

- **JEWG members consider the revised proposal and advise the Dialogue secretariat if further action beyond the distribution of the material is warranted.**

FOR DISCUSSION / DECISION

Attachment: Mine Rehabilitation by Industrial Symbiosis by Cate Fisher

UPPER HUNTER MINING DIALOGUE – Submission July 2018

PROJECT FOR CONSIDERATION:

Mine Rehabilitation by Industrial Symbiosis (MRIS)

1. BACKGROUND/KEY ISSUES:

1.1 DESCRIPTION OF THE PROJECT

MRIS is designed to convert an final void of a open cut mine into a carbon sink by using plastic waste and unwanted glass in 1000's tonnes per year, to create growing terraces, which can be planted with perennial plants/small trees that will store carbon in the soil.

1. 2 OUTLINE OF KEY ISSUE ADDRESSED BY THE PROJECT:

Mine Voids:- The standard operating procedure for mine relinquishment in Australia is to leave the final open cut void unfilled or in 'care and maintenance'. The mining company will make sure the void is made 'safe and stable' but there is no requirement for back filling the final void.

This current practice means a long-term negative impact from mining on three levels, environmentally, socially and economically;

Environmentally: - when the voids are not filled in they continue to be a source of air and water pollution, a liability to neighbors and potential subsidence risk.

Socially: - there is no further employment generated beyond a small number of maintenance staff.

Economically: - No further revenue is received but the liability remains.

MRIS if successfully implemented would minimise the environmental impact from an open void whilst generating a long-term employment for the community and enhanced asset values for the mine owner.

Waste:- To summarise, in Australia we create 2.2 tonnes of waste per person per year* at a cost in excess of $3b/year. 'Waste' is made of putrescible, green, building, hazardous and recyclable waste. Specifically looking at plastic and glass. Plastic has a low recovery rate of 14%* and glass of 56%* but this is expected to fall dramatically as China has banned waste importation on 1.1.18. Stockpiling/dumping in landfill of plastic and glass is becoming standard practice.

This presents an opportunity to use industrial symbiosis to support solutions to the intractable problems for the mining and waste industries.

*Australian National Waste Report 2016, Prepared by Blue Environment for Department of Environment and Energy.

2. GOALS, OBJECTIVES AND OUTCOMES SOUGHT FOR THE PROJECT, INCLUDING BENEFITS TO UPPER HUNTER COMMUNITY OF PROJECT.

Goal: For this submission to the Upper Hunter Mine Dialogue, the goal is to have community and mining company support for the MRIS.

Objectives: MRIS is designed to be economically, socially, and environmentally viable alternative to the current method of long term 'care and maintenance' for exhausted open cut mines. By replacement of the unused mine with a recycling and agricultural business.

Outcomes: The system of MRIS would be ecologically sound & economically viable alternative to the current method of long-term care + maintenance for final voids, therefore the long-term outcome is the replacement of unused mine with a recycling and agricultural business.

Benefits: MRIS will control for acid mine drainage whilst sequestering carbon, benefiting the community, owners, government and stakeholders.

3. *RESOURCES REQUIRED FROM THE DIALOGUE TO FACILITATE THE PROJECT'S SUCCESS.*

Resources required

- Support from the Dialogue Group in the form of regular constructive conversations.

Attached is the brochure for Mine Rehabilitation by Industrial Symbiosis

Please Note: This project will need a feasibility study to proceed.
This is beyond the scope of this submission.

Mine Rehabilitation by Industrial Symbiosis

By Cate Fisher

Introduction

The proposed system of mine rehabilitation by industrial symbiosis could be an environmental, socially and economically alternative to the current method of 'care and maintenance' or letting run off fill the void with AMD.

Mine rehabilitation by industrial symbiosis is designed to control for AMD whilst sequestering carbon, benefiting the owners and community.

Mine rehabilitation by industrial symbiosis is designed to enhance asset value for current and future owners.

In short, it could turn a dangerous hole in the ground into a carbon sink!

Conditions required

1. **Open Pit Mine*, scheduled for rehabilitation with facilities intact.**

   Such as:- Gravel, Stone, Gold, Gypsum, Coal, etc.,

2. **Close to a major city**.

   All large metropolitan cities have multiple recycling and waste facilities, on their outskirts.
   Access by road and rail to city < 3 hours.

***Geologically stable landform.**

3. Professional workforce & equipment accessible.

REPLAS **=** Australia's leading plastic recycler, with over 200 recycled plastic products available.

4. Funding available for initial conversion.

"*Waste glut looms for NSW as China closes the door*" (P. Begley, SMH, 29.12.17)

For the system to be viable in the long term, the method must be mutually beneficial to all stakeholders.

5. Unmet demand for both inputs and outputs.

Inputs: Australians produce 2+ tonnes of waste/per person /per year**. As 4 million people live in Sydney this will produce on average, 8 million tonnes annually, (ABS, Waste generation and disposal report, 2015.)

China has announced that it is moving in 2018 to '*Ban foreign waste'*. (Reuters, Sept, 2017)

"Recycling companies stockpiling thousands of tonnes of glass as cheap imports leave market in crisis"(Four Corners, Sept 2017)

"*Waste glut looms for NSW as China closes the door*"(P. Begley, SMH, 29.12.17)

"*In a world swamped by plastic waste there's a tonne for every single one of us*" (SMH/The Washington Post, 21.7.17)

Globally plastic is; 9% recycled, 12% incinerated, and 79% to landfill." Geyer R, Jambeck, Law, 2017, *"Production, use and fate all plastics ever made"*, Science Advances. 2017; **3**:e1700782

5. Unmet demand for both inputs and outputs.

Outputs: Agricultural Produce + Carbon Sequestration.

"Land restoration is essential to mitigate climate change via carbon sequestration" (*Roots of prosperity*, World Resources Institute, March 2017)

"Emissions must peak by 2020…Agriculture has a critical role to play, both in dramatically reducing emissions and by providing a sink to draw down carbon from the atmosphere" Christiana Figueres, Former Executive Secretary, United Nations Framework Convention on Climate Change (UNFCCC)

The Construction Process

The system of mine rehabilitation by industrial symbiosis is designed to convert an open pit mine into a carbon sink by using plastic waste and unwanted glass in 1000's tonnes per year, to create growing terraces which can planted with perennial plants/small trees which will store carbon in the soil.

Terraces

High-wall/batters are prepared and ground is levelled. Facilities are still available e.g., fencing, power, vehicular access.

Plastic* gabions (baskets) are moulded in two pieces, base crate and lid from reformed waste plastic and delivered on site. The gabions are permeable.

Each gabion is modular and fits together like 'lego'

Gabions will be filled with unwanted glass*/fashion waste*.

Terraced from the ground up the high wall/batters. Reinforced and secured into surrounding walls/batters.

Placement is by local skilled workforce augmented by crane. Gabions will 'click' together to maximise stability and tensioned by cables every other row.

Finished by a growing terrace i.e., (the plant level) initially by layers of *waste paper, *green waste, *organic material, *green waste, *organic material, so on and topped off with *mulched green waste. (No dig method for garden bed creation)

Mixed perennial grasses are planted in the first season, to commence the carbon sequestration. Then overplanted with cash crops for sale e.g. Spinach, Warrigal Greens, Bamboo shoots, blueberries, raspberries, goji berries, etc.

Access to the Growing Terrace will be by stairs with rail and harness points built into the centre of the gabions.

Water

Passive water remediation techniques will be used, e.g., constructed wetlands planted with macrophytes. The type, timing and volume required for a comprehensive water treatment depends on chemical analysis of water collecting within the mine area.

Water will need to be treated to the level of agricultural use.

Water will be supplied to each terrace for future watering of plants on growing terrace.

The constructed wetland will run across the bottom of the mine with as much gradient/curves as needed to convert AMD to useable water.

Water pumping will be solar powered.

* Current waste products produced in abundance by neighbouring city.

UHMD Joint Environment Working Group
26 September 2018

Agenda Item 19

NEXT MEETING / MEETING CLOSE

The next Joint Working Group meeting date is yet to be scheduled. Invitations will be sent out shortly once 2019 meeting dates have been determined.

We encourage member feedback on their preferred meeting times/dates and will seek to accommodate these in our 2019 planning.