

Singleton Shire Healthy Environment Group

“NSW Resident’s Health Protection Planning”



A community-based group looking to address Environmental issues affecting Singleton Shire residents

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

We seek identification as to what is making our Children and Community Sick so they can be mitigated by OH&S Compliance Orders.

SSHEG Focus on Health

SSHEG is Not Anti Mining or Anti Power Stations

11 November 2019

Productivity Commissioner
NSW Planning Review

ProductivityFeedback@treasury.nsw.gov.au

“Planning Assessment Expertise, Protocols & Procedures”

This SSHEG Submission is in response to The Hon Rob Stokes, Minister for Planning and Public Spaces; has requested the Productivity Commissioner to conduct a review of the Independent Planning Commission and report back to the Minister by mid-December 2019.

For 10 Years SSHEG on behalf of the Singleton Shire Community and Local Doctors GP’s, Resident’s Health has been sacrificed and sidelined by the Mining Industry in the Hunter Valley. Our member’s dialogue with Department of Planning over 20 Years, and more recently with PAC and IPC submission has met with Health stonewall resistance since the World Health Organisation 17 October 2013 declaration “*IARC: Outdoor air pollution a leading environmental cause of cancer deaths*”.

Our efforts are as follows: - “*Ten years of SSHEG Hunter Valley Air Pollution Research and Dialogue; three years with NSW Health; five years examination with the Upper Hunter Mining Dialogue has been unable to move Institutional Air Pollution practices. By Oct 2013 the World Health Organisation however emphatically declared the Disease associations and life shortening impact of all levels of Airborne Pollution*”.

This brings us to the recent example of the Rix’s Creek Continuation SSD6300 Project of 2015 to Oct 2019 and used here to illustrate the shortcomings and improvements for current Planning, Assessment, Approval, Decision Making, Conditions of Consent, the Day to Day Implementation Plans and Compliance & Complaint Processes, etc.

Issues are: -

1) SSHEG and NSW Health are seeking the Health Cultural change in Mining and Planning processes to Minimise Air Pollution in the Mining Industry in the Hunter Valley.

Include Assessment Priority Significance Audit of Government Decision Making Processes in the light of the World Health Organisation call for Health Authorities to play a leading role in Minimising Air Particulate Matter.

*Refer **Attachment 3** SSHEG Air Quality & Community Health 10 Year Review 2008 – 2018, August 2018; **Attachment 4** SSHEG “Impact on Health of Air Quality in Australia”. Senate Committee March 2013.*

2) Rixs Creek Continuation SSD6300 May 2015 – October 2019.

All Major Projects to be allowed only a fixed period of one year for the application in which time the project is either approved with conditions or Not approved or Terminated.

3) IPC & Planning - Decision Making Professionalism

Incorporate weighted judgement guidelines for Open Cut Mine Assessment Evaluation Criteria and Issue Decision Making Weighted Significance decisions not too dissimilar to Government Tendering evaluation Tables and selection of a complex nature.

4) Mine Productivity under threat - Pollution Dispersion

Planning, IPC & EPA to consider Mine Pollution Dispersion and Drifting Patterns Mitigation Controls as they impact “Near Neighbours Health” in conjunction with restrictions on and from Backburning, Pollen Spore events, Wood Fire Heaters and Bush

Burning events in the context of their Social Licence to Operate; and like other industries they are under threat of Full or Progressive Shutdown as Air Quality Hospitalisation levels Spike.

NSW Health summary for Air Quality was detailed on 3 Dec 2015:

“There is no evidence of a threshold below which exposure to particulate matter (PM) is not associated with health effects. Therefore, it is important that all reasonable and feasible measures are taken to minimise human exposure to PM, even where assessment criteria are met”.

5) IPC- NSW Health Concerns of 3 December 2015 – 15 Aug 2018.

*Health having been identified as the highest Singleton Resident’s Complaints Priority, repeatedly stated by NSW Health in both Planning, PAC and IPC evaluations; the IPC Evaluation, Assessment and Decision-Making Processes of 15 August 2018 appear naive for such a professional organisation. Refer the technical complexity in **Attachment 1 & 2** - SSHEG “Mine Pollution Dispersion & Minimisation” dated 11 November 2019, including SSHEG Upper Mining Dialogue Project Proposal entitled “Coordinated Coal Mining Air Pollution Mitigation Controls, Options as WHO & NEPM Standards lower in the Hunter”.*

6) IPC & Planning - Independent Health Expertise

Calls for Planning & IPC to be equipped to be truly independent with Specialist Health and Coal Industry Pollution Disease Expertise to keep pace with changing more stringent NEPM & WHO Standards as better targeted Medical Research since WHO 2013 Declarations on Air Pollution and Human Diseases unfolds.

*Refer **Attachment 5** “SSHEG Response to IPC Rixs Creek Report Aug 2018”*

7) IPC & Planning Independent Real Time Visualisation

*Expose Mine Operators to Resident's Day to Day Pollution associated Disease Impacts by Bringing to bear modern Emerging Real Time Visualisation Technologies as a Mine Process Pollution Mitigation Control Methodology for Mine Pollution Dispersion and Minimisation. Refer **Attachment 2** for Proposal outline.*

8) IPC & Planning - Procedural Legal Fairness

Audits for procedural fairness and visible transparency that Submissions are afforded due consideration before Approvals. The IPC approval Rixs Creek of 4 Oct 2019 and the submission extension to 11 Oct 2019 followed by Approval the next day 12 Oct 2019 leaves this decision open to challenge. These are additional grounds to the repeat of MTW 2002 etc attempts by intervening Modifications to hoodwink here that Rixs Creek Appeals provisions were extinguished by IPC Approval process. Clearly if Approvals are limited to one year, Mine applications need to be in order or otherwise reworked as a new application overcoming these uncertainties: clearly a productivity consideration. Further the MTW Land & Environment Court Rulings, and Supreme Court actions mean Preston's rulings are as valid today across the entire industry. Again, Preston's rulings on Rocky Hill Mine also apply. For certainty The Planning Approvals Process needs to be streamlined and their duration limited for the benefit of all parties.

9) IPC & Planning - Conditions of Consent as a Legal Entity

Transferring Approval decision Making into enacted Conditions of Consent lack legal connectivity in their implementation. Specific Wording is omitted but inferred while reliance on further Wording and Content Change is left in the hands of Mining Company Management Plans wording: Mostly without ongoing Compliance Auditing of the key Approval Decision Making Concerns.

Thanking you in anticipation of your acknowledgement.

Dr Neville Hodkinson PhD

Singleton Shire Healthy Environment Group
SSHEG is Not Anti Mining or Anti Power Stations

- Attachment 1 *SSHEG “Mine Pollution Dispersion & Minimisation” dated 11 November 2019. (9 Pages)*
- Attachment 2 *SSHEG Upper Mining Dialogue Project Proposal entitled “Coordinated Coal Mining Air Pollution Mitigation Controls, Options as WHO & NEPM Standards lower in the Hunter” dated Sept 2019. (22 Pages)*
- Attachment 3 *SSHEG Air Quality & Community Health 10 Year Review 2008 – 2018, August 2018. (5 Pages)*
- Attachment 4 *SSHEG “Impact on Health of Air Quality in Australia”. Senate Committee March 2013. (47 Pages)*
- Attachment 5 *SSHEG Response to IPC Rixs Creek Report Aug 2018” (17 Pages)*

Singleton Shire Healthy Environment Group

“Mine Pollution Dispersion & Minimisation”



A community-based group looking to address Environmental issues affecting Singleton Shire residents

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

We seek identification as to what is making our Children and Community Sick so they can be mitigated by OH&S Compliance Orders.

SSHEG Focus on Health

SSHEG is Not Anti Mining or Anti Power Stations

11 November 2019
NSW Minerals Council
Mining Dialogue Emissions & Health

“Mining Dialogue Workshop Exhibit – Pollution Dispersion”

“Ten years of SSHEG Hunter Valley Air Pollution Research and Dialogue; three years with NSW Health; five years examination with the Upper Hunter Mining Dialogue has been unable to move Institutional Air Pollution practices. By Oct 2013 the World Health Organisation however emphatically declared the Disease associations and life shortening impact of all levels of Airborne Pollution”.

NSW Health summary for Air Quality was detailed on 3 Dec 2015: -

“There is no evidence of a threshold below which exposure to particulate matter (PM) is not associated with health effects. Therefore, it is important that all reasonable and feasible measures are taken to minimise human exposure to PM, even where assessment criteria are met”.

SSHEG Community Healthy Living focuses upon Mine Pollution Disease Impacts on Residents - breath by breath; insisting that mines Mitigate Pollution by “Minimising to World Health Organisation ongoing identified Guidelines” over each 15 Minute period, of Cumulative Locality readings for PM10 & PM10-2.5 & PM2.5: **That is the Healthy Air we Breathe criteria!**

Since 2013 SSHEG has called for a Culture Change to “*Minimise Mine Air Pollution Emissions at their every source*”, and referencing 15 Minute PM10 and PM2.5 Real Time Monitoring at specific Resident Localities for “*Progressive Mine Operations Shutdown Pollution Mitigation*”.

NSW Health (**Fig 1**) in their reviews, comments and submissions on NSW Government Department of Planning, Industry & Environment Major Projects Mine Assessments in recent years have detailed their particular concerns relating to Air Quality and impacts on Residents, including having to continually restate their concerns in the hope they will be heeded.

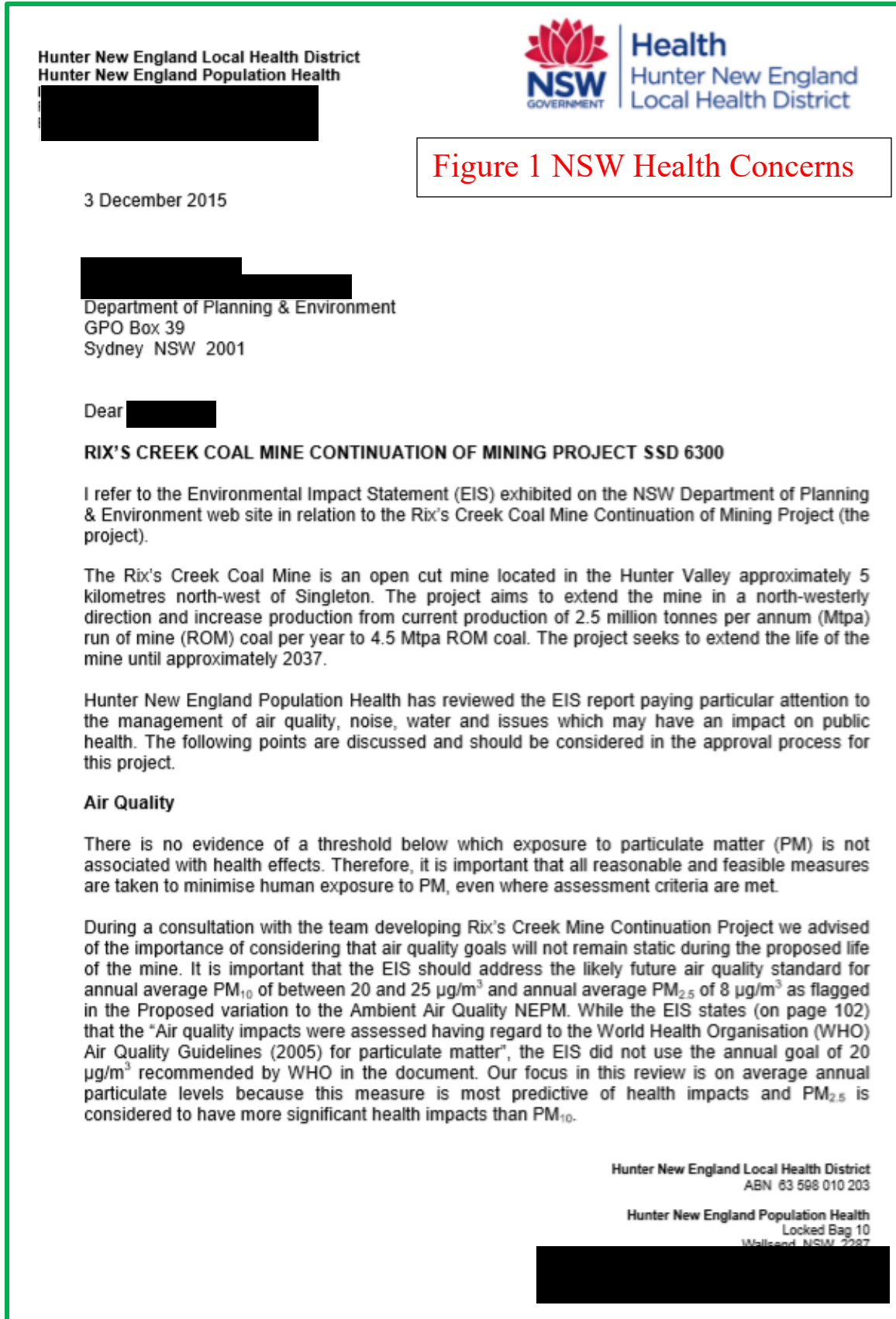
Finally, Hunter Valley Air Quality Mine Assessment Agreement was reached on 15 August 2019 between NSW Health, Independent Planning Commission and Department of Planning, Industry and Environment; agreement to IPC Recommendation R1- Air Pollution - Fig 2: -

“R1- That the...Mine... demonstrate how its operational procedures will incorporate continual improvement to further reduce the generation and dispersion of particulate matter”.

And with Meeting wording; - *“The summary of the response is that ...Mine .. has committed to continually revise and update its air quality, mitigation and management measures to reflect operational changes and advancements in technology, and to document these improvements to air quality and greenhouse gas management plan. The department... (DPIE).. is satisfied with this approach, and has recommended conditions to ensure that ...Mine... continues to implement best practice over the life of the mine and document these measures in that plan.”*

NSW Health agreement response: - *“As a general principle that they should be continually improving their approaches to air pollution, and particularly particulate matter – it’s a very good idea. And I think – yes. This process that’s proposed where they have to continually assess and describe how they’re achieving best practice makes – yes. I think that makes a lot of sense”.*

This is the IPC decision process in action, and the full extent of NSW Health discussions of what is the major Singleton Shire Community Mine Approval concern: And, SSHEG Questions; has this IPC R1 detailing of NSW Health concerns since 2015 translated into Mine Approval “Conditions of Consent” for Pollution Mitigation Controls?



2

The village of Camberwell is inside the contours for modelled worst case annual $PM_{2.5}$ and PM_{10} goals (using $30 \mu\text{g}/\text{m}^3$ as the goal) (Figures 11.7, 11.8, 11.9, 11.10). Figures 11.9 and 11.10 depicting modelled worst case annual average PM_{10} only provide a $30 \mu\text{g}/\text{m}^3$ contour. Displaying a $20 \mu\text{g}/\text{m}^3$ and $25 \mu\text{g}/\text{m}^3$ contour (as relevant to the goal promoted in the variation to the Australian NEPM) would be of great use in assessing the impact on the nearby settlements such as McDougalls Hill and Singleton Heights. While the Rix's Creek project may only contribute a small (but not insignificant) proportion of particulate emission to the local communities, it is the total impact that is important from a cumulative impact assessment perspective. The intensive mining in this area will likely exceed current and particularly future air quality goals making it difficult to argue that increased particulate emissions are acceptable from a cumulative impact perspective. There are multiple and significant impacts on receptors 170 – 177. The EIS appears to dismiss these impacts because the properties are eligible for acquisition, however, rights to acquisition do not diminish or negate the cumulative impact to these communities (page 111).

Noise and Blasting

Environmental noise can have negative impacts on human health and well-being and trigger ongoing community complaints about annoyance, sleep disturbance and stress. Evidence concerning the adverse health effects of environmental noise is detailed in a number of publications, for example, the *World Health Organization Night Noise Guidelines for Europe* (2009) and the *WHO Guidelines for Community Noise* (1999). To protect public health, it is prudent to take all reasonable and feasible measures to minimise public exposure to mine-related noise, irrespective of compliance with the relevant noise policies.

Data presented in Table 19-6 Impacts on Social Amenity indicate that 37% of all complaints between 2001 and 2015 relate to noise impacts, mostly from operational noise from the Mine, but also noise from coal trains passing residential areas. A further 29% of complaints related to overpressure levels and vibration from blasting (shaking of houses, windows or sheds). These complaints arose even though the airblast and ground vibration from current blasting operations complies with the regulatory limits at all sensitive sites.

Under the *NSW Industrial Noise Policy* (EPA 2000), a development is considered to cause a noise impact if the predicted noise level at the receiver exceeds the project specific noise levels (PSNL) for the project. This Policy also details the response and mitigation measures required when noise trigger levels are met or exceeded

The noise modelling in the EIS shows the potential for some significant exceedences of PSNL in all Noise Assessment Groups (NAG) during worst case scenarios. It has been explained in the EIS that, in accordance with the above policy, as this is an existing development with noise legacy issues, where the modification would have beneficial or negligible noise impacts, that the consent authority cannot grant voluntary mitigation and acquisition rights. The EIS also explained the noise mitigation measures being implemented to address these legacy noise issues. However, it would be preferable for the affected sensitive receivers if these measures were implemented sooner and that very strict controls were placed on operations during conditions that would lead to the noise levels predicted in Table 4.7: 90th Percentile Operational Predictions – $L_{Aeq, 15 \text{ minute}}$ dB.

Effective community consultation is required throughout the project to facilitate public involvement and to allow for the community to participate in the mitigation selection process.

In February the NSW Environment Protection Authority (EPA) announced the introduction of new conditions for open cut coal mines in NSW prohibiting the emission of blast fumes that are likely to cause offence to members of the public. The new licence condition states: “offensive blast fume must not be emitted from the premises”. We emphasise the need to ensure strict control of blast conditions to protect the public from blast fume emissions.

Surface Water

There is a health risk from direct human exposure to contaminated surface water or if contaminated surface water enters a drinking water supply. The main drinking water supply for

3

Singleton, Glennies Creek Dam, is significantly upstream of Rix's Creek Mine and will not be impacted by the Project.

The EIS mentions one other licensed water user on Rix's Creek, and one other on the Un-named Tributary, that could be impacted by the reduction in catchment flows caused by the Project. However, Rix's Creek is an ephemeral stream with a flow rate of zero for 44% of the time. Presumably these two other water users are not using this water as a drinking water supply.

The EIS states that, to date, there have been no observable impacts from Rix's Creek Mine operations on the water quality in Rix's Creek, and provided existing management systems are maintained and measures recommended in Section 15.5 are adopted, there is a low risk of impacts on water quality in the surrounding catchment due to ongoing mining operations.

It is important that any private water users downstream have easy access to and can understand monitoring data. It is also important that, in the event that the water becomes unsuitable for use by private water users that an alternative water source of the same standard, quantity and quality is offered.

Groundwater

The EIS states that the review of licensed bores indicates that all but one are located more than 4.5km from the centre of the Rix's Creek Mine lease area, and they are relatively shallow bores targeting alluvial aquifers which do not extend into the mined area and are considered hydraulically isolated from the Mine target coal seams. The closest bore is 2.38km east of the Mine and is deeper; however, the EIS states that the target of this bore is also hydraulically disconnected from the Mine target coal seams. The EIS therefore concluded that there are no identified groundwater users which could be potentially impacted by the Project.

Rainwater Tanks

The EIS does not mention issues associated with water quality from rainwater tanks at residences without a reticulated water supply. It is recommended that the applicant address the issue of potential impacts on rainwater quality that may be caused by dust from mining construction and operations.

The peak reference document in Australia for information in relation to rainwater tanks is enHealth's *Guidance on use of rainwater tanks* (2010). It would be appropriate to utilise this document and apply its recommendations and standards to rainwater tank systems within the vicinity of the development.

The above document states that "tanks should be inspected every 2-3 years for the presence of accumulated sediment. If the bottom of the tank is covered with sediment the tank should be cleaned". In addition, consideration should be given to the installation of first flush diverters to rainwater tanks to reduce the amount of sediment entering the tanks.

A management system of taking complaints and rectifying issues identified should be considered.

If you require any further information please feel free to contact [REDACTED]

Yours Sincerely

[REDACTED]

[REDACTED]
Hunter New England Population Health

40 PROF O’KANE: - - - I just wanted to check that Health is indeed comfortable with where things have landed in the assessment report, which I can share with you if you need it, and with the proposed conditions.

45 DR BROOME: Thanks. So Richard Broome. I’m Director of Environment Health Branch at New South Wales Health. Yes. So I think by way of background, the first letter dated 29 June 2018 highlighted issues related to some predictions that the level

IPC MEETING 15.8.19R1 P-2
©Auscript Australasia Pty Limited Transcript in Confidence

Figure 2 Extracts from IPC Meeting 15 August 2019 re NSW Health Concerns

of PM10 might be higher than 25 micrograms at some residences, and I think that concern continued following the 21 December letter, but the conditions that we have seen say that the proponent has got to achieve a level of below 25 micrograms at any private residence. So I think that ties off the concern.

5 PROF O’KANE: Right. Good. So that’s there. I’d then like to go, unless Tony - - -

MR T. PEARSON: No. That’s - - -

10 PROF O’KANE: Yes. I then wanted to go to the fact that when the commission did the review in the review phase of this project, we had mentioned a couple of recommendations relating to air quality, and I’m just turning them up, which is why the noise on the tape, and the two relevant ones were – the first one was the applicant demonstrate how its operational procedures will incorporate continual improvement to further reduce the generation and dispersion of particulate matter, and the answer really is that – well, I suppose it’s better to read it. The summary of the response is that Bloomfield has committed to continually revise and update its air quality, mitigation and management measures to reflect operational changes and advancements in technology, and to document these improvements to air quality and greenhouse gas management plan. The department is satisfied with this approach, and has recommended conditions to ensure that Bloomfield continues to implement best practice over the life of the mine and document these measures in that plan. Are you comfortable with what’s proposed there, or would you - - -

25 DR BROOME: I think so. May I have a - - -

PROF O’KANE: Of course. Yes.

30 DR BROOME: - - - slightly closer look?

PROF O’KANE: Look. Of course. So it’s there and just over the page. Yes.

35 DR BROOME: I think as a general principle that they should be continually improving their approaches to air pollution, and particularly particulate matter – it’s a very good idea. And I think – yes. This process that’s proposed where they have to continually assess and describe how they’re achieving best practice makes – yes. I think that makes a lot of sense.

40 PROF O’KANE: Good. Okay. Well, thank you. Then, the next one was – the next

Subsequent translation of this agreement into Conditions of Consent is now under scrutiny and for Mining Dialogue Discussion !

How have NSW Health issues been addressed???

Air Quality and Greenhouse Gas Management Plan

- B26. The Applicant must prepare an Air Quality and Greenhouse Gas Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:
- be prepared by a suitably qualified and experienced person/s;
 - be prepared in consultation with the EPA;
 - be submitted to the Planning Secretary for approval within six months of commencing development under this consent;
 - describe the measures to be implemented to ensure:
 - compliance with the air quality criteria and operating conditions of this consent;
 - best practice management is being employed (including in respect of minimisation of greenhouse gas emissions from the site and energy efficiency); and
 - the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;
 - describe the air quality management system in detail; and
 - include an air quality monitoring program, undertaken in accordance with the *Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007), that:
 - uses monitors to evaluate the performance of the development against the air quality criteria in this consent and to guide day to day planning of mining operations;
 - adequately supports the air quality management system; and
 - includes a protocol for identifying any air quality-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of these events.
- B27. The Applicant must implement the Air Quality and Greenhouse Gas Management Plan as approved by the Planning Secretary.

Air Quality Criteria

- B22. The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria listed in Table 3 at any residence on privately-owned land, excluding the air quality-affected land referred to in Table 7.

NSW Government
Department of Planning, Industry and Environment

14

Rix's Creek South Continuation of Mining Project
(SSD 6300)

Table 3: Air quality criteria

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM ₁₀)	Annual	^{a, c} 25 µg/m ³
	24 hour	^b 50 µg/m ³
Particulate matter < 2.5 µm (PM _{2.5})	Annual	^{a, c} 8 µg/m ³
	24 hour	^b 25 µg/m ³
Total suspended particulate (TSP) matter	Annual	^{a, c} 90 µg/m ³

Notes:

- Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).
- Incremental impact (i.e. incremental increase in concentrations due to the development on its own).
- Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.

- B23. The air quality criteria in Table 3 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

DPE RESPONSE TO RIX’S CREEK IPCN QUESTIONS

26 June 2018 Arising from IPC Briefing held 25 May 2018

Table 1: NSW Health Comments re: EIS

“It is important that the EIS should address the likely future air quality standard for annual average PM10 of between 20 and 25 $\mu\text{g}/\text{m}^3$ and annual average PM2.5 of 8 $\mu\text{g}/\text{m}^3$ ”

While the EIS states (on page 102) that the “Air quality impacts were assessed having regard to the World Health Organisation (WHO) Air Quality Guidelines (2005) for particulate matter”, the EIS did not use the annual goal of 20 $\mu\text{g}/\text{m}^3$ recommended by WHO in the document. Our focus in this review is on average annual particulate levels because this measure is most predictive of health impacts and PM2.5 is considered to have more significant health impacts than PM10.

Displaying a 20 $\mu\text{g}/\text{m}^3$ and 25 $\mu\text{g}/\text{m}^3$ contour (as relevant to the goal promoted in the variation to the Australian NEPM) would be of great use in assessing the impact on the nearby settlements such as McDougalls Hill and Singleton Heights.

The intensive mining in this area will likely exceed current and particularly future air quality goals making it difficult to argue that increase particulate emissions are acceptable from a cumulative impact perspective.

There are multiple and significant impacts on receptors 170 – 177. The EIS appears to dismiss these impacts because the properties are eligible for acquisition, however, rights to acquisition do not diminish or negate the cumulative impact to these communities (page 111)”.

Figure 3 NSW Health Concerns 3rd December 2015 as outlined by DPE 26 June 2018

Upper Hunter Mining Dialogue Application Form for Consideration of Dialogue Project Proposals

Projects brought to the attention of the Upper Hunter Mining Dialogue's (Dialogue) Joint Advisory Steering Committee (JASC) for consideration will need to provide a detailed description of the project's background, a clear outcome being sought, and the resources required to support the proposal. Please note that the Dialogue will not support any sponsorship proposals seeking monetary support. Any sponsorship proposals are to be directed to the NSW Minerals Council.

Background / Key Issue(s)

Provide a brief description of the project, outlining the key issue or problem to be addressed. Detail how the project relates to the Dialogue's primary objective to address cumulative impacts of mining.

Prepared by [REDACTED] Mar- Sept 2019

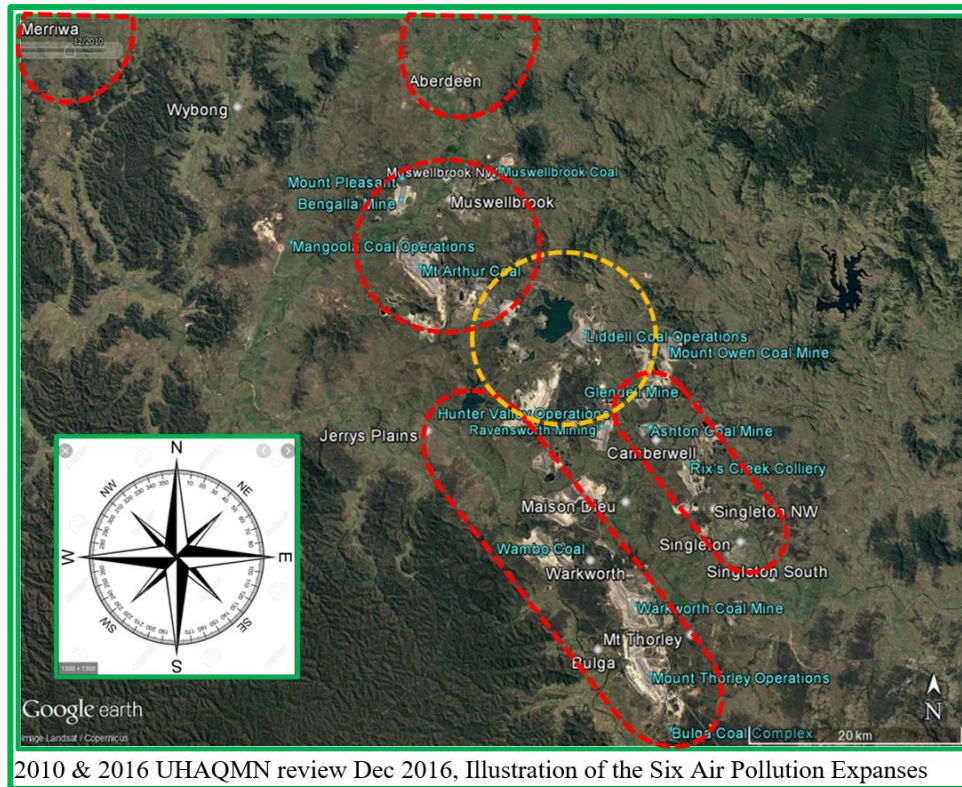
“Coordinated Coal Mining Air Pollution Mitigation Controls, Options as WHO & NEPM Standards lower in the Hunter”.

The focus of this Mining Dialogue^{//} Project is to develop alternate Mining Industry Air Pollution Emission Mitigation Options that can be introduced over and above existing 2019 Mine Operating Practices (Dust Stop, Weather forecasting, Blast size & Stemming, etc) to firstly (Stage 1 by 2020) lower the Air Quality Particulate Matter Exposure experienced especially by Singleton Shire Residents to achieve the Feb 2016 National NEPM(Ambient Air Quality) Standards requirements.

<https://youtu.be/q4TojwxKVRQ>

Secondly (Stage 2 by 2030), to progressively implement Mine Air Pollution Mitigation Protocols for yet further lowering below these 2016 NEPM Australian National Standards to minimum levels as guided by World Health Organisation initiatives since 2013; such as the provision for their further reductions foreshadowed under WHO PM Disease Review since 2016. This is especially so for the emerging Nanoparticle Disease Research of Combustion formed, and Diesel Particulate Exhaust Emissions from mining equipment now confirmed as present penetrating into Human Brains and Organ Tissues. Nano Diesel Particles currently would only be so far included as NEPM PM2.5 reducing goal in 2025. [NEPM - National Environment Protection (Ambient Air Quality) Measure Feb 2016]

This Mining Dialogue Project targets to identify over two Stages, a Suite of Mine Pollution evolving Mitigation Options, preferable targeting Pollution Emission Sources and their *Air Pollution Drifting Patterns and Cumulative Air Pollution Expanse influences* that daily expose Near Neighbour Residents: and thus provide the basis for Pollution Mitigation Strategies that can be progressively incorporated by Hunter Valley Mining Industry Companies over the next 25 Years to catch up with, and achieve the ever reducing and emerging Human Health Air Quality Standards as detailed by the United Nations, WHO and IARC since 2013 for Mortality, Morbidity, and Loss of Life Expectancy. (refer **Figure MD1** below)



Background

In 2008 the Singleton Shire Concerned Residents Disease observations of the Hunter Valley Mining and Power Station Air Pollution Cocktail Drifting Patterns provided the layman's view and the basis (SSHEG 2010 Dec doc) for NSW Chief Health Officer's Expert Advisory Group investigations into Local General Practitioner Doctors and Resident's Disease associations of the Mining Industry Airborne Pollution; especially "Near Neighbours to Industrial Emission Sources of Air Pollution".

Community observations of hours and days of accumulated "Valley Haze and Mine Dust Drifting Patterns" remains at odds with the Atmospheric Dispersion EIS 25 Year Models that estimate only the Downwind Air Pollution Contaminants, as a "form of concentration contours that merely reduce to reflecting Wind Rose information averaged over long Time Periods". As early as 1985, ANU were investigating as a prelude to Industrial Development, a Risk Assessment Scheme for Air Quality in the Hunter Valley of NSW; proceeding from the identification of the Particle Pollution Sources, their transport Pathways from the Sources to Residents Sites, their eventual Environmental Impact from the transported Pollution Dose Exposure of Residents as well as their atmospheric stability conditions limitations that remain in use today; although refined by PAE Holmes et al since, through to 2010.

Resident's Hour by Hour Mine Drifting Air Pollution Exposure Disease Impacts are being encountered daily by Singleton GP's soon after these hourly Mine Pollution Exposures Camberwell and Maison Dieu UHAQMN SMS messaging Alerts and exceedances are glaring examples of these unacceptable Disease Impacts!

The Diurnal Variability, the Time of Day Air Drifting Patterns, Seasonal Weather

Patterns, the changing Landscape of working Mine Voids, Overburden Mountains and their Orientation over 25year Mine cycles are critical elements to the Dispersion of Mining Industry Air Pollution containment changes. Mine Air Pollution should otherwise be contained within the Mine Lease boundaries and by any Buffer Zones provided.

The Hunter Valley Coal development focus emerged shortly after the establishment of the Electricity Commission of NSW formed in 1950; taking over and managing Electricity Generation across the State, connecting to Snowy Mountains Generation, Coal and Generation in Central Coast by 1960's, and Liddell Power Station developed in association with Kurri Kurri Aluminium Smelter by 1971. **Air Pollution Dispersion in the enclosed Hunter Valley then and now was fundamental to Community Health Protection.**

In 1980 the role of Electricity Commission was extended to manage the use of Coal for the generation of Electricity or sell for profit; reduce the cost of Electricity Generation and Supply, and to promote and encourage research into the development of Coal Resources in NSW. The era of cheaper Open Cut Coal Mining emerged in the Hunter Valley, with Bayswater Power Station and Tomago Aluminium Smelter by 1985. Still today Tomago uses 12% of NSW Electricity Capacity, while Newcastle Port Exports up to 100 million Tons of Hunter Coal pa mostly from Open Cut Coal Mining in the Hunter Valley.

The continuation of Open Cut Mining currently without Population Protection Buffer Zones interspersed within Farming Localities, Villages and Towns of the enclosed Hunter Valley in 2019 depends entirely on more accurate Mining Air Pollution Dispersion Methodologies Mitigation Controls that can cater for existing and envisaged Hour by Hour Air Drifting Mine Pollution Dose Exposure of Residents; incorporating the "Near Neighbours Downstream Individual Disease Status Propensity" that lowers allowable PM10, PM2.5 (Fine) and PM10-2.5 (Coarse) hourly Limits of Mine Air Pollution Mitigation Controls.

Outcomes / Benefits

Provide a brief description of the goals, objectives and outcomes being sought for the project, including how this will benefit the Dialogue and the Upper Hunter community. E.g. seeking Dialogue support for an existing project, or to pursue a project through the Working Groups.

Project Goals, Objectives & Outcomes

- ✓ Develop alternate Mining Industry Air Pollution at Source-Emission Mitigation Options for Stage 1 by 2020 that can be introduced over and above existing 2019 Mine Operating Practices (Dust Stop, Weather forecasting, Blast size & Stemming, etc) to firstly lower the Air Quality Particulate Matter Exposure experienced especially by any Near Neighbour Residents that at any time are likely, or predicted by UHAQMN Air Pollution Drifting Patterns from other Sources, to exceed the Feb 2016 National NEPM (Ambient Air Quality) Standards requirements of below 50ug/m³ PM₁₀ Daily Average and 25ug/m³ PM_{2.5} Daily Average.
- ✓ Develop an alternate Suite of Mining Industry Air Pollution Emission Mitigation Options for (Stage 2 by 2030) that can be introduced over and above Stage 1 2020 Mine Operating Practices, to progressively implement Mine Air Pollution Mitigation Protocols for yet further lowering below the 2016 NEPM Australian National Standards to minimum levels as targeted by World Health Organisation initiatives since 2013; preferable targeting the Pollution Emission Source and their Air Pollution Drifting and Dispersion Patterns that daily expose Near Neighbour Residents, and so as to achieve further reductions foreshadowed under WHO and IARC Particulate Matter Disease Review since 2016. This is especially so for the emerging Nanoparticle Disease Research of Combustion formed and Diesel Particulate Exhaust Emissions from mining equipment now confirmed as present throughout Human Brains and Organ Tissues.
- ✓ This Mining Dialogue Project Objective, focuses upon the implementation of effective Mine Pollution Mitigation Controls that are seen to recognise the Community Pollution Disease concerns as recently adjudged by the Centre for Air Pollution, Energy and Health Research summary status and references in June 2018 as illustrated above:-
A Comparison of the Health Effects of Ambient Particulate Matter Air Pollution from Five Emission Sources
 - ✓ [Neil J. Hime](#),^{1,2,*} [Guy B. Marks](#),^{1,3,4} and [Christine T. Cowie](#)^{1,3,4}
 - ✓ [Int J Environ Res Public Health](#). 2018 Jun; 15(6): 1206.

Objectives Stage 1 by 2020

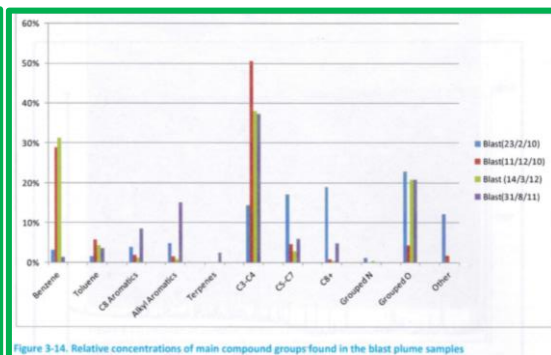
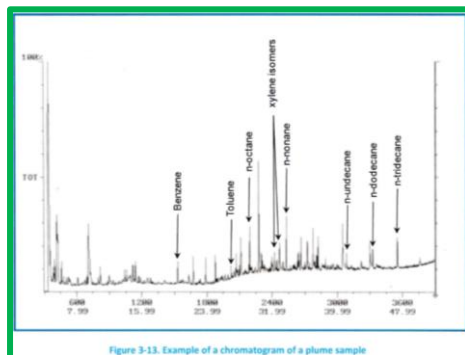
Priority 1

- ✓ Develop Hunter Valley Mine Blasting Protocols to “**Eliminate Visible Mine Blasting Plumes into the Atmosphere**” certainly as Visible Plumes rising above the Mine Working Void, by incorporating “Blast Hole Matrix Surface Disturbance” Video refinement that utilises (a) Smaller Blasts Volumes, (b) Improved Blast Hole Stemming Material & Depth by introducing Stemming effectual Calculation KPI’s limits. (e.g. Oresome articles)
- ✓ **Establish the Criteria that warrants Increased Evacuation Zones and specifically likely impacted Residents evacuation Zones** around Mine Blast Localities for Designated Planned Blasts adjudged by Weather Conditions, Mine Safety, and Plume Propensity to drift as a Hot Toxic Gas Bubble rather than Disperse within the Mine Lease and Buffer Zones environs.

The practical alternate is to eliminate these Visible Blast Plumes.

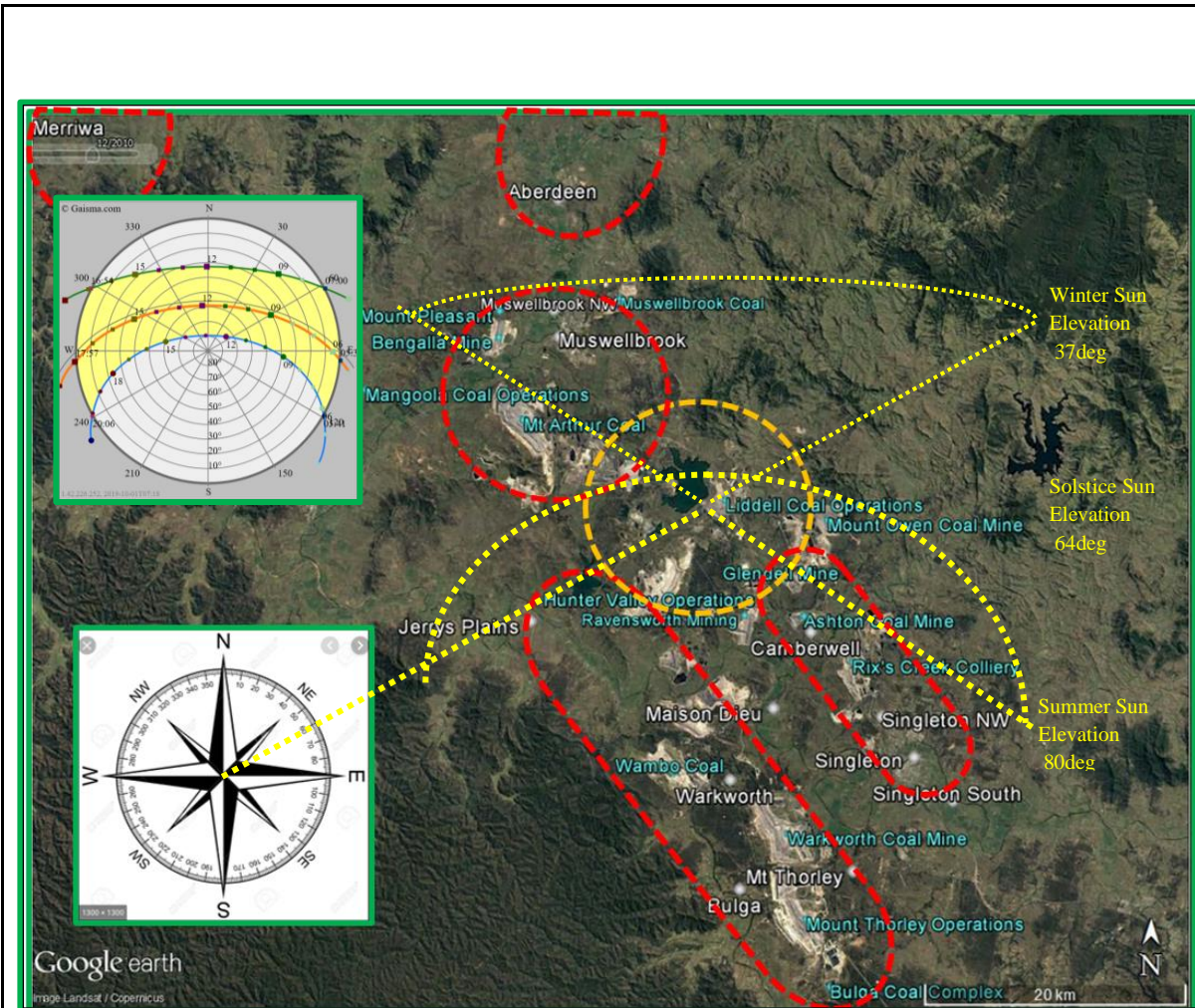
Analyse for Hunter Valley Mines, Complaints and Compliance Reports 2008 – 2019 to establish the Environmental Air Dispersion Stability Conditions that existed at the time leading up to and the Blast Plume Air Drifting downstream paths and Near Neighbours associated directions impacted by Blast Plumes returning to Ground.

Currently, Blasting Plume Toxic Gases, Dust and Particulate Matter, and Some Colourless Rated Plumes that return to Ground are adjudged as Fume; while the reality is that since 2010 Residents, Individuals and Mine Workers have been Hospitalised within 2 – 5 Km of Mine Blasts; other Residents report to Local GP’s they suffer severe Asthma attacks as close 2- 4 kms of Blast sites. Singleton and Muswellbrook Hospital Visits of breathing difficulties, same day or post 2 days of Blast complaints since 2007 identifies the Mine Blast Markers for this analysis.



ACARP Project C18034 Emissions from Blasting in Open Cut Coal Mining June 2013

- ✓ Expand the role of UHAQMN to provide a set of “**Air Pollution Mitigation Control Operations Displays**” that monitor, minute by minute and Alarm, the impending approach of **Accumulated Valley Air Pollution Expanse Pockets (Figure MD1&2)** to Mine Operations as they Drift towards Individual Mine Sites where elevated Resident’s Exposures downstream of these Mines currently show as UNAQMN PM10 exceedances.



2010 & 2016 UHAQMN review Dec 2016, Illustration of the Six Air Pollution Expanses

Figure MD1 with Solar Exposure orientation

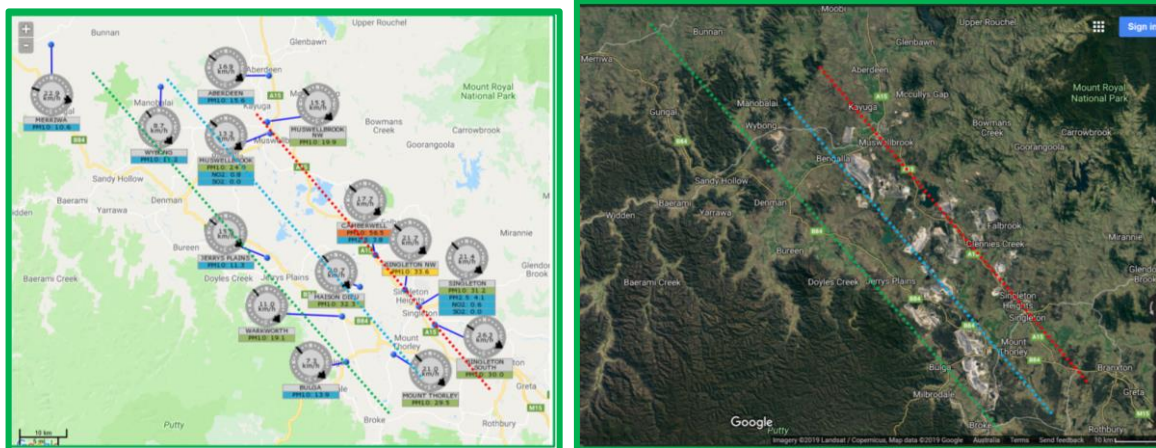


Figure MD2 Predominant North West – South East Valley Air Pollution Drifting Patterns

- ✓ Incorporate Mine Control Centre, Red, Amber & Yellow Alarms designed to alert Mine Controllers for the progressive Shutdown of Mining Operations as “Valley Cumulative Air Pollution Expanses” should they Drift across individual Operating Mines, that would yield at downstream UHAQMN Monitors Daily Average 50ug/m3 PM10 NEPM standard exceedances; and or exceed a 1 Hour Average of say 75ug/m3 PM10. Incorporate the “NEPM “Goal of reducing the 1 Year and 24 Hour PM2.5 Standard from 8 to 7ug/m3 and 25 to 20ug/m3, respectively by 2025”.
- ✓ Expand the role of UHAQMN to provide Mitigation Control protection for Camberwell Resident’s excessive UHAQMN PM10 & PM2.5 Exposure by the inclusion of a sigma theta composite Met Station, with PM10 & PM2.5 continuous Monitoring just North West of Glendell Mine to provide for Ravensworth, Mt Owen – Glendell Mines Progressive Shutdown Mitigation Controls. (also, Rixs Creek Mine South East of Camberwell)

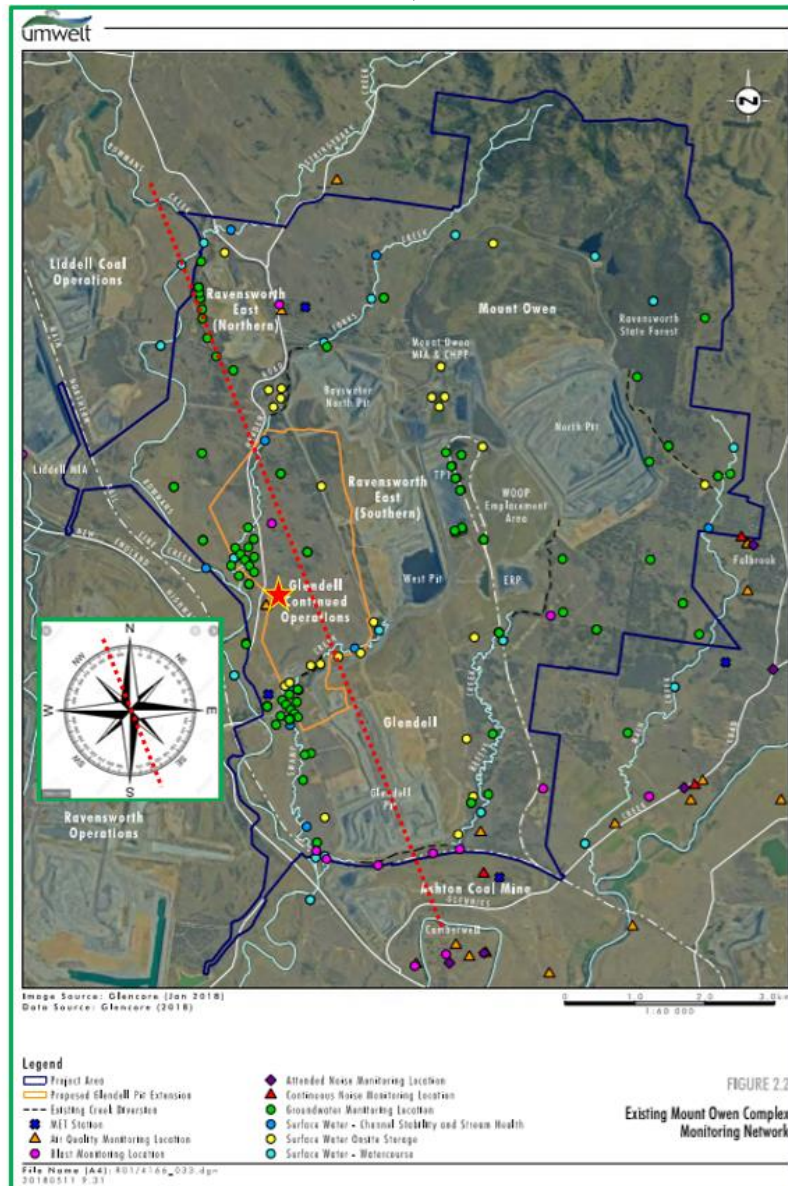


FIGURE 2.2
Existing Mount Owen Complex
Monitoring Network

- ✓ Provide [All of Mine Region Pollution Mitigation Options](#) to address Upper Hunter Valley Resident's Cumulative Pollution Exposures, including the Power Stations Plume Dispersion Stability contribution to the observed poor Pollution Dispersion UHAQMN Trends. The formation of “*Six Valley Haze and Mine Dust Drifting Pollution Expanse Pockets*” that Drift across Operating Mines, are evidenced as UHAQMN occasional Daily exceedances on Camberwell, Maison Dieu, Jerrys Plains and Singleton Residents, and their associated Disease Impacts.
- ✓ [Standardise Individual Mine Air Quality Environmental Control Centres Facilities to continuously Monitor and Mitigate by responding to Three Stage Alarming – Red, Amber, Yellow](#) to address Singleton Shire Resident's 2019 Concerns related directly to take into account the *Cumulative Disease Impact* from Open Cut Mining for each of the following Health Concerns in Priority Order: 1. Air Pollution at ground level Exposure & Disease, 2. Mine Low Frequency and Character Noise & Vibration with sleep disruption 3. Water Contamination incl Rainwater Tanks, and 4. Sense of Place & Social Impact and dislocation.

Objectives Stage 1 by 2020

Priority 2

- ✓ [Develop Operational Alarms by the analysis of UHAQMN 2012-2019 1 Hour PM10 Data](#) so that Mines can continuously trace their Air Pollution Drifting Patterns from their Emission sources, and understand the Air Pollution Drifting Patterns both entering and exiting their Mine leases, and especially Cease Operations where any Resident Localities impacted by these changing Air Pollution Drifting Patterns are exceeding NEPM guidelines.
This extends The EPA Spring 2017 trial defined high dust risk as a 24 hour average increment of PM10 between Merriwa and Singleton of 25µg/m3 or more. Mines also recorded PM10 upwind and downwind of each mine site during the trial, and the mass of material moved at each mine on each day. This was a measure of the level of activity at each site. Mines will complete optimisation of mine-operated monitors by 1 September 2017, establishing continuous PM10 monitoring, unwind and downwind of mining activity.
- ✓ [Establish Miners & Community Education Training Regime focusing upon Community Health and Individual Mine Mitigation connectivity to their Near Neighbour Resident's Exposure](#) to Drifting Mine Air Pollution associated WHO Human Disease Propensity “KPI's”, with PM10 the indicator of Mine Dust intensity; PM10-2.5 (Coarse) from Blasting, Fugitive Emissions, Draglines, Shovels & Dump Trucks with WHO Disease Impacts; PM2.5 (Fine) WHO Disease Impacts; PM2.5 – PM1 – PM0.1 Diesel Exhaust & Aerosols WHO Disease Impacts; PM0.1 Nano Diesel Particles Disease Impact; Gases, CO, NOx, SOx, O3, PAH's, etc; Vapours, Moulds & Spores.

[Minerals Council Air Video https://youtu.be/q4TojwxKVRQ](https://youtu.be/q4TojwxKVRQ)

Some references suggest the following PM size distribution of Airbourne Particulate matter from Mining is associated with certain pathway penetration Health Risks.

PM size	Airbourne Dust Size Distribution		Dust Mass Distribution	
	PM %	Pathway Penetration	Mass %	Mass Size umetres
PM50	55%	Inhalable fraction	90%	90.4 (PM90)
PM10	20%	Fine fraction	50%	21.4 (PM20)
PM4	5%	Respirable fraction	10%	4.5 (PM4)
PM2.5	1%	High risk, children & CNSLD suffers		

SSHHEG NTH

27/10/2010

Page 15

- ✓ Develop Pollution Mitigation Strategies to address the Community Representative Report:-
 - “Air Quality and living with coal mines: insights from the Bulga community”
 - Mr Krey the Community Member of Upper Hunter Air Quality Advisory Committee reported in the 22nd November 2018 meeting:
 - The main objective of air quality management is to protect human health and it is a basic human right to breathe clean air and live in a healthy environment.
 - Coal mining is the main source of air particles in NSW. PM10 levels increased at most Upper Hunter sites during the past three years. Annual PM2.5 is consistently above the benchmark in Muswellbrook and is nearing the benchmark in Singleton.
 - Mines seem unwilling to accept responsibility for Hunter air quality, Local government should be more vocal in raising concerns about air quality. State government is not trusted to regulate air quality. The Upper Hunter Mining Dialogue has not produced results. OEH’s categorisation of air quality is misleading because there is no safe level of particulate matter.
 - Mr Krey suggested that the committee be more active in making recommendations on how to reduce air pollution in the Hunter Valley. He suggested debating and making recommendations on the following issues:
 - Local EPA compliance officers.
 - Using drones for mine surveillance.
 - Mine and power station expansion.
 - Complaint responses.
 - Involvement of mining representatives to recommend ways to reduce pollution.
 - Increased mine rehabilitation.
 - Back-filling mine voids.

Days above benchmark concentrations

There were 29 days over the PM₁₀ benchmark in winter 2018, with sites closer to mines recording the highest number of days. There were two days over the PM_{2.5} benchmark in winter 2018.

Table 1 Number of days above the relevant national benchmarks – winter 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 ppb benchmark]	SO ₂ daily [8 ppb benchmark]	NO _x hourly [12 ppb benchmark]
Population centre	Aberdeen	0	-	-	-	-
Population centre	Muswellbrook	4	2	0	0	0
Population centre	Singleton	3	0	0	0	0
Smaller community	Bulga	1	-	-	-	-
Smaller community	Camberwell	19	0	-	-	-
Smaller community	Jerrys Plains	0	-	-	-	-
Smaller community	Maison Dieu	9	-	-	-	-
Smaller community	Warkworth	1	-	-	-	-
Smaller community	Wybong	2	-	-	-	-
Diagnostic	Mount Thorley	15	-	-	-	-
Diagnostic	Muswellbrook NW	1	-	-	-	-
Diagnostic	Singleton NW	6	-	-	-	-
Background	Merriwa	1	-	-	-	-
Background	Singleton South	3	-	-	-	-

µg/m³ = microgram per cubic metre and ppb = 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

There were 13 days over the PM₁₀ benchmark in autumn 2019, with all sites recording days over the benchmark. There were no days over the PM_{2.5} benchmark in autumn 2019.

Table 1 Number of days above the relevant national benchmarks – autumn 2019

Station type*	Station	PM ₁₀ daily [50 µg/m ³ benchmark]	PM _{2.5} daily [25 µg/m ³ benchmark]	SO ₂ hourly [20 ppb benchmark]	SO ₂ daily [8 ppb benchmark]	NO _x hourly [12 ppb benchmark]
Population centre	Aberdeen	2	-	-	-	-
Population centre	Muswellbrook	3	0	0	0	0
Population centre	Singleton	2	0	0	0	0
Smaller community	Bulga	2	-	-	-	-
Smaller community	Camberwell	8	0	-	-	-
Smaller community	Jerrys Plains	2	-	-	-	-
Smaller community	Maison Dieu	3	-	-	-	-
Smaller community	Warkworth	4	-	-	-	-
Smaller community	Wybong	2	-	-	-	-
Diagnostic	Mount Thorley	10	-	-	-	-
Diagnostic	Muswellbrook NW	3	-	-	-	-
Diagnostic	Singleton NW	5	-	-	-	-
Background	Merriwa	3	-	-	-	-
Background	Singleton South	4	-	-	-	-

µg/m³ = microgram per cubic metre and ppb = 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

Objectives Stage 2

Priority by 2030

- ✓ Develop Mitigation Controls for all Mining Operations to meet evolving WHO Guidelines & NEPM Standards using a “*Mine Surrounding PM10 & PM2.5 Networks Day & Night Patrols alongside Noise Alarm Patrols*” for each Near Neighbour Resident’s Protection, or otherwise at 30degree quadrants. Specifically, cater for the 1 Year & 24 Hr PM2.5 Standards lowering from 8 to 7 ug/m3 and 25 to 20 ug/m3 respectively by 2025.
- ✓ Evaluate Mine and Valley Cumulative Air Pollution consecutive days of accumulated “Valley Haze and Mine Dust Drifting Expanses” by Analysis for the 2012 – 2019 Years of UHAQMN 10 Minute to 1 Hour PM10 & PM 2.5 Data Patterns, and establish Mine Mitigation Options by [Prediction and Reactive Mitigation Control coordinated across all Mining Sites to achieve Valley wide NEPM Standards Compliance](#). Pollution Expanse Pockets already considered are: NW Valley Cassilis to Merriwa, NE Valley Scone to Aberdeen, North Muswellbrook Region, Central Power Station Region, SE Corner Camberwell to Singleton South, and SW Corner 5 Mines Region. **(Figure MD1)**
- ✓ Develop detailing for [Mine Control Centre Alarm Displays \(15 Minute based\) at Individual Mines referencing the Location Direction and Distances of their Near Neighbours Residents](#), Wind Drifting Pathways, Dispersion Stability, with three stage Pollution Mitigation Alarms based on the extent that PM10 values exceed 50ug/m3 PM10 and 25ug/m3 PM2.5 for any contiguous 24 Hr period at Residents localities throughout the Upper Hunter Valley; Analysis of Particulate Monitors 1 Hour and Rolling 24 Hour Particulate Matter of the UHAQMN 2012 – 2019 Years and all other individual Mine Particulate Monitors.
- ✓ Evaluate the [Mine Mitigation Option for Mines to continuously at 5 or 10 Minute intervals, Pathway Trace and Control by reducing their Air Pollution Drifting Patterns at Mine Emission Sources; their Air Pollution Dispersion Patterns both entering and exiting their Mines; and especially Cease Operations where at any Resident Localities they are known to be impacted for one hour by any changing Air Pollution Drifting Patterns that exceeding say 75ug/m3 PM10 one hourly Average exiting the Mine](#).
- ✓ [Expand the role of UHAQMN to provide Mitigation Control protection for the entire Upper Hunter Valley impacted by Coal Mining and Coal fired Power Stations](#) by the inclusion of a sigma theta composite Met Stations, with PM10 & PM2.5 continuous Monitoring at all sites; adding Cassilis, Scone, Denman, Broke, Glendon Brook and Cessnock for Residents Air Quality protection. Incorporate Singleton (Defence), Cessnock & Scone Airports, Merriwa (Roscommon), Murrurundi Gap, and Mt Pleasant Public-School Met Stn. Sites.

- ✓ Develop **Modern Dispersion Visualisation Real Time Displays and Dispersion Parameter Studies** to reintroduce the Data Intelligence to the Movement of Mine Pollution from Sources to Dispersion, and to provide the basis for the development of Real Time Air Pollution Dispersion Characterisation Studies.

Hunter Valley Coal Mining Air Pollution Dispersion (Concept)				
Air Pollution Dispersion	HIGH A D	Medium	LOW G	Instability A Neutral D Stability G
SEASON	SUMMER Nov Dec Jan	Feb Mar Apr Oct Sept Aug	WINTER May June July	
Time of Day DST +4Hr	3Pm Noon 7pm 4Pm		Night	Diurnal
Air Temperature	45°C 38°C		Day Minimums	
Solar Radiation	A HIGH Mid afternoon	Medium D	LOW Cloudy G	Sunrise – Sunset TOD
Sun Elevation	Summer 80 deg	Solstice 64 deg	Winter 37 deg	North facing
Local Wind Speed	>5m/sec Horiz. Dispersion	D 2-3m/sec	Still/ CALM G	Modelling limited at low Wind F
Turbulent Boundary Layer	A Therm Updraft 1000m Layer		Near Ground 100m Layer	Mixing Height Determinate
Recent Rain Events	DRY		➤ mm/Hr in last 8 Hr	
Elevation Gradient	Deep Mines Valleys & Cliffs	Stockpiles Orientation to N	Flat Plains	Complex Terrain limitations
Surface Drifting	>6m/sec Horiz Dispersion		CALM	
Air Stability Class	Instability A	Neutral D	Stability G	Horiz./Vertical Drift Balanced in Class D

- ✓ Expand the role of UHAQMN to provide NSW Health Disease Risk Evaluation at Muswellbrook, Singleton and Cessnock for Ozone, and PM1.0 with PM2.5 referenced continuous Monitoring and Particle Filter Particulates Microscopy and Composition, especially for Diesel Particle Emissions, Elementary Carbon, Nanoparticles and Substance Type Analysis.

Diesel exhaust particles are primarily composed of elemental carbon, with a smaller proportion of organic carbon and toxins (such as PAH and nitro-PAH, aldehydes, ketones and heavy metals) ad/ab-sorbed to the primary (amorphous elemental carbon) particles. Many of these components are created through incomplete fuel combustion and unburned engine lubricating oil. Particulate matter PAH's, aldehydes and ketones are implicated as major contributors towards diesel exhausts carcinogenic effects.

Application of Modern Technology & Science to Dispersion

Our Holistic investigations into the establishment of Power Stations and Open Cut Coal Mining in the Hunter Valley – a decision in 1981 related to the expanded role of NSW Electricity Commission in exploiting of Coal Resources for sale and to reduce the Cost of Electricity Generation in NSW.

Unearthed in the investigations was the need for the Australian University to show that Mining, Power Stations and Aluminium Smelters Air Pollution could be Dispersed upward into the atmosphere in the somewhat enclosed Hunter Valley. While this USEPA based Air Pollution Dispersion Modelling is still used for Mine Approvals and Residents Acquisition Rights, the understanding has not progressed beyond that approach.

Modelling however is based upon their Fixed location Meteorological reference Data, which has little provision for the subsequent horizontal downwind Drifting Air Dynamics that unfolds as Pathways across the contours of mine leases and over Near Neighbour properties.

Certainly, the use of Minute to Minute Real Time Mine Air Pollution Drifting Visualisation is much closer to the reality of the Pathways that result; seen in Resident's Complaints, and even a casual inspection of the UHAQMN Maps over time – exposes that "Dispersion into the Atmosphere" is indeed the heart of the problem.

Stability class is used to determine the rate at which the Air Pollution "Plume" disperses by growth by the process of Turbulent Mixing.

Modern Dispersion Visualisation Displays and Dispersion Parameter Studies in Real Time proposed here would reintroduce the Data Intelligence to the Movement of Mine Pollution from Sources to Dispersion. i.e. Actual Measurements compared to Modelling!!!

What has been gleaned so far from UHAQMN Data and OEH Reports since 2011?

Traditionally Mines rely upon Air Pollution Dispersion updraft by Thermals into the Atmosphere or Buffer Zones for Horizontal Dispersion; however without Buffer Zones the UHAQMN Data indicates that Dispersion occurs Horizontally across Near Neighbours downwind and/or Accumulates in Still and/or Sunless Conditions.

Proposed here are Mine Control Displays that Monitor and Alarm for High, Medium and Low Mine Dispersion Status Conditions based on each of the following Parameters for example:- Season, Time of Day Diurnal, Air Temperature Diurnal, Local Wind Speed, Solar Radiation Flux, Recent Rain events, Topography, Emission Source Elevation and Turbulent Boundary Layer.

Dispersion physical parameters that are measured directly by instrumentation and can be Displayed and Alarmed, include Surface and Air temperature, dew point, wind direction, wind speed at 10m, cloud cover, cloud layer(s), ceiling height, visibility, current weather, precipitation, Diurnal cycle, Sunrise to Sunset Solar Radiation, Night and cloud cover, Seasonal variations- Low May to July, and High Nov to Jan.

"Higher, more positive values of surface heat flux (classes A to C) indicate the presence of upward thermal air currents, which aid a real dispersion.

Comparably lower and negative values of surface heat flux (classes E to G) prevent the particulate plume from rising into the atmosphere and restrict areal dispersion".UK Appleton 2006

Air Pollution, Emissions and Health Background

World Health Organisation Precautionary Guidelines for Human Exposure to Air Pollution Disease Impacts, emerged after 40 years of Medical Research in October 2013 – *“There is no evidence of a safe level of exposure or a threshold below which no adverse health effects occur- it is necessary to reduce health risk to a minimum”*; while in the Hunter Valley Mining Companies and the Community were being advised since 2005 that there was *“No Convincing Evidence”*.

Five Years later in 2018, NSW Authorities now spruik these WHO, IARC and Lancet Carcinogenic and Minimisation relationships between Air Quality Particulate Matter and Community Diseases associations; and now as more targeted Research occurs, the WHO review since 2016 is expected to further lower their Precautionary Guidelines which will challenge Hunter Valley Mining Operations that are imbedded within Populated Rural Localities.

The Air Pollution Particulates and Combustible Gasses Toxic Emissions Mix Dispersion rely upon suitable Atmospheric Stability in the somewhat enclosed Rural Hunter Valley; namely for Power Station Stack Emissions & Fly Ash Particulates, Open Cut Mining Blast Plumes, Diesel Exhausts, Operational Dust, Fugitive Emissions, Windblown Emissions, Highway & Railway Emissions, and the Aerobiological Calendar, all setting this area aside from all other Urban Pollution Mixes.

In the last ten years the Overall Specific Hunter Valley Air Pollution Studies, along with the WHO associated Disease Propensity References, listed below, provides the focus here for better Emission Source Minimisation Controls. Consequently, Mines will need to accept greater responsibility for the Cumulative Particulate Pollution exiting their Mines as they drift downwind at ground level over Resident’s Localities.

- NSW Chief Health Officer Expert Panel Investigations of SSHEG 2009 submission
- **World Health Organisation 2013**, *“Health Effects of Particulate Matter”*, No evidence of a safe level ... it is necessary to reduce Health Risk to a Minimum.
- **ACARP 2013**, *“Emissions from Blasting on Open-Cut Mining”*, CSIRO Energy Technology, C18034 S.Day et al, June 2012 -Blasting Plume Emissions Composition; and C22025 *“Real Time Monitoring and Prediction of Open Cut Blast Fumes”*.
- **NSW Health, OEH 2013**, *“Upper Hunter Valley Particle Characterization Study”*, Hibbard & Cohen CSIRO & ANSTO, 17 Sept 2013.
- **IARC Vol 105 2014**, *“Diesel and Gasoline Engine Exhausts and some Nitroarenes”*, IARC Monographs on the evaluation of Carcinogenic Risks to Humans.
- **NSW EPA 2014**, *“Upper Hunter Air Particle Model”* 9 Oct 2014; Pacific Env. Ltd, 2012 UHAQMN with Wind Speed, Mine & Diesel Emissions - CALPUFF.
- **Hunter New England Population Health, NSW Health Nov 2014** *“Investigating the Health Impacts of Particulates associated with Coal Mining in the Hunter Valley”*, CB Dalton, DN Durrheim, G Marks, CA Pope III, Air Quality and Climate Change Volume 48 No 4. Nov 2014 Pg. 39-43.

- SSHEG “*Rural Health Study Review July 2015*”, SSHEG to NSW Health 11 Aug 2015 including Mining Dialogue Review May 2015.
- NSW Health, EPA 2015, “*Review of the health impacts of emission sources, types and levels of particulate matter air pollution in ambient air in NSW*”, Woolcock Institute of Medical Research, Centre for Air Quality and Health Research and Evaluation (CAR); Neil Hime, Christine Cowie, Guy Marks, Dec 2015.
- NSW EPA 2018, “*Review of Coal Fired Power Stations Air Emissions and Monitoring*”, and EPA Licences Attm B, March 2018.
- M. Power Thesis 2002, “*Air Pollution Dispersion within the Tamar Valley TAS*”.
- Uni Newcastle 2018, “*The Health Burden of Fine Particle Pollution from Electricity Generation in NSW*”, Dr Ben Ewald Nov 2018.
- Woodcock Institute 2018, “*A Comparison of the Health Effects of Ambient Particulate Matter Air Pollution from Five Emission Sources*” (with listed Reference Research Table 1 & 3 illustrated)
- ✓ [Neil J. Hime](#)^{1,2,*}, [Guy B. Marks](#)^{1,3,4} and [Christine T. Cowie](#)^{1,3,4}; [Int J Environ Res Public Health](#). 2018 Jun; 15(6): 1206.
- ✓ **Extract related to Source Specific Health Impacts Page 16:** “*This review has a focus on epidemiological studies that compare different PM emission sources. However, toxicological studies in humans and research animals will help to inform the likely health effects of exposure to source-specific PM. Unlike epidemiological studies, toxicological studies have the advantage of being able to associate effects with precise exposures. Their disadvantage is that they lack the “real-world” conditions within which population relevant exposures occur. It is likely that no one study type will be able to determine the relative health effects of PM from different sources, and that only the cumulative evidence from a range of study types, each with different strengths and limitations, will provide some clarity in this area.*

Research described in this review has linked a variety of health effects to source-specific PM. However, more advanced approaches to modelling, measurement, and statistics will be required to more precisely quantify health effects attributable to exposures in the multi-pollutant atmosphere. Determination of the relative health effects of different source-specific PM will help to inform policy and regulatory strategies to reduce the public health burden of ambient PM. Enhanced understanding of these relative health effects offer the potential for better targeted public health protection than the current recommended practice of minimising exposure to total PM mass, regardless of the source”.

Table 1. Conclusions from previous reviews of the differences in the health effects of different components and sources of PM air pollution.

Reference	Study Conclusions in Relation to Health Effects of Source-Specific PM Air Pollution
[38]	The black carbon, for which vehicles and particularly diesel vehicles are a major source in urban areas, in PM might make PM from those sources the most harmful. The relative toxicity of wood smoke compared with vehicle exhaust emissions is unclear.
[29]	Current evidence does not allow a precise differentiation to be made as to which constituents or sources of PM are most closely related to specific health outcomes. However, three components, black carbon, secondary organic aerosols, and secondary inorganic aerosols may be important contributors to PM toxicity.
[39]	Current knowledge does not allow precise quantification or definitive ranking of the health effects of PM from different sources. However, some results suggest that a range of serious health effects are more consistently associated with traffic-related PM and specific metals and elemental carbon in PM.
[40]	There is a lack of information by which to differentiate the toxicity of different components of PM.
[41]	Evidence suggests that carbon components and several metals in PM are associated with health effects however it is unclear whether these components are responsible for health impacts or they are surrogates for other pollutants.
[31]	Cardiovascular health effects may be associated with PM _{2.5} from crustal or combustion sources, including traffic, but at this time, no consistent relationships have emerged. Collective evidence has not yet isolated factors or sources that would be closely and unequivocally related to specific health outcomes.
[42]	There is evidence that metals within PM affect health but considerable uncertainties about causality remain.
[43]	Evidence relating to the toxicity of inorganic components of PM _{2.5} is not consistent. Crustal components of PM _{2.5} are not likely, by themselves, to be a significant health risk.
[44]	Public health will likely be better protected by reduction of various vehicular emissions than by regulation of total PM _{2.5} mass as if all PM _{2.5} is equitoxic. However, the knowledge base is incomplete.
[45]	There is little support for the idea that any single major or trace component of PM is responsible for the adverse health effects of PM.

From previous reviews of the differences in the health effects of PM from different sources it is unclear if there is a hierarchy in the harmfulness of PM from different sources. Therefore, this current review was undertaken with the following objectives:

Table 3	
Summary of PM emission sources and reported health and physiological/toxicity effects (physiological/toxicity effects includes animal studies).	
Specifically traffic PM	all-cause, respiratory and cardiovascular mortality, cardiovascular, stroke and heart failure morbidity [54,55,56,57,58,70,71,72] cardiovascular toxicity and various cardiovascular effects [50,60] cytotoxicity, pulmonary inflammation [62,63]
Coal-fired power stations	all-cause, cardiovascular, respiratory, ischaemic heart disease, pneumonia, lung cancer mortality [19,34,57,58,69,70,71] respiratory morbidity [48,49,65,66,67,68,72] cardiovascular morbidity [48,49,68]
Diesel exhaust	respiratory mortality [54] lung and oesophageal cancer mortality [84,85] allergic inflammation, asthma symptoms, lung cancer [79,81,82,83] cardiovascular morbidity [72,89] cardiovascular changes indicative of increased coronary event risk, changes in lung function, nose and throat irritation [48,49,90] atopy and susceptibility to infection [98,99,100] effects on offspring from exposure during pregnancy [101,102,103]
Domestic wood combustion heaters (studies of outdoor exposure to heater emissions)	respiratory symptoms and exacerbations [109,110,111,112,113,114] cardiovascular morbidity [72] respiratory morbidity [115] compromised lung immunity, airway inflammation [112,116,117,118]
Crustal dust	all-cause and cardiovascular mortality [120,121,122,123,124] respiratory mortality(>75 years of age) [141] respiratory and COPD morbidity [127,137,138] asthma exacerbation [125,132,133,134,135,136] reduced lung function in children [151] pneumonia [142,143] lung inflammation [147,148] infectious disease [144,145,146]

Resources required

Provide a brief description of the resources required from the Dialogue to facilitate the project's success. For example, time, personnel, target groups. Detail any external financing or in-kind contributions sought.

- **Project Duration:-** Intended as a two year Dialogue Project :
One year of draft preparation of forward-thinking strategy,
Second year of Implementation Trial and review.
- **Target Groups:-** Dialogue team with the appropriate UHAQMN involvement and knowledge, and Mine Operational Environmental Control Centre involvement for Screen Display Trials of three Stage Alarms and Dispersion outcomes.
- **Project Benefit:-** Project relates directly to the integration the Mine Operational Centre Strategy to Lower the overall Air Pollution Levels, fewer UHAQMN Exceedances, and Recognition of Community Health improvements by Local GP's.
- **Requires**
 - Initial Minerals Council and Mining Dialogue agreement in principle, and
 - Connects directly with the Cumulative Health Impacts of "Air Quality and Emissions and Health"; as discussed and detailed at 2018 Annual UHMD Forum Report.

Other information

Other Information

SSHEG and Health Concerned Residents as “Near Neighbours to Open Cut Mines” are asking the Question: -

“Why after 10 years of Community detailing the observed Diseases impact of sudden exposure to Mine Air Pollution; three years NSW Health, CSIRO & ANSTO Research 2010 -2013; WHO Air Pollution & Disease Declarations Oct 2013; eight years Upper Hunter Mining Dialogue, Mines, EPA & OEH initiatives 2011- 2017; after all this combined effort; why are Singleton GP’s again reporting worsening Community Disease in 2019?”

SSHEG 10year review concludes that each individual Mine now operate, targeting not to exceed their Daily 24 Hr Average PM10 at midnight of 50ug/m³(Compliance), however their “*actual Cumulative 1&24 Hr Average PM10 that Residents are exposed too*” often range from 70 - 150ug/m³, because the Valley inflow PM10 from other upstream Mines has been conveniently ignored as inconsequential somehow! **The Cumulative Polluted Air is the so-called Healthy Air we Breathe criteria!**

Independently the World Health Organisation Scientific Advisory Committee and Expert Reviewers on Air Quality in October 2013 declared “*There is a linear Dose-Response Relationship between Particle Levels and Human Disease with No Threshold that is Safe*”; having previously in June 2012 declared “*Diesel Engine Fumes can cause Lung Cancer and belong in the same potentially deadly category as asbestos, arsenic and mustard gas*”.

It is clear that insufficient Mine Industry Pollution Mitigation Controls has adopted the precautionary guidelines of the World Health Organisation Air Pollution and Human Disease associations. Additionally, the Community identified Priority Air Quality Action List summarised in 2014 in Tables 1 & 2, has been mostly ignored.

What the Community of Singleton Shire is asking of the Mining Industry is that at all times for Resident’s PM10 not to exceed the NEPM 50ug/m³ limit, and that Mine further operate well below this upper limit to “Minimise the PM10 and PM2.5 Rate of Rise frequency” at UHAQMN Continuous Monitoring localities where Residents are being excessively exposed to Mine Air Pollution Drifting Patterns.

Therefore, both PM10 and PM2.5 Monitoring of known Mine Blast Fume & Odour Resident Localities, and other Near Neighbour Air Pollution localities now, and in the future, will become mandatory for Community Disease Protection.

What are the SSHEG 2014 Priorities

- (a) Elimination of Mine Blasting Plumes into the Atmosphere
- (b) “Near Neighbours to Mining “as “Occupationally Exposed Persons”.
- (c) Air Quality Particulate Matter as 15 Minute Avg STEL based.
- (d) Holistic Air Quality Toxicity – Gases, Vapours, PM’s, as STEL.
- (d) Air Quality Australian Standards – SSHEG Rural Zones Proposal

SSHEG	PM10	Annual Avg 12ug/m3,	Daily Avg 25ug/m3
Proposal	PM2.5	Annual Avg 6ug/m3,	Daily Avg 15ug/m3
(Rural)	PM10-2.5	Annual Avg 8ug/m3,	Daily Avg 20ug/m3

- (e) Scientific Biological versus Air Pollution Asthma Study
 - Pollens, Spores, Fungi, Vapours, Fragrances etc
 - Bushfires & Backburning, Forests, Grasslands, Biomass Smoke etc
 - Domestic Heaters, WoodSmoke

Mining Dialogue Meeting 17 Feb 2019

➤ Australian Air Quality Standards were subsequently lowered

Following much review and consultation, the Air NEPM, which had been last updated in 2003, was amended on 4 February 2016 with the following changes:

- The PM_{2.5} standards were upgraded to performance standards from their previous status as advisory reporting standards.
- A standard for 1-year average PM₁₀ of 25 µg/m³ was added. This complements the existing standard for 24-hour average PM₁₀ of 50 µg/m³.
- The allowance for exceedance of the PM standards on a maximum of 5 days per year was replaced by an ‘exceptional event rule’. An exceptional event is a fire or dust occurrence that adversely affects air quality at a particular location; causes an exceedance of 1-day average standards in excess of normal historical fluctuations and background levels, and is directly related to bushfire, jurisdiction authorised hazard reduction burning or continental-scale windblown dust.
- A goal was added of reducing the 1-year and 24-hour PM_{2.5} standards from 8 to 7 µg/m³ and 25 to 20 µg/m³, respectively, by 2025.
- A PM_{2.5} population exposure metric was added, to be reported on annually from June 2018. Development of this metric is still in progress, but a nationally consistent approach will be used for evaluation and reporting based on agreement by participating jurisdictions.

The jurisdictions (6 states and 2 territories) monitor air quality at about 75 locations across Australia. These stations are in the major metropolitan areas and some regional centres, and are sited to measure air quality that is representative of that likely to be experienced by the general population in the region. Jurisdictions report annually on their compliance with the Air NEPM based on the data from their monitoring networks.⁴ Some jurisdictions have additional monitoring networks, such as the NSW Upper Hunter Air Quality Monitoring Network (OEH 2016), but results from these stations are not included in the above compliance reports.

Particles in ambient air range in diameter from approximately 0.001 micrometres (μm) to about 30 μm . Figure 2-1 shows the size range of typical particles and gas dispersoids (Lapple, 1961).

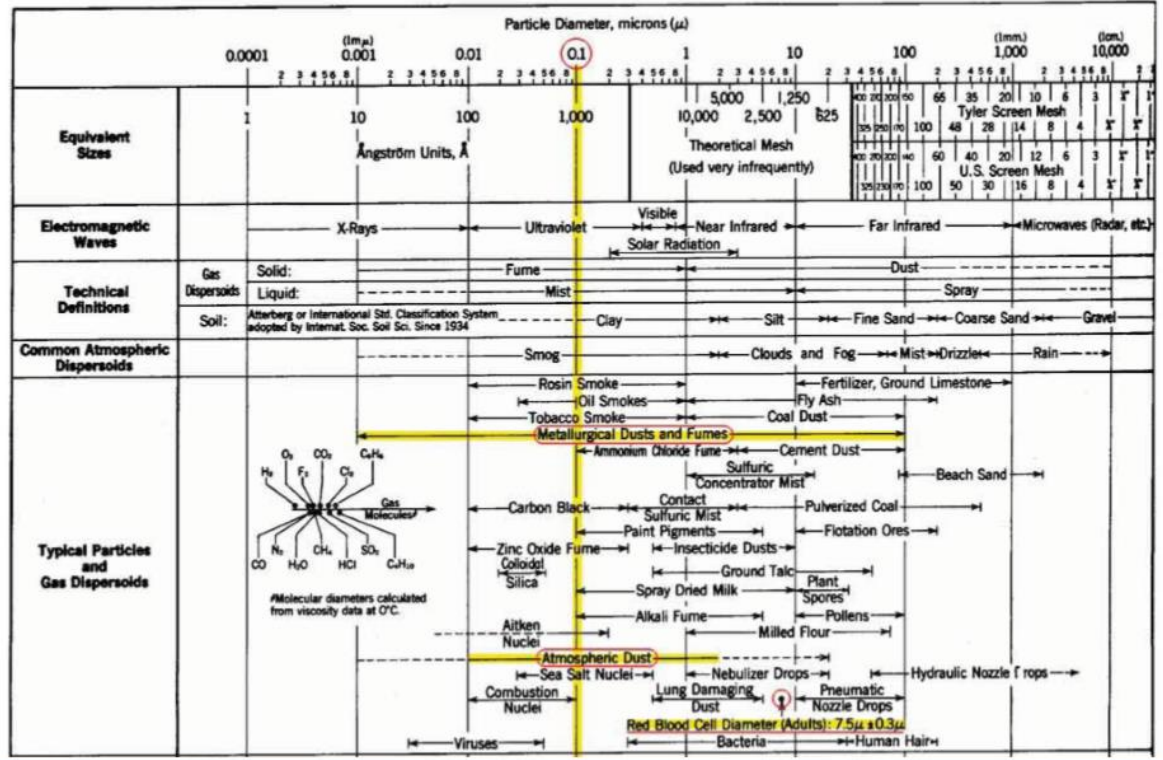


Figure 2-1: Characteristics of typical particles and gas dispersoids

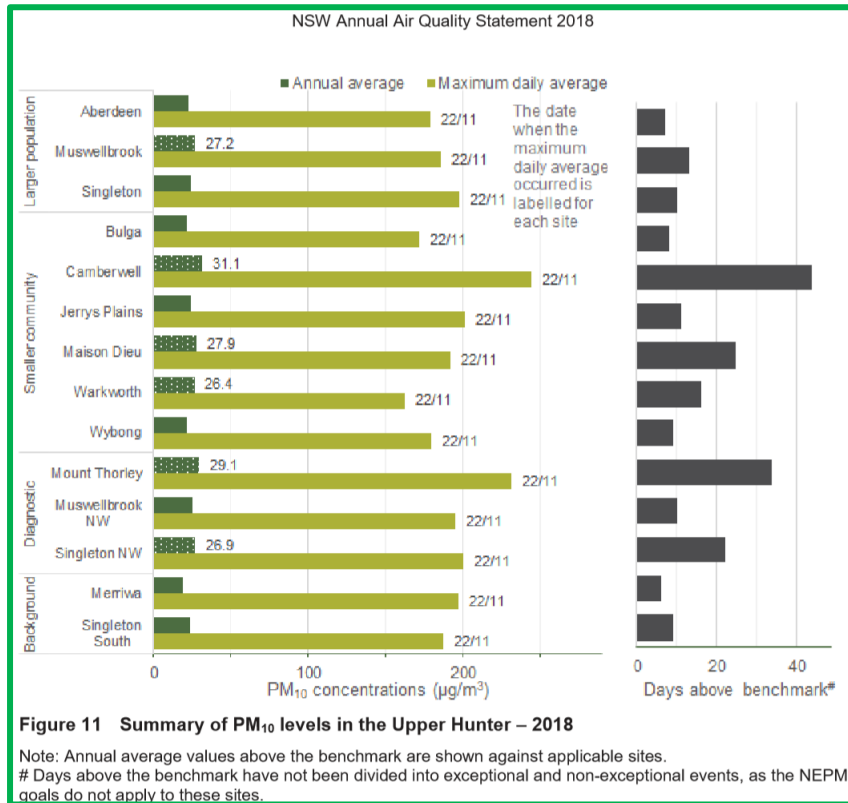


Figure 11 Summary of PM₁₀ levels in the Upper Hunter – 2018

Note: Annual average values above the benchmark are shown against applicable sites. # Days above the benchmark have not been divided into exceptional and non-exceptional events, as the NEPM goals do not apply to these sites.

ICC 8 - 4 FRASER ET AL.: VARIATION IN COMPOSITION OF DIESEL PARTICLE EMISSIONS
Table 5. Molecular Composition of Organic Particulate Matter Emitted From Four Diesel Vehicles Under Load and for a Compositd Idle Sample^a

Compound	HEB 7242	HEB 7238	Idle	Metro	School
<i>n-Alkanes</i>					
n-heptadecane	420	480	680	3560	1120
n-octadecane	430	650	1240	3260	2100
n-nonadecane	960	820	2210	6160	4740
n-eicosane	1820	1500	3670	6300	11910
n-henicicosane	2750	2850	5950	6610	12500
n-docosane	2400	2860	4290	5750	7060
n-triacosane	1410	1760	2390	4260	3410
n-tetracosane	950	1210	1420	3250	1730
n-pentacosane	760	870	940	2510	1100
n-hexacosane	nd ^b	200	460	1480	400
n-heptacosane	nd	nd	290	950	150
n-octacosane	nd	nd	200	730	nd
n-nonacosane	nd	nd	160	450	nd
n-tricontane	nd	nd	nd	380	nd
<i>Petroleum Biomarkers</i>					
18 α (H)-22,29,20-trisnoncophane	210	200	140	110	160
17 α (H),21 β (H)-29-norhopane	850	760	430	240	720
17 α (H),21 β (H)-hopane	650	550	310	310	540
22R + S, 17 α (H),21 β (H)-30-homohopane	330	280	150	nd	190
22R + S, 17 α (H),21 β (H)-30-bishomohopane	240	210	110	nd	150
20R + S, 5 α (H),14 β (H), 17 β (H)-Cholestane	80	90	90	70	210
20R, 5 α (H),14 α (H), 17 α (H)-cholestane	50	30	40	60	120
20R + S, 5 α (H),14 β (H), 17 β (H)-ergostane	50	60	20	40	110
20R + S, 5 α (H),14 β (H), 17 β (H)-sitostane	70	70	60	50	190
<i>Oxygenated PAH</i>					
9(H)-fluoren-9-one	150	150	110	830	170
9H-xanthen-9-one	30	20	40	100	80
<i>Polycyclic Aromatic Hydrocarbons</i>					
Fluoranthene	87	115	43	525	53
Acephenanthrylene	18	31	1	4	4
Pyrene	214	283	71	471	130
Benzo[ghi]fluoranthene	16	15	8	24	18
Benzo[a]anthracene	12	13	91	137	70
Chrysene/triphenylene	24	28	117	161	100
Benzo[k]fluoranthene	11	7	153	160	128
Benzo[b]fluoranthene	8	7	134	168	113
Benzo[c]pyrene	2	nd	4	15	4
Benzo[a]pyrene	8	8	142	179	125
Benzo[ghi]perylene	9	8	177	284	161

^aCompound emissions are in ng compound per mg OC.

^bThe abbreviation nd stands for not detected.

Compound Emissions (ng per mg OC)
Real-World Particulate Matter and Gaseous Emissions
Table 5. Emission Factors from LD and HD Vehicles of Key Species from IMPROVE Samplers Along with Regression Uncertainty

Species	LD Emissions \pm SE (μ g/mi)	HD Emissions \pm SE (μ g/mi)
Hydrogen	2,090.38 \pm 1079.05	9,367.45 \pm 4,835.43
Sodium	3,834.55 \pm 337.84	-660.72 \pm -58.21
Magnesium	467.31 \pm 285.34	819.71 \pm 500.52
Aluminum	875.11 \pm 650.56	-124.71 \pm -92.71
Silicon	1,188.34 \pm 1,197.10	1,407.12 \pm 1,417.49
Sulfur	1,881.85 \pm 1,067.94	430.14 \pm 244.10
Chlorine	899.05 \pm 791.57	3,782.46 \pm 3,330.27
Potassium	443.17 \pm 593.33	834.52 \pm 1,117.27
Calcium	449.83 \pm 258.28	1,127.95 \pm 647.65
Titanium	83.29 \pm 36.31	402.00 \pm 175.23
Vanadium	11.99 \pm 8.53	14.23 \pm 10.13
Manganese	644.04 \pm 200.52	4,454.68 \pm 1,386.93
Iron	335.06 \pm 145.40	3,194.28 \pm 1,386.13
Copper	23.70 \pm 29.56	141.62 \pm 176.63
Zinc by XRF	73.23 \pm 49.07	219.86 \pm 147.34
Mercury	2.75 \pm 0.72	18.03 \pm 4.71
Lead	17.74 \pm 12.28	59.75 \pm 41.37
Selenium	17.72 \pm 9.44	-78.12 \pm -41.60
Bromine	-1.22 \pm -1.08	25.51 \pm 22.60
Strontium	-3.13 \pm -1.05	60.79 \pm 20.48
NH ₃	55.13 ^a \pm 29.21 ^a	42.62 ^a \pm 22.58 ^a
EC	5.32 ^a \pm 1.91 ^a	296.17 ^a \pm 106.47 ^a
OC	4.55 ^a \pm 1.75 ^a	179.84 ^a \pm 69.13 ^a

^a Measured in mg/mi.



Glenda Project – Weatherpak Ground Station

Coastal Environmental Wireless HazMat Weather Station



Sigma Theta Overview

Frank Pasquill took the next step, and determined levels of Sigma Theta for differing degrees of atmospheric stability. He created a seven tiered system from “A” to “G”, where Class “G” reflects the most stable atmospheric condition, to Class “A” which reflects the highest level of atmospheric in-stability.

His results are shown in the table below:

Stability Class	Description	Definition
1	A	Extremely Unstable
2	B	Moderately Unstable
3	C	Slightly Unstable
4	D	Neutral
5	E	Slightly Stable
6	F	Moderately Stable
7	G	Extremely Stable

Based on this Stability Class table, we can now make determinations of atmospheric stability based on ground station data and not have to rely on balloon launched radiosondes, or rocket launched payloads.

Table 8. DEFINITION OF THE PASQUILL ATMOSPHERIC STABILITY CATEGORIES

Surface wind speed at 10 m (m/s)	Day			Night		
	Incoming solar radiation	Strong	Moderate	Slight	Thinly overcast or $\geq 4/8$ low cloud cover	$\leq 3/8$ Cloud cover
<2	A	A-B	B			
2-3	A-B	B	C		E	F
3-5	B	B-C	C		D	E
5-6	C	C-D	D		D	D
>6	C	D	D		D	D

SOURCE: Pasquill, 1961.

Note: Types a, b, and c are associated with strong, moderate, and slight instability, respectively; type d corresponds to a neutral lapse and should be assumed for overcast conditions during day or night; and types e and f are associated with slight and moderate inversions, respectively.

each stability class corresponding to the six classes defined by Pasquill (1961). The surface roughness is also considered. It is expected that this parameterization is more appropriate than the Pasquill values for distances between 1 and 50 km. The horizontal dispersion coefficient, σ_y (m), for rural conditions is calculated for the downwind distance, x (m), using the formula

$$\sigma_y = \alpha \times (1 + 0.0001x)^{0.5} \tag{II-4}$$

The vertical dispersion coefficient, σ_z (m), for rural conditions is calculated using the formula

$$\sigma_z = p \times (1 + qx)^f \tag{II-5}$$

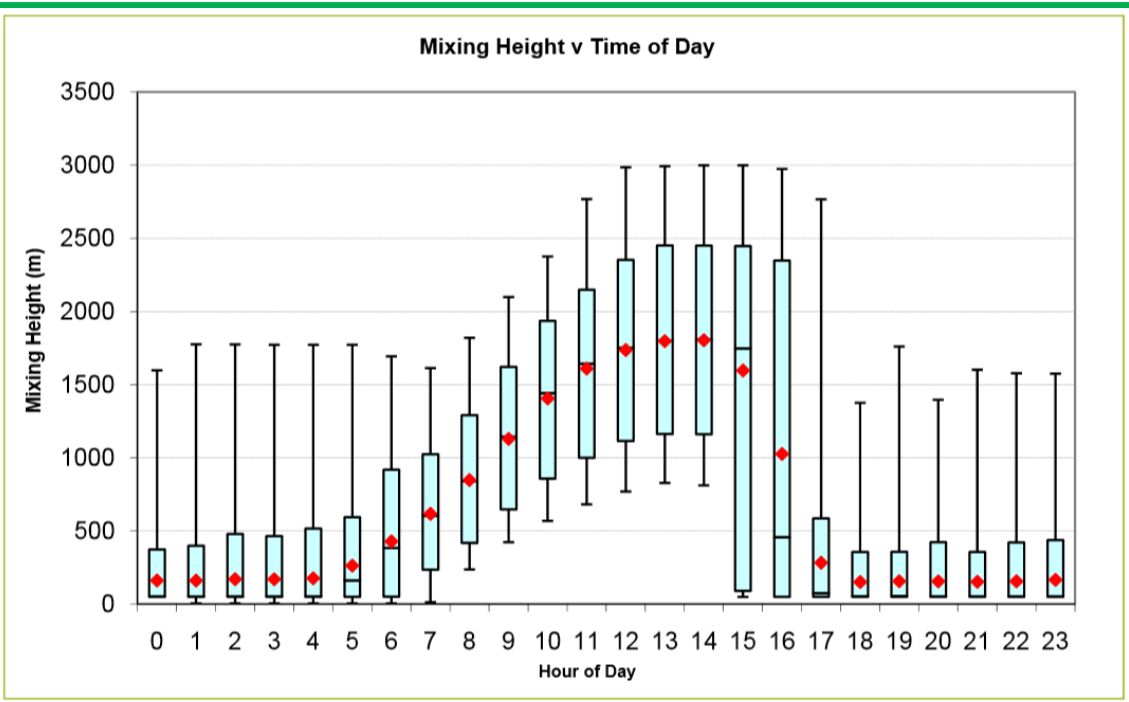
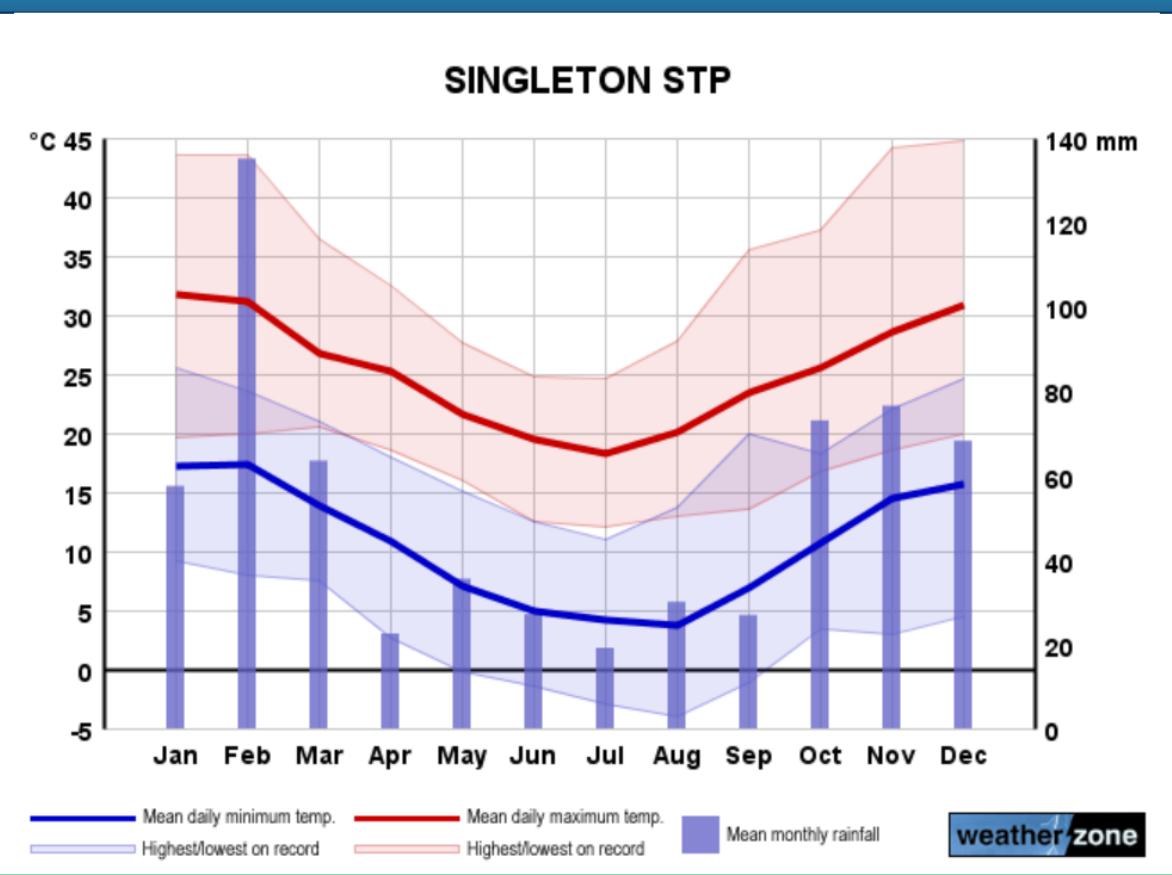


Figure 5.5: Mixing Height by Hour of the Day (generated by CALMET)

Maules Creek PAE Holmes 2011

Singleton Annual Temperatures & Rainfall



2002 to 2017 Records

Table 7 provides an abbreviated summary of stack test results for select pollutants, reviewed for the period 2011-2016. A full summary table of results is included in section 3 of Attachment C.

Table 7: Maximum and average reported results of air pollutants from stack sampling reports (2011-2016)

		Solid Particles (Total) (mg/m ³)	Total Fluoride (mg/m ³)	Sulfuric Acid Mist (H ₂ SO ₄ as SO ₃) (mg/m ³)	Mercury (mg/m ³)	NOx (as Equivalent NO ₂) (mg/m ³)	Hydrogen Chloride (mg/m ³)	Chlorine (mg/m ³)
Bayswater	Licence Limit	<i>100</i>	<i>50</i>	<i>100</i>	<i>1</i>	<i>1500</i>	<i>100</i>	<i>200</i>
	Average	15	13	13	0.0014	659	13	19
	Max	68	54	55	0.0053	940	24	200
Liddell	Licence Limit	<i>100</i>	<i>50</i>	<i>100</i>	<i>1</i>	<i>1500</i>	<i>100</i>	<i>200</i>
	Average	24	11	9	0.0004	724	14	0.04
	Max	58	17	58	0.0015	930	28	0.20
Mount Piper	Licence Limit	<i>50</i>	<i>50</i>	<i>100</i>	<i>0.2</i>	<i>1500</i>	<i>100</i>	<i>200</i>
	Average	11	6	21	0.0010	767	1	1.3
	Max	39	11	120	0.0019	1200	2	13
Eraring	Licence Limit	<i>50</i>	<i>50</i>	<i>100</i>	<i>0.2</i>	<i>1100</i>	<i>100</i>	<i>200</i>
	Average	9	10	11	0.0010	415	4	0.40
	Max	19	32	68	0.0022	593	13	1.8
Vales Point	Licence Limit	<i>100</i>	<i>50</i>	<i>100</i>	<i>1</i>	<i>1500</i>	<i>100</i>	<i>200</i>
	Average	2	3	15	0.0012	881	4	1.1
	Max	7	12	42	0.0078	1099	8	3.8

Notes:

- Cells in bold text exceeded the EPL concentration limit.
- Emission limits in italics.

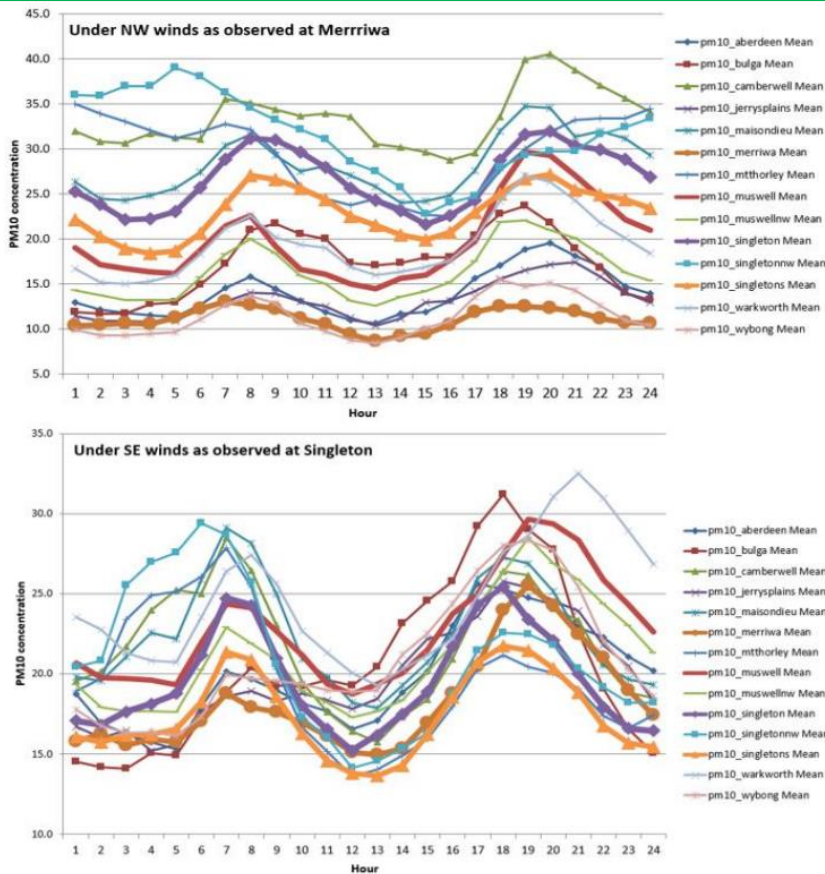


Figure 25: Diurnal variations of PM₁₀ concentrations by site under NW and SE wind conditions. The curves for Singleton, Singleton South (singletons), Muswellbrook (muswell) and Merriwa are highlighted with thicker lines

NSW OEH Report Aug 2017 ISBN 978-1

Real Time Air Quality Triggers

This section refers to Real Time air quality trigger levels. The real time air quality monitors have been setup to record directional dust sources. Alarms have been set up to trigger when one of the following criteria is exceeded. The criteria are summarised below:

- Yellow Dust Alarm
 - Short Term Trigger is a site specific contribution 30 mins rolling average greater than 80 µg/m³;
 - Long Term Trigger is a site specific contribution 24-h rolling average greater than 40 µg/m³;
- Orange Dust Alarm
 - Short Term Trigger is a site specific contribution 1-h rolling average greater than 80 µg/m³; or
 - Long Term Trigger is a site specific contribution 24-h rolling average greater than 45 µg/m³.
- Red Dust Alarm
 - Short Term Trigger is a site specific contribution 1-h rolling average greater than 200 µg/m³; or
 - Long Term Trigger is a site specific contribution 24-h rolling average greater than 50 µg/m³.

Singleton Shire Healthy Environment Group

“10 Ten Year Review of Air Pollution Action ?”



Singleton Shire Healthy
Environment Group
PO Box 626 Singleton
NSW 2330

*A community-based group looking to address Environmental
issues affecting Singleton Shire residents*

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

We seek identification as to what is making our Children and
Community Sick so they can be mitigated by OH&S Compliance Orders.

SSHEG Focus on Health

SSHEG is Not Anti Mining or Anti Power Stations

“Circular to SSHEG Members to prepare 10 Year Review”

In view of the ongoing daily Air Pollution issues in the Hunter Valley, especially now around Camberwell, Maison Dieu, Bulga, Jerrys Plains and Singleton Town; it is appropriate that a 10 Year Review of the efforts of SSHEG Members is prepared to be reported back to the Singleton Community.

It would be most appropriate for SSHEG members to present a summary position of our successes and disappointments regarding at least the following; -

1. Is NSW Health being listened too?
2. Is EPA Air Pollution effort disbanded with Buffier leaving?
3. Have Mining Dialogue listened, or simply give us platitudes, while whiteanting our efforts?
4. Have Experts simply seen SSHEG issues as a means to more research funding of their pet projects and research approaches, and unwilling to change their approach?
5. Has the Powers that Be simply listened, done little and hope we all loose interest and go away?

A chronological outline of SSHEG Topics follows.

Outline for a 10 Year Review of SSHEG Initiatives to address the Upper Hunter Valley Poor Air Quality and the associated Resident's Disease Impacts!

Topics:-

- **2005** NSW Health Position as advised by Governments to Mining and Community – *“No convincing evidence of any association between Mining and Community Diseases”*.
- **2007** Singleton Doctors expose association of Residents Diseases and Air Pollution.
- **2008** Community Votes to Investigate forming SSHEG beginning Resident Disease Survey.
- **2009** Nov SSHEG submits Report to NSW Government seeking Health Study.
- **2010 Mar** ABC Four Corners TV exposes inaction Premier Keneally appoints Chief Health Officer and Expert Panel.
- **2010+** Extent of Expert Panel Investigations, deliberations, undertakings & Reports? Dialogue with SSHEG members begins June 2010.
- **2010+** Role, Effect & Effectiveness of UNAQMN.
- **2012 June** WHO - Diesel Exhaust Carcinogens.
- **2013 Mar** SSHEG Senate Submissions *“The Impact on Health of Air Quality in Australia”*.
8 Topics outlined by SSHEG Members to address. Supplement *“Diesel Exhaust & Particle Toxicity.*

What impact and responses?

- **2013 Sept Air Pollution & Health Workshops & Symposia, CAR Sydney & Newcastle Forum.**
The events involved discussions and presentations from three international experts in the field - Prof C. Arden Pope, Prof Bert Brunekreef and Prof Ross Anderson, and brought government, academia, community and industry representatives together to discuss the issues related to air pollution, and to hear the latest information on the health evidence regarding the effects of air pollution.
- **2013 Oct WHO & Lancet Air Pollution & Disease Risk “Game Changer” SSHEG Health fears are confirmed.**
“No Safe Limit of Pollution Exposure on a Linear Relationship”
“Air Pollution and Particulate Matter” as well as “Diesel Exhausts” are classified as “Group 1 Carcinogens”
- same as Asbestosis, Arsenic and Mustard Gas, and on the same order of magnitude as passive Smoking.
- **2014 Mar SSHEG Health Study Progress Report “Near Neighbours and Farmers” to “Open Cut Mining” must be protected the same way “Underground Miners” are protected from Mining Pollution by Mining Compliance Orders.**
Three aspects have shaped the 2014 SSHEG Action Plans to reinstate at least in part this imbalance.
 - (1) *Air Pollution Exposure Protection Plan for “Near Neighbours and Farming Families and Residents” in close proximity to Open Cut Mining.*
 - (2) *Ramifications of WHO October 2013 announcements confirming “Air Pollution and Particulate Matter” have serious Human Disease impacts. (especially June 2012 Diesel Exhaust)*
 - (3) *Earlier in 2011, NSW Expert Advisory Committee confirmed the “Hospitalisation Risk” of Toxic Mine Blasting Plumes that drift at ground level outside Mine Lease Land.*
”Elimination of Mine Blasting into the Air with better stemming”.

- **2014 Dec** SSHEG 20 Page Poster for Mining Dialogue “What’s in the Air we Breath”- 6 Priority Actions.
- **2015 May** SSHEG Review of “*Hunter Valley Mining Dialogue 2011 -2015*”.

This Tabular Review Summary below examines the degree to which the four years of the Mining Dialogue have addressed SSHEG concerns.(**Appendix M1** SSHEG Mitigation Priority Actions List)

Focus is on Mining Pollution Mitigation Priority Action		
SSHEG PRIORITIES		v/s MINING DIALOGUE PRIORITIES
No	SSHEG 2013 Review Top 10 Priority List	Mining Dialogue 2011 Workshop Emission & Health
1	<p>“Independent Health Study” Nov 2009 SSHEG Submission - NSW Gov.</p> <p>2011 Nelson# Speciation & Morphology Oct 2013 WHO Carcinogen Classifications Air Pollution, Particulates, Diesel Exhausts</p>	<p>2011 Health Risk Assessment@ location & during Exploration Assessments (Held 2011)</p> <p>2010 NSW Planning Compliance Officers & Experts</p> <p>2013 NSW Environmental Health Reports released</p> <p>2013 Mine Health Impact Consultancy (Gloucester)</p> <p>2013 Particle Characterisation Study PM2.5 Air Quality Speciation (Held 2012)</p>
2	<p>2009 “Elimination of Mine Blasting Plumes into atmosphere” Dust, Fumes, Drifting Toxic Hot Gas Bubbles returning to Ground</p>	<p>2011 NSW Health Expert Panel confirmed Toxicity (21 SE Qld Miners Hospitalised Kms away)</p> <p>2012 NSW Planning Best Practice (Colour) Blasting</p> <p>2015 NSW EPA Blast Fume Licence additions</p>
3	<p>2012 “Near Neighbours as Mine Occupationally Exposed” Underground Mine Air Quality Standards</p>	<p>2011 UHAQMN & DUST STOP Programs & Audits</p> <p>2013 MID Weather Forecasting</p> <p>2015 NSW EPA Bad Days Analysis KPI’s</p>
4	<p>2014 “Diesel Exhaust Pathways” Isodose Zones around Mines</p>	<p>2014 Mining Dialog Train Wagon Pollution Review</p> <p>2014 NSW EPA Newcastle Train Wagon Dust Study</p>
5	<p>2010 Biological Asthma Susceptibility & “Allergen Calendar”</p>	
6	<p>2009 “Coal Fired Power Stations Stack Plume Gases targeting Toxic Fly Ash”</p>	<p>2012 NO2 & SO2 Monitoring added to UHAQMN</p> <p>2014 Rainwater Lead in Tanks MID Study</p>
7	<p>2009 “Mining Noise Health Implications” Residents Night Sleep Disturbance</p>	<p>2014 “CAR” Epidemiology Noise Disease Identified relates to Sleep Disturbances</p>
8	<p>2009 Air Quality Human Disease Risk Guidance(Averaging Issue)</p>	<p>1998 NEPM PM10 Standards @> 25,000 Population</p> <p>2015 Draft NEPM PM10 & PM2.5</p>
9	<p>2009 Hunter River Irrigation Water</p>	<p>1995 Salinity Trading Scheme</p> <p>2012 MID Water Accounting Framework Studies</p>
10	<p>2009 Surface Land Rights against Mining</p>	<p>2011 MID Synoptic Land Use Plan</p> <p>2015 NSW Planning Coexistence Debate</p> <p>Refer Appendix 1 SSHEG Priority List 2014</p>

Green NSW EPA & DPE Actions: RED Mining Dialogue Action: BLUE NSW Health:

- **2016 June** SSHEG Bulga Culture Centre – Ancestral Heritage in Hunter Valley, Sense of Place Health, Aboriginal, Colonial & Convict Cultural Heritage.
- **2017 Jan** SSHEG – EPA Clean Air NSW Consultation 2017
- **2018 June** What has NSW Health, EPA, OEH, Planning and PAC (now IPC) done in response to Clean Air Consultation 2017????

SUMMARY Note

It is my intention to email to the SSHEG members to get their thoughts, comments, highlights, contributions and any suggestions for the preparation of this 10 Year SSHEG report.

Once prepared this would be then circulated to SSHEG Members for final comment, corrections etc and then my intention is to issue it first to NSW Chief Health Officer (Dr Chant) and David Durkheim before circulation it etc.

SSHEG Replies by end of August 2018 would be appreciated for a Draft 10 Year Report envisaged by November 2018; again for SSHEG members comments before issue.

Thanking you in anticipation and Trusting this is satisfactory.

[REDACTED]

SSHEG

SINGLETON **S**HIRE **H**EALTHY **E**NVIRONMENT **G**ROUP

“The impact on Health of Air Quality in Australia”



A community-based group looking to address environmental issues affecting Singleton Shire residents

SSHEG is Not Anti Mining or Anti Power Stations, we seek identification of What is making our Children and Community Sick so they can be mitigated by OH&S Compliance Orders.

SSHEG Focus On Health

Senate Committee Submission March 2013

Submission Summary covering letter

“The Impact on Health of Air Quality in Australia”

This Senate Submission generally relies upon SSHEG documents prepared since 2008 that capture the extent of the Pollution Issues unearthed by the Singleton Shire Community. Eight Topic areas are outlined below together with the SSHEG Member contribution and the List of Reference Documents which form part of this submission. *Separate to this Senate Submission, individual SSHEG members are expected to also further detail Air Quality Community Health issues.*

Five Years after the Community attended a Public Meeting at Singleton in 2008 concerned at the Sickness in the Community associated with the quickening pace of Open Cut Mining, the perception remains that our Health concerns are not being addressed or understood.

There are no effective Pollution Standards with regards Residents Health.

Year by Year Pollution levels rise.

There remains no acceptable Solution or Pollution Mitigation plans.

Focus remains on Dust Pollution, not Plume Gases, Vapours & Noise.

Best Practice Environment Control is a Word not an Action.

The “Hunter Valley Cocktail of Pollutant Exposure Concentrations of Near Neighbours” being closest to Combustion related Industrial Processes, is what sets this apart from the Beijing, London extreme “Urban Smog” Events; and classifies these Pollution Cocktails as similar to Wyoming Valley and Cincinnati Air Quality Experiences.

“While mineworkers enjoyed Occupational Health protection, Near Neighbours, Farmers, Villages, and the town Communities nearby have no such protection from Open Cut Mines with Pollutant emissions well outside their Mining Leases”

Near Neighbours, families, children, Farmers working outdoors and unprotected by air conditioning enclosures like Miners are all “Occupationally Exposed Persons to Coal Mining Airborne Dust”, and Mine OH&S compliance should apply..

The “Pseudo Ventillation Standard of underground Coal Mines” would be suited to apply to all of the “Near Neighbour and farm workplace situations”.

*“The exposure Standard for Atmosphere Contaminants in the Occupational Environment * is:-*

(a) Time Weighted Average (TWA) 50 micro g/m³.

(b) Short Term Exposure Limit (STEL)

*15 minutes TWA exposure
and not more than 4 times a day
and at least 60 minutes apart.”*

**These limits have a Data set reference relating to Underground Mine Ventillation Standards where adequate ventillation flow to areas where people travel or work are a minimum velocity of 0.3 m/sec”.*

A strong argument therefore exists to base PM measurements on 15 Minute Averages to gain the advantage of existing Miner Exposure Standards, and Mine OH&S Regulations.

The use of PM Monitors since 2006 in the Hunter Valley has seen:-

”Realtime PM10 Monitors that report only as 24 Hour Average PM10 Monitors”.

The insistence by “Environmental Authorities” to maintain this restriction has allowed the farcical situation of “Data Averaging” to flourish throughout Operating Industries in NSW, while Residents are exposed to Extremes of Industry generated Dust, Fumes and Vapours for short periods of the Day with Industry impunity.

SSHEG consider that “Averaging” is the “Key Issue” used by those who should know better to disguise “Dangerous to Health Environmental Pollution” from being recognized and thus eliminated.

Whats in the Air Pollution Cocktail ?

Notable among these Pollutants are Sulfur Dioxide(Sox) and Nitrogen Dioxide (NOx) Gases for Asthmatics, Chromium VI, Arsenic, Lead and Mercury from Power Station Fly Ash entering Rainwater Tank Drinking Water, while Combustion formed Dioxin and Ozone and Aerosol formation from Sunlight action on the polluted Air, along with many others were not mentioned, but remain a concern today.

The Coal Mining juggernaut rolls on unchecked, creating unbearable “Dust, Fumes, Plumes, Fly Ash, Combustion Gases, Diesel Exhaust Pollution, Vapours, Incessant Mine Noise and Trains rattling through Homes beside Houses, Ground Vibrations, Glaring lights, Sleep disturbances, Psychological Pressure, Irrigation Creek Water unfit for cropping, squeezing out Near Neighbours and Villages, while encircled Villages and “plundered Communities and Prime Agricultural Land”.

The long road to recognition that Passive Cigarette Smoking is a Death Health Hazard is now being surpassed by a far greater Population Health Risk by the Failure of Governments to Act on Air Pollution Hazards.

“SSHEG contend that all Major Projects, especially Mining and Power Station Operations, both Existing and Proposed should be subject to Cumulative Health Studies and Health Risk Assessments in order to restore the balance between Employment and Financial Revenue on one hand, and Community Health on the other hand”.

It should also be remembered in Cumulative Assessments to address the Health Issues, that 50% of the Singleton Community concern relates to Asthma, particularly in Children.

The Residents who have been forced to endure living beside Power Stations built without the Community Buffer Zones of the past, have their Health compromised, while Environmental Pollution Controls and Regulations seem solely focuses on protecting only the communities in Major Towns such as Singleton and Muswellbrook.

Finally, it is clear that new Health Research Methods need to be developed to provide perhaps a Real Time Technological basis which will overcome the current Medical Impasse where small Community samples exclude them from Health Studies.

Submitted by the Singleton Shire Healthy Environment Group 5th March

SINGLETON **S**HIRE **H**EALTHY **E**NVIRONMENT **G**ROUP

“The impact on Health of Air Quality in Australia”



A community-based group looking to address environmental issues affecting Singleton Shire residents

SSHEG is Not Anti Mining or Anti Power Stations, we seek identification of What is making our Children and Community Sick so they can be mitigated by OH&S Compliance Orders.

SSHEG Focus On Health

Senate Committee Submission March 2013

Submission Summary

“The Impact on Health of Air Quality in Australia”

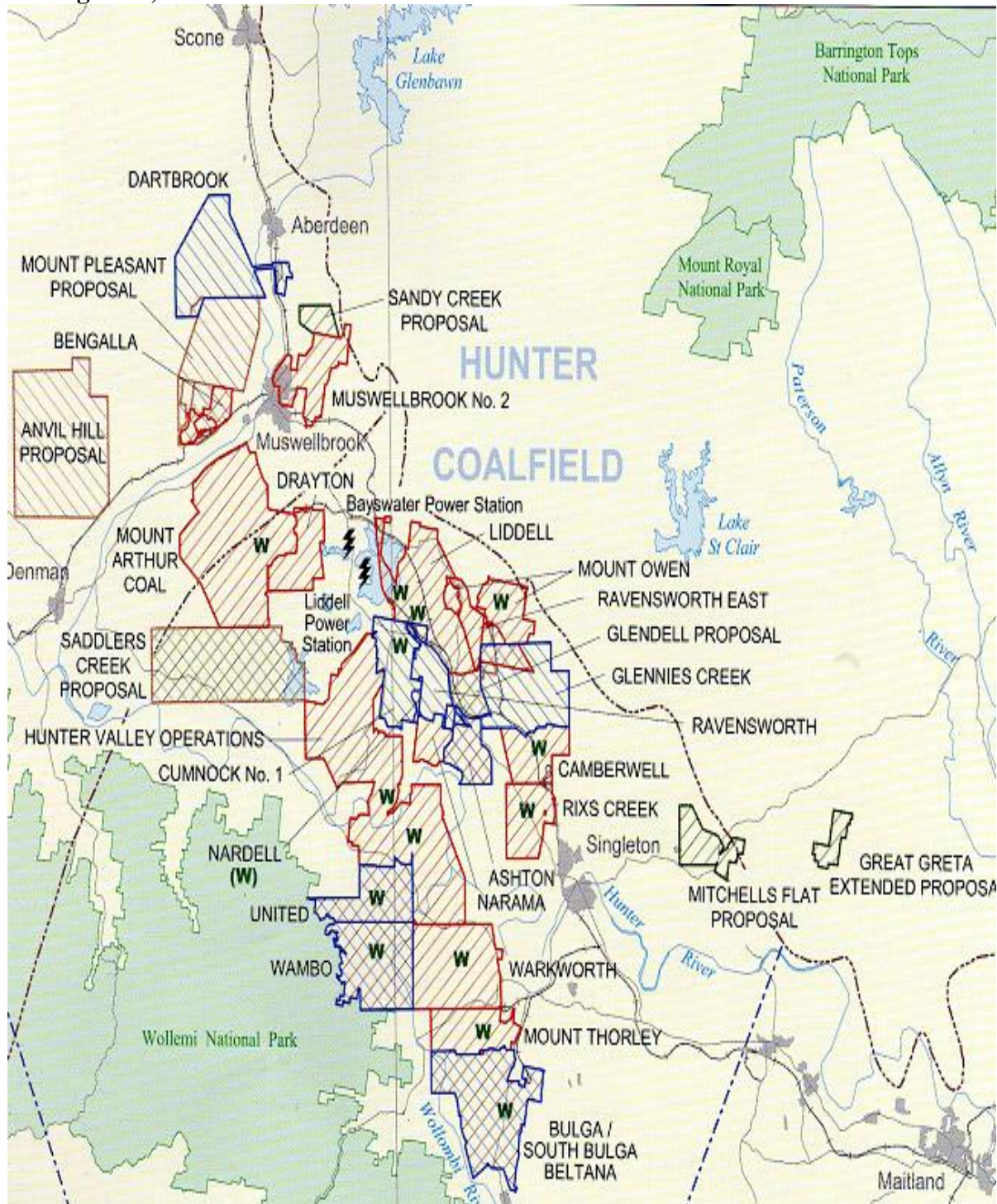
Singleton Shire Healthy Environment Group (SSHEG) arose in 2008 out of Singleton’s Doctor Au’s Hunter Valley Air Quality concerns were unheeded by Authorities, and posed the question “What is making our Children and Community Sick?” Especially, Respiratory Illnesses and Asthma.

Subsequently, from Community Surveys SSHEG advised NSW Health of 45 Health issues in (*Attachment S1*) that are prominent in Singleton Shire Towns, Rural Villages, Hamlets and Farming Communities.

This Senate Submission generally relies upon SSHEG documents prepared since 2008 that capture the extent of the Pollution Issues unearthed by the Singleton Shire Community. Eight Topic areas are outlined below together with the SSHEG Member contribution and the List of Reference Documents which form part of this submission. *Separate to this Senate Submission, individual SSHEG members are expected to also further detail Air Quality Community Health issues.*

The SSHEG Community Health Survey and Pollution Investigations 2008-9 identified Coal Mining and Coal Fired Power Stations and related Industries as the Major Pollution Emitters, and this led to our Submission to NSW Government on 7th November 2009 (*Attachment S2 where 37 Pollutants were identified*) calling for “An Independent Health Study in the Hunter Valley”.

The extent of the Government's disregard for Hunter Valley Residents can be appreciated by the extent to which Farming Communities, Localities, Villages, and Towns are engulfed now by 3 Coal Fired Power Stations and upwards to 35 Mining Sites; as shown below:-



Map 1: Location of coal mines and power stations in the Singleton-Muswellbrook area.



Plate 1: An aerial view of Hunter valley coal mines (Greens NSW, 2005)

Three positive Government and Industry responses to the 2009 SSHEG Submission were:-

- (1) NSW Chief Health Officer and Expert Panel study from 2010 with Major Towns Study expected earliest March 2013.**
- (2) Three NSW Department. of Planning Compliance Officers at Singleton in 2010. We note periods of Air Quality improvement since.**
- (3) Upper Hunter Air Quality Monitoring Network ** now operates at 14 Sites since January 2012. Pollution SMS Messaging NBG.**
- (4) Government response are outlined in *Attachment S20*.**

It should be noted ** that Individual Open Cut Coal Mines across the Hunter Valley from 2006 onwards provided 24Hr continuous Particulate Matter PM10 Realtime Monitors at around 76 locations (Attachment S15). These Monitors are mostly under utilised for reducing Dust and Pollution Emissions.

Each Industry with Environment licenses monitor operations and emissions and submit an Annual Environment Management Report, detailing monitoring readings, Community Complaints, Environmental Incidents and Reports, and Licence compliance details.

Miner's Dust; How acceptable is Figure 15 ?

Katestone Environmental Pty Ltd KE 1006953 OEH June 2011

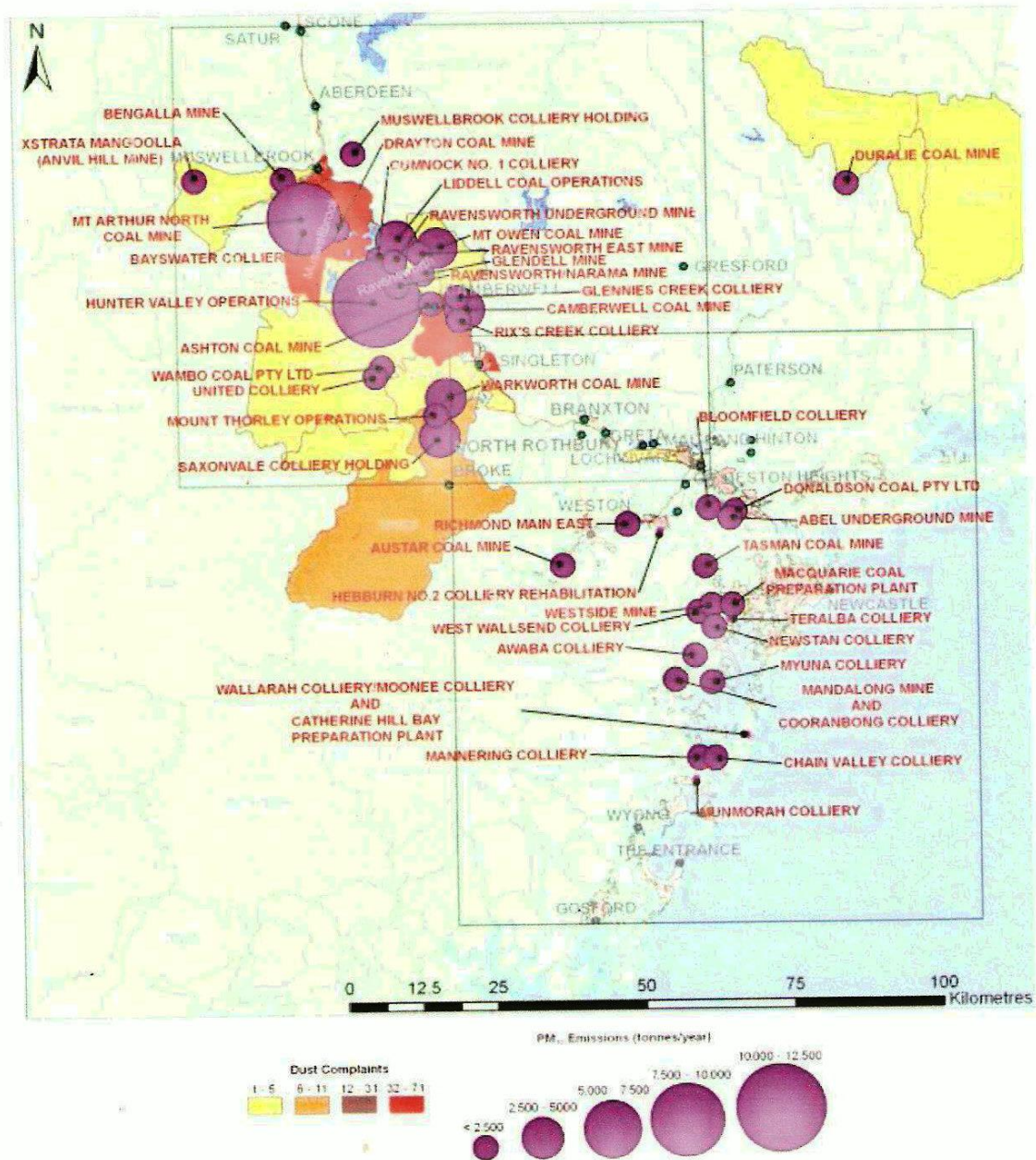


Figure 15 Complaints about dust in the Newcastle and Hunter Coalfields by suburb and relative coal mining emission rates of PM₁₀, 2007-2009

Three SSHEG “Historians” have from these early days highlighting to Government Departments, EPA and Health Authorities the Coal Industries Impact in the Hunter Valley (*Attachment S3*); where the Prime Agricultural area of the 1960’s was transformed with Coal Fired Power Stations near Muswellbrook supplying cheap Electricity for two Aluminium Smelters (Kurri Kurri and Tomago); and now the somewhat out of control Open Cut Coal Mining “Moonscape” between Singleton and Muswellbrook as just the beginning.

In the process the Coal Mining juggernaut rolls on unchecked, creating unbearable “Dust, Fumes, Plumes, Fly Ash, Combustion Gases, Diesel Exhaust Pollution, Incessant Mine Noise and Trains rattling through beside Houses, Ground Vibrations, Glaring lights, Sleep disturbances, Psychological Pressure, Irrigation Creek Water unfit for cropping, squeezing out Near Neighbours and Villages, encircled Villages and “plundered Communities and Prime Agricultural Land”.

What then has SSHEG identified what is Needed ?

- (1) Independent to Government Accumulative Health Risk Assessments on all Non Agricultural Industrial Developments based on the heightened Health changes to “Near Neighbours” and Resident’s in weekly assessments, from one hour (1Hr running Average) Accumulative Environment Pollution Emission Exposures.
- (2) SSHEG calling in 2009 for Independent Health Study to identify Accumulative Air Quality Pollutants Impact on Hunter Valley Residents, with a view to Mitigation or Cessation at the Pollution Emission Sources.
- (3) OH&S Act Protection of “Near Neighbours” as “Occupationally Exposed” incorporated in Mining and Power Station Industries.
- (4) Power Stations to cease acting as “High temperature Incinerators” for Solid and Liquid Toxic Waste substances.
- (5) Realtime Gaseous and Particulate 24hr Monitoring, Staged Alarming and Pollution Reduction Control of all Industrial Process Pollution Emissions to Atmosphere, especially Combustion related Processes.
- (6) Establish Particulate Matter (PM) Measurement (ug/m³) for Pollution Reduction Control to be based upon One Hour Running Averages, for PM₁₀ and PM_{2.5}, with PM₄ for Near Neighbours and Residents, PM₁, and PM_{0.1} for Medical Research Health Assessment purposes.
- (7) 6 Monthly Routine Testing and Accreditation of Rainwater Tanks used for Drinking and Residents Cooking, due to the heavy overnight Aerosol fallout on Rural Homes that fall within the “Designated Near Neighbours Industry Buffer Zone; and undertaken at Industry cost.
- (8) Establish Locality based Medical Record Profiles noting Community Pollution Events exposures in preceding days based on 1Hr Rolling Average PM Pollution criteria.
- (9) Fifteen Interim Health related Actions are outlined in letter to Chief health Officer dated 4th Nov 2010 in *Attachment S10* Page1-4.

SSHEG Senate Topics for Hunter Valley Health Issues

This Senate Submission generally relies upon SSHEG documents, Reports and Presentations prepared since 2008 that capture the extent of the Pollution Issues unearthed in the Singleton Shire Community. Eight Topics are outlined in this written submission with SSHEG Members identified should the Senate Committee prefer to have presentations (preferable in the Hunter) on key aspects outlined. *Some individual SSHEG members have also made additional submissions.*

The SSHEG Community Health Survey and Pollution Investigations 2008-9 identified Coal Mining and Coal Fired Power Stations and related Industries as the Major Pollution Emitters, and this led to the SSHEG Submission to NSW Government on 11th November 2009 (*Attachment S2*)

Senate Submission Topic Details :-

TOPIC 1 *Member Dr John Drinan PhD*
Narrated

SSHEG Submission to NSW Government 11 Nov 2009 is an urgent call for an Independent Scientific Study for Singleton Shire Residents; to:-

- 1. ascertain the health status of the residents of Singleton Shire relative to State averages and other relevant comparators;*
- 2. identify and quantify health risks associated with air and rural rainwater quality;*
- 3. provide real-time, independent monitoring of industrial emissions in the air of Singleton Shire, with composite analysis, and easy public access to the information it generates, and a transparent mechanism for redressing any risks that are identified;*
- 4. investigate the relationship between industrial emissions in the Singleton Shire and the health of the residents;*
- 5. monitor and report pollutant loads in water tanks, especially in rural areas of the Shire that are dependent on rainwater for all purposes.*

The SSHEG Submission to the NSW Health Minister confirmed the presence of large volumes of complex Gases and Particulates discharged into the Hunter Valley Atmosphere by daily Industrial activity, with the SSHEG Submission identifying 37 Pollutants (Attachment S2 Appendix 3 Table) considered by current regulatory authorities likely to be of a Health concern while many others may have gone unnoticed.

Notable among these Pollutants are Sulfur Dioxide and Nitrogen Dioxide for Asthmatics, Chromium VI, Arsenic, Lead and Mercury from Power Station Fly Ash for Rainwater Tank Drinking Water, while Combustion formed Dioxin and Ozone and Aerosol formation from Sunlight action on the polluted Air along with many others were not mentioned, but remain a concern today.

Residents' perceptions of the impact of air quality on their health in the Singleton Shire reinforces what the Singleton GP, Dr Au has been reporting. Higginbotham et al 2006 Survey findings Attachment S19 before the quickening pace of Open Cut Coal Mining by 2008-9. This was reinforced by the SSHEG Community Health Survey (Attachment S4) which focused on Residents Health, Diseases Testimonials and identifies Resident's Home location throughout the Singleton Rural Shire.

Pathological effects of the Major Pollutants identified in the Hunter Valley are based on National Pollution Inventory; as a slide from SSHEG presentation:-

Pollutant	Effects on human health when dispersed in air	NPI Health Hazard Rating*
Sulphur dioxide	Irritation of eyes, nose, throat, choking, coughing; headache; general discomfort and anxiety. People with impaired heart or lung function and asthmatics are at increased risk. Inflammation of respiratory tract, wheezing and lung damage. Harmful to reproductive systems of experimental animals and causes developmental changes in their newborn.	1.5
Nitrogen oxides	Irritation of eyes, nose, throat and lungs, shortness of breath, tiredness & nausea. Nitric oxide and nitrogen dioxide most toxic.	1.5
Particulate matter	There is no threshold at which toxic effects do not occur. These include toxic effects caused by absorption into the blood, e.g. lead, cadmium; allergic or hypersensitivity effects; fibrosis; cancer; irritation of mucosae; increased respiratory symptoms, aggravated asthma, & premature death (risks highest in young children & elderly).	1.2

The February 2013 Overhead Presentation of SSHEG concerns at Jerrys Plains where around 100 attended explains the Top Sources of Pollution in the Hunter Valley from Power Stations and Coal Mining. (Refer Attachment S18)

The Major Pollutants being Sulfur Dioxide, Nitrogen Oxides, Particulate Matter PM10 including PM2.5, with list of Toxic substances, Chromium (VI), Mercury, Lead, Arsenic, Benzene, Florides, Zinc, Cyanide etc.

During 2012 The Upper Hunter Air Quality Monitoring Network (UHAQMN) reported PM10 Statistics at 14 locations based on 24Hr Averages, recording only 6 days of exceedance above 50ug/m3, with the highest daily average on 6th September 2012 at 63.6 ug/m3. *“It is inconvenient to admit that behind these daily averages there are hundreds of hourly exceedances”.*

SSHEG considers that in the Singleton Shire it is the outlying Villages and the Near Neighbours beside Open Cut Mines and Power Stations that have the most health Risk from Pollutants at their Emission Sources. The High concentrations of Hunter Valley Combustion Gases, Vapours and Particulate Pollutants, certainly above 50ug/m3 as PM10’s at even one Hour’s concentrations is considered damaging to a person’s Health as attested to by many Residents in these Localities.

The UHAQMN confirms that extremely High PM10 Pollution Levels exist for many Hours of individual days above 50ug/m3, as well as consecutive days; i.e on 6th Sept. 2012 Singleton Township recorded 15 plus 5 missing readings over 50 up to 97.1 for 1Hr Avg values, while the out of Town Singleton Shire areas, - Maison Dieu 12 up to 87.3, Mt Thorley Industrial Estate 19 up to 100.0, and Camberwell 18 up to 136.7 ug/m3 for 1 Hr Avg. Singleton on that day experienced around 20 out of 24 Hours above 50ug/m3 as most probably the Highest readings are missing when the Monitoring equipment was chocked with “Pollution Dust”.

More importantly, the Shire Residents who are beside Mining and Power Station Operations are closest to the Pollution Sources of Emission, and are exposed to a more concentrated Cocktail of Pollutants than those in the Town Centers.

The “Hunter Valley Cocktail of Pollutant Exposure Concentrations of Near Neighbours” closest to Combustion related Industrial Processes, is what sets this apart from the Beijing, London extreme “Urban Smog” Events; and classifies these Pollution Cocktails as similar to Wyoming Valley and Cincinnati Air Quality Experiences.

The use of PM Monitors since 2006 in the Hunter Valley has seen *“Realtime PM10 Monitors that report only as 24 Hour Average PM10 Monitors”*. The insistence by “Environmental Authorities” to maintain this restriction has allowed the farcical situation of “Data Averaging” to flourish throughout Operating Industries in NSW, while Residents are exposed to Extremes of Industry generated Dust, Fumes and Vapours for short periods of the Day with impunity.

TOPIC 2 *Member Dr Tuan Au - Singleton GP Narrated*
A separate Senate Submission will be made by Dr Au.

The Singleton Shire Community observed the connection between Air Quality, Dust from mining and debilitating sicknesses requiring Hospital and Doctors Visits. Community concerns were ignored. (ABC News reports)

Dr Tuan Au was instrumental in alerting NSW Health Authorities, but without support, testing of 900 local school children soon confirmed that one in six had a lower lung function compared to the national average for asthma of one in nine. (Attachment S5)

The response by the NSW Health Minister in 2010 to the SSHEG Submission was to dismiss the findings, noting that “ A Study of Asthma exacerbations requires the ability (of) measurement .. (of)... individuals exposures to pollutants on a daily basis”; and further, “Accurate Air Quality data is required, together with a methodologically rigorous Epidemiological Study” as reported by the 4 Corners ABC Channel TV Programme which was aired on 12th April 2010. (Attachment S6)

ABC NEWS

Coal town's doctors raise child health alarm

Four Corners Andrew Fowler
Updated Tue Apr 13, 2010 9:24am AEST

A GP living in the Upper Hunter Valley of New South Wales says if health problems caused by pollution from open cut mining are ignored "it's the same as murder".

People who live in Singleton and Muswellbrook and the towns in between have told Four Corners that the pollution coming out of nearby mines and power stations is making them sick with cancer and asthma.

Local GP Tuan Au tested 900 local school children and found one in six students had a lower lung function. The national average for asthma is one in nine.

His report was dismissed by New South Wales Health Minister Carmel Tebbutt.

Dr Au says that is not good enough and he has called for more to be done.

"What I'm going to do, is do it again until the Government will listen to it, and I will let the history be the judge," he said.

"If we ignore the problems and we do nothing about it's the same as murder."

Ms Tebbutt says Dr Au's work fails to "advance knowledge about the link between emissions in the Upper Hunter and asthma in children".

But another local doctor, Singleton GP Dr Craig Barry, has told Four Corners he is leaving the town because of fears for his children's health.

He says his family is moving because of "family lifestyle reasons" and "for my children's sake".

Dr Barry's children, who suffer from asthma, found their health improved dramatically while they were away from home on holidays.

Dr Barry's departure has added significance because he works in the same practice as Dr Au.

Dr Barry said, along with his wife, he had taken the decision after the family returned from a recent holiday to the coast.

"I find that when we go to the coast or out of the Hunter ... their symptoms seem to reduce down, not using their medication as much," he told Four Corners.

But he said a couple of days after returning home they had to get back on puffers and nasal sprays.

Dr Au said he was sad at Dr Barry's departure, but he understood that he was leaving because his children had asthma and eczema.

There are also fears about increased cancer rates in the town.



PHOTO: A coal stock pile at an open cut mine in the Hunter Valley. (Dean Lewins: AAP)

EXTERNAL LINK: Four Corners

INK: Four Corners

MAP: Singleton 2330

TOPIC 3 *Member Lyn Macbain – SSHEG Historian*
Narrated

SSHEG Community Surveys confirmed the variation and the extent of Sicknesses that were reported across the Shire; and particularly how multiple serious life threatening diseases were reporting in Rural Families and multiple Families in certain Localities. (Attachment S4)

Many personal case stories were collated as outlined on Attachment S3 indicating Health impacts on Asthma and Respiratory complaints, “Camberwell Cough”, Birth anomalies, unusual incident of rare diseases, Autism, Cancer etc.

Chief Health Officer of NSW requested further details to understand the extent of Community Concerns (Attachment S1). Our presence in Community Consultative Committees on Power Stations and Mining Operations provide first hand knowledge of the pitfalls in Approval Consent Conditions and Compliance Powers of Government agencies, and the inevitable deterioration leading to Pollution events.

Personal Testimonials of Sicknesses and family Health stories have been made available while others are personally known to SSGEG. (Attachment S8)

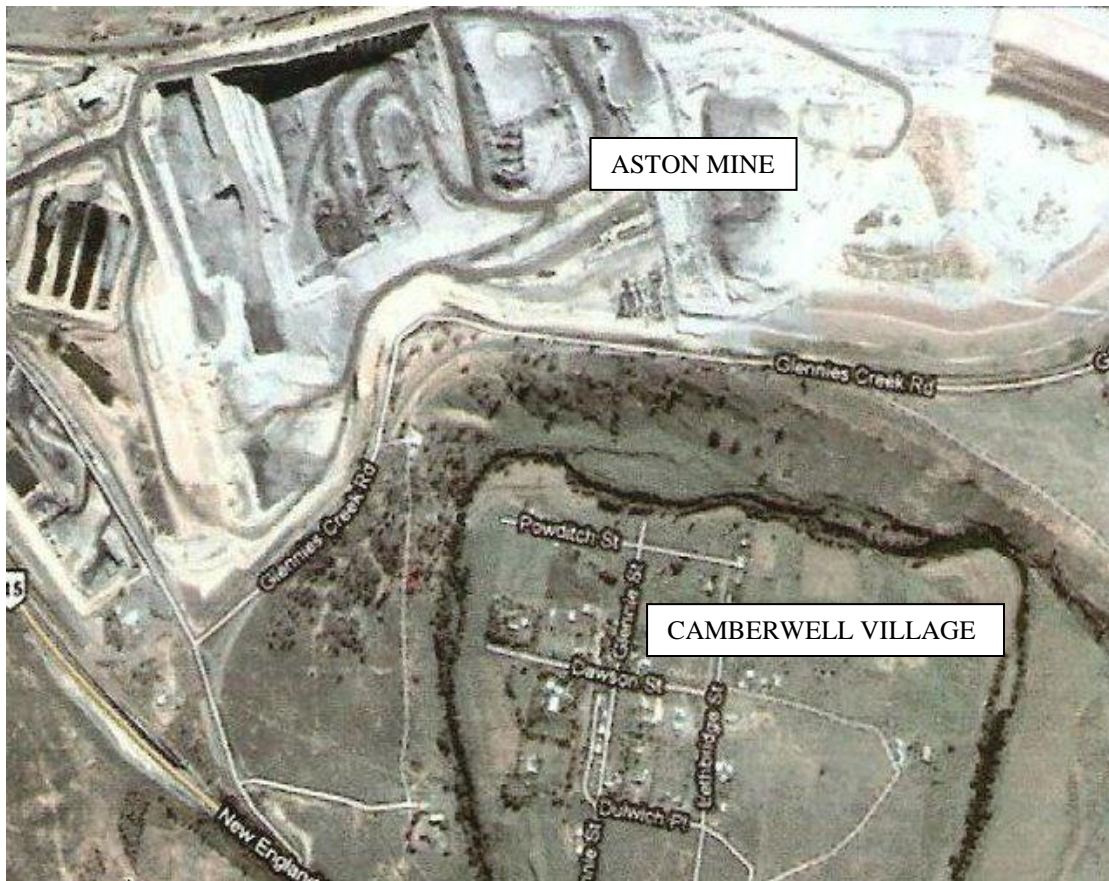
Over 20 years as a Community voice in Community Consultative Committees and an elected Councilor(Attachment S3), it appears the “Authorities consult with the Community on some occasions and are only going through the motions but the outcome seems predetermined from the outset”.

What the Community expects is a balance which protects the Health of Residents and especially Near Neighbours from Industrial Operations on one hand, while providing the Employment and Financial Revenue on the other hand.

TOPIC 4 *Member Deidre Olofsson – Camberwell Family*
Narrated

The lack of timely action by the NSW Government to the disgraceful Living condition in the Camberwell Village from Open Cut Coal Mining literally surrounding Residents, resulted in the SSHEG Document 2010 being prepared for the Chief Health Officer on 4th November 2010. (*Attachment S10*)

Not only is the Camberwell Village surrounded on all sides by Mining Dust bowls, Deep Voids and Dusty Stockpiles from five large mines; the “Authorities and Mining Companies” managed to get approval for the Aston Open Cut Coal Mine and Underground Mine Surface Stockpiles and Coal Washery which literally “engulfs” the Camberwell Village as shown below;-



Literally thousands of Health Complaints from Camberwell Residents have been ignored by the “Authorities’ and especially the EPA over the years some of which are logged in the Complaints Lists in *Attachment S10 A4 Page 78-82.*

The most serious Immediate Health Threat to Residents recorded is from Mine Blast Plumes which under some meteorological conditions instead of dissipating into the Atmosphere they stay as a Hot Gas bubble and drift especially to ground level near creeks and rivers. Refer Attachment S10 Section 1.0 page 9 and A2 page 73.



Photo 1 ***Camberwell Gassing Incident 2010 type viewing West***
*Mine Blast over the Ridge is sucked down to Glennies Creek
and drifts over Camberwell Residents in Bridge Street*

The “Near Neighbour” Residents are actually “Occupationally Exposed Persons” who are currently “ignored” by the “Authorities”, Government Acts, Regulations and Mine safety practices, and are left to their own resources in the event of a Health Incident such as that referred to as “The Camberwell Bridge St Gassing ”

Overall, Camberwell Residents have been subjected to Accumulative levels from Multiple Mine Sites of Blast Fumes, Dust Storms, incessant Noise and Ground Vibrations, operating Hours disregarded and the Families Medical Ecpenses and psychological uncertainty as to who to turn to for HELP!!

Much of which is outlined throughout Attachment S10.

TOPIC 5 *Member Di Gee – Dairy Farming Family*
Narrated

Three children born in the shadow of Open Cut Mines that operate ever closer to our Farming Hamlet. Why is it that the two older children born before we settled on the dairy Farm at Jerrys Plains do not have Asthma as our youngest three have? We relate Mining Pollution as the culprit.

For our third daughter, the medical complication of Asthma related breathing struggles and imminent malaise has not responded well to Medications; with periods of some months unable to attend school.

When an Orange Mine Blasting Plume drifted over the farm, our third daughter “ immediately started to experience headaches, a runny nose and watery eyes”; confirming our fears that it’s the Pollution that is affecting our children. (Attachment S9)

is also making it sick.

Asthma fears

We went to the Upper Hunter Valley on a stunning late autumn day with pristine blue skies. The only clouds came from dust billowing up from the mines.

After a few hours in the region, we started experiencing a metallic taste and a thin layer of grime inside our mouths. After a few hours spent filming very close to the open cast mines, there was also a slight irritation in our eyes.

Pollution is suspected of causing the problem. Last year, more than 100 tonnes of toxic metals, including arsenic, lead and cobalt, belched into the air from mines and power stations in the Upper Hunter Valley.

For the people who live here permanently, it is causing a major public health problem - or a public health crisis, to some.

In May, the government of New South Wales released a report on child health showing that nearly 40% of nine to 15-year olds in the Hunter Valley and New England region had suffered at some stage from asthma. That is 12% above the state average.

The study did not make a direct link between mining activity and the above average levels of asthma, but locals have drawn their own conclusions. They have been complaining for years about the health impact of the open cast mines in particular.

'Feel for her'

Take the experience of Courtney Gee, a schoolgirl who lives on a farm close to an open cast mine.

She suffers from asthma and has to take a concoction of drugs, including Ventolin and Seretide, which help her breathe. When the attacks come on, she says, it feels like breathing through a straw.

We were at the house when she returned from school and watched as she rushed, coughing and spluttering, to the medicine cabinet in the kitchen.

Her condition eases when she goes away on holiday, but became so bad last year that she missed three months of school.

Recently, a big orange cloud rose up from the local mine and drifted over the farm. She immediately started to experience headaches, a runny nose and watery eyes.


Her mum, Di Gee, started to well up as she described her daughter's condition.

"Sometimes you wonder if she will wake up," she said. "They do say that there can be deaths through asthma.


"And I really feel for her, because what she goes through I don't think she should have to go through. But it's just something we have all had to deal with."

Monitoring

Peter Kennedy has been a miner all of his life, and works for one of the



“ It's just something we have all had to deal with ”
Di Gee



Residents say they are badly affected by dust clouds from the mines

SHARED READ WATCHED/LISTENED

- 1 US grounds entire F-35 jet fleet
- 2 Why speaking English can make you poor
- 3 UK loses top AAA credit rating
- 4 'Many die' in Mali mountain clashes
- 5 China acknowledges 'cancer villages'
- 6 US nuclear waste tanks leaking
- 7 Pistorius spends night out of cell
- 8 'Nuns' caught drinking illegally
- 9 The babies who nap in sub-zero temperatures
- 10 Apple patent hints at smart watch

Most popular now, in detail

TOPIC 6 *Member Wendy Bowman – Mine Watch Historian*

Narrated

The clash of cultures of Miners versus pastoralists has seen Mine Watch active for 30 years as the Colonial traditions of the pioneer Bowman family holdings coincided with much of the Coal deposits sought over by Mining Companies and a State Government seeking coal taxes.

The relentless Mining march across Prime Agricultural Farming Land in the Camberwell area; driven first from one property – “Aston”; residing at Granbalang homestead, and now at “Rosedale Homestead” which is currently under siege by Aston Mining.

Throughout this period, by bitter experiences much has been campaigned on the Health impact of Mining on the Community, Mines Permanently Polluting Waterways, Incessant Mining Noise, Dairy Farming with Milking Cows having to eat Pastures contaminated by Mining dust and Power Station Fly Ash, and Cows and Horses struggling to breath the cocktail of Pollutants from Mines just across our boundary fence on Prime Agricultural land.

The story is best understood in *Attachment S10 – A15 page 115*, a previous Senate Submission on Agriculture in 1997. *It is not surprising that animals, such as Cattle and in particular Horses are susceptible to similar respiratory Diseases from breathing Polluted Air.*

Rainwater Tanks remain a Health Risk for Rural Areas particularly during droughts when dust storms are common and rainstorms are short in duration, without the long continuous rain to fill tanks to overflowing. Drinking water containers take on a brownish tinge after a while.(Attachment S10 –A13 pages 111-113 and 42- 48.

More recent samples of “Mud” which collected all the way along our guttering on its way to our Drinking Water Tanks , over the year 2012 since last cleaned, again confirms our fears regarding pollution Fallout ending up in our Drinking and Cooking Water. Refer 2013 Mud Analysis Attachment S11, high in Zinc, Lead, PAH, etc.

With no Lead or Zinc on the roof it suggests this mud Chemical Analysis verifies the presence of Power Station Fly Ash in one form or another.

“I was told not to drink the Tank Water. Do I have to purchase Water? Should I pay? – Tank Water has been the water supply for all persons out of Towns and cities in Australia for over 200 years”.

During the Camberwell Bridge St Aston Mine Blasting Gassing Incident in 2009 I was contacted by phone to assist the distressed woman and her animals; as Residents were by that time convinced neither the Mines nor the “Authorities” or the EPA would give advice or have Safety procedures to deal with such Emergencies in the Community. (*Attachment S10 Section 1.0 pages 9-11 & Section 4.0 pages 21&22 plus A1, A2 Pages 72 –77*). Apparently while you can’t breathe at the time of the Gassing and hopefully you can escape indoors, your Lungs -lining is damaged and begins to blister with a delayed fluid flooding of the lungs in the next 24 to 48 hours. (Refer Attachment S7).

To add insult to injury, after 30 years of exposure to Mining Pollution that I have warned others about during farming and living in the Camberwell area, recent Respiratory Medical Testing regarding my “Camberwell Cough”, has confirmed the extent of Lung Dusting present.

Living at “Rosedale” at Camberwell surrounded by Coal Mining, the Atmosphere even inside my Home has left me with “The Camberwell Cough”, nose drips continuously, sneezing has exacerbated, Respiratory – Sinus/antrum problems exacerbated since Open Cut Mining and Power Generation Pollution has pervaded throughout the Hunter Valley.

On one occasion when” Aston Coal spread Organic Growth Medium –OGM on high Spoil Heap over two days with a NW wind blowing it down the Valley to my Home; I was unwell for a good 10 days.”

“The Camberwell Cough” has reached the stage” that during sleep, Sinus drains into the Throat, and then takes an hour to clear(cough up)”. (*Does not this sound like “Black Lung Disease” the evening and morning racking cough of the Coal Miners who were “Dusted” years ago. When will the “Authorities” recognize that “Near Neighbours” are “Occupationally Exposed Persons” to Mining Operations?*)

“At a recent Medical checkup when I commented on my persistent “Camberwell Cough Professor David Bryant at St Vincents Medical Centre conducted Lung Function Tests which showed a 20% Loss, while MRI shows Dust on the Lungs. (*Is this what the “Authorities” say is a Farmers Occupational Hazard, or is it a Mining “Occupationally Exposed Mining Near Neighbour?*)

Two other long standing Residents on Farming land nearby are known to me, both have serious Health conditions including Family members affected as “Near Neighbours” to Open Cut Mining Operations.

TOPIC 7 *Member Carol Russell – SSHEG Historian*

Narrated

In 1992 it had become evident that PM2.5 Monitoring of Air Quality was a more direct measure related to Human Respiratory Diseases but fell on deaf ears in relation to the Redbank Power Station and other Mining Projects since.

SSHEG contend that PM2.5 Particulates move in the air wind currents so they are at their highest concentration in the plumes at the Pollution Source and varying concentrations along the “jetstreams drifting” Flow Patterns driven by prevailing Meteorological conditions. SSHEG do not accept the “Authorities” assumption that PM2.5 concentrations being very Fine Particles that they disperse evenly throughout the Hunter Valley, apparently based on City Urban testing and understanding. A number of reference papers elaborate on this debate. Refer Attachment S10 Section 1.0 pages 58 – 59, A22 pages 157 – 184.

By year 2000 to 2002 Community awareness began to contact Government Departments and Ministers seeking Health Studies and Health Risk Assessments for Power Station Projects by Macquarie Generation, such as alternate Fuels, the Liddel Cofuels programme, and Hexavalent Chromium story emerging from the Erin Brockerwich Pollution based Movie.

The use of Hunter Valley Power Stations as High Temperature Incinerators for disposal of otherwise Polluted liquids and solids; unfit for recycling or containing Toxic substances, are unregulated and Stack Plumes Pollutants are Not Monitored, even on an irregular basis. The concept seems to be; add these burnt Toxic substances to the Toxic Fly Ash Particulates and Plume Gases and hope they can't be found!

“SSHEG contend that all Major Projects, especially Mining and Power Station Operations, both Existing and Proposed should be subject to Accumulative Health Studies and Health Risk Assessments in order to restore the balance between Employment and Financial Revenue on one hand, and Community Health on the other hand”.

Further, being involved in the Hunter River Salinity Trading Scheme since its inception, the Pollution of Farming Wells, Dams, Streams, Creeks and Rivers from Mining Operations is a major Community Concern.

“Authorities” now blame “Dirty Saline Spring Water” oozing out of the creek and River banks for the Polluted State of the Hunter River. Closer is the truth that upstream of the Coal Mining, the Hunter River is fine, but downstream of Mining such as at Singleton, Water Quality is degraded and not fit for body contact. (Attachment S16).

Just as Mining disturbed land has to be Rehabilitated, so should Mining Rehabilitate the Water Systems they have disturbed, perhaps by reinstating Aquifer pathways through the disturbed Land. Attachment S10 extract below is typical of the Water pollution Stories across the Coal Mining region, and now called “The NSW Rivers of Shame” by the community. (Attachment S16)

Attachment S10 A15 page 115 extract

..... A number of years previously Coal and Allied had been permitted to mine under Bowman's Creek about 8 kilometres upstream.

2

I was informed by a land holder upstream that the base of the creek had broken and the water was pouring direct into the underground mine.

It apparently was flowing through the tunnels picking up the heavy metals, then continuing down an aquifer, rising again as a spring approximately 2 kilometres down stream. This water then continued to flow down through the Ravensworth area and on through Ashton property and then into the Hunter River.

Water testing showed the water flowing into the mine was 300 ppm salinity and came out of the mine into the springs and aquifers at 1200 ppm (cut off salinity is 700 ppm for lucerne).

This water added contamination to the already contaminated river water due to the then SPCC (later EPA), which permitted two mines upstream to discharge 2 Megalitres a day each into the river.

Our river pump was approximately 300 metres down from the convergence of the creek and river, consequently we took the full brunt of the contamination of the river water.

By way of example **, Conflicts over a proposed Coal Mine at Bickham in the Upper Hunter Valley relate to water scarcity, supply and connectivity, with the uncertain Science of hydrological modeling, bolstered by the context of drought and increasing public acceptance of Climate Change Science.

****Watercourses and Discourses: Coalmining
in the Upper Hunter Valley, New South...**

Linda Connor; Nick Higginbotham; Sonia Freeman; Glenn Albrecht
Oceania; Mar 2008; 78, 1; Academic Research Library pg. 76

As a member of the Upper Hunter Air Quality Monitoring Network UHAQMN Planning Committee, the Community's view is contained in the SSHEG Response to DECCW comments in March 2011. (Attachment S17)

Further Government maneuvering to dodge the Health damaging Camberwell Village Issues, resulted in the SSHEG response to the Katestone Report entitled “ International Best Practice to prevent and/or minimize Particulate Emissions from Coal Mining”. (Attachment S19)

TOPIC 8 *Member Dr Neville Hodkinson PhD*

Fundamentally: The NSW Government was asked by SSHEG on 11th November 2009 to investigate:-

***“What in the Hunter Valley Environment is making our Residents;
and especially our children sick”?***

After meetings with the NSW Chief Health Officer and her Expert Advisory Committee, SSHEG were of the opinion in Oct 2011 that a concurrent Investigation using Particulate Real Time Monitors (PM10, PM2.5 & PM1) and the collection of Airborne Particulates on special Filter Media from these monitor sampling streams was needed to determine what substances were in the Air.

Our Atmosphere is a mixture of Air constituent Gases - O₂ - N₂ – Ar – water vapour - trace gases; Pollutants - Gases – Vapours - liquid droplets – Particulates - aerosols, Pollens, Spores, Fungi, and other Biological materials and Organisms.

The Time of Day Measurement variations of each component part of the Air is the mixture the Community breaths, and it is not unreasonable to expect the above constituent Measurements would form the level of detail knowledge needed to establish a definitive Air Composition Analysis, from which the Health Risk considerations may be evaluated.

The National Pollution Inventory identifies the Hunter Valley Major Pollutant Sources are Plume Gases and Diesel Exhaust Waste Gases from the Products of Combustion in Power Stations and Coal Mining Operations, with Particulate Matter the third dominant Pollutant.

When it comes to hour by hour Measurement of the Asthma Health Impact of Pollens, Spores, Fungi, Biological materials and Organisms in Australia, this has basically been ignored.

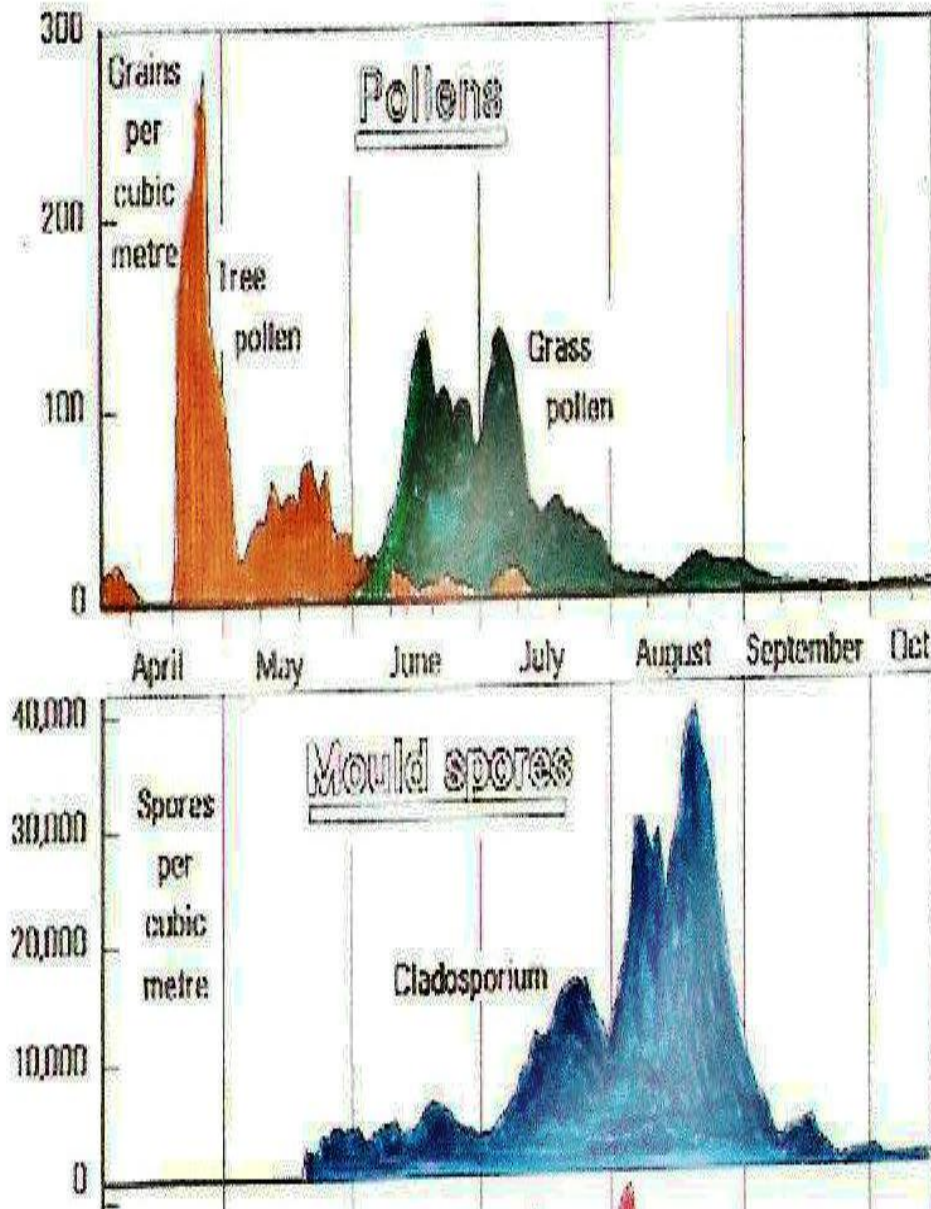
Perhaps only the Westmead Millennium Institute is equipped to comment. Certainly, they “have a growing database of Pollen and Mould counts including on NSW Central Coast where the aerobiological data is being used in conjunction with the Division of General Practice – based Asthma Study” (2003); including correlation with prevailing Meteorological conditions. New Zealand for example provide a Pollen Calendar, while Spain’s Allergy alert systems are far more elaborate.

All need to be continually remember that 50% of the Singleton Shire Community concern relates to Asthma, particularly in Children.

A Pollen calendar would identify the seasonal release, and this could be reinforced by Real Time measurement to dynamically capture the actual release time and concentration, which alter, for example, after rain periods.

Pollens, Spores Moulds, Fungi, etc., as typically wind pollinated types all become airborne, and when inhaled can cause allergic reactions to persons sensitive to certain types. Some Fresh Pollens burst on contact with water and spew out tiny one micron granules that are easily Inhaled.

Simplified Pollen Calendar is Illustrated.



Seasonal Rhinitis and Asthma Dr H Morrow Brown 2011

Similarly, Power Station Stack Plumes at Liddel, Bayswater and Redbank are the largest single Pollution Emission Sources in the Hunter Valley, emitting Toxic Gases – SO₂, NO_x, and Particulates – Toxic Fly Ash – Arsenic – Mercury – Lead – Zinc – Cadmium -Dioxin ; however these Plumes have no Hour by Hour or 24 Hr Real Time Monitoring or Operator Alarming particularly at night.

A Monitoring Network should set up a regime at Bayswater, Liddell and Redbank Power Stations including Sample and Analysis of Plume Gases and Particulate Matter that discharges from the various Boiler and Pollution Control stacks to atmosphere, day and night in continuous Real Time, as illustrated below.

Concept of Real Time Monitoring Systems to study the Emissions from Power Station Stacks in the Hunter Valley

Power Station Stack Plume is extracted from the Stack as a Flow Stream of Gases and Dust sampling which passes through the various Dust Sampling and Real Time Monitors with 8Hr Maximum, Minimum and 15 Minute Averages Data SCADA Storage and Archival Systems for evaluation

Gas/Dust Flow Stream from Stack	Gas & Dust Stream Volume Sampling every 5 Minutes	24HR Real Time Monitoring PM10	24HR Real Time Monitoring PM2.5	24HR Real Time Monitoring PM1	PM2.5 Gas & Dust Stream Volume Sampling every 5 Minutes	24HR Real Time Gas & Dust All Spectrum Analysis
---------------------------------	---	--------------------------------	---------------------------------	-------------------------------	---	---

The Residents who have been forced by Government edicts to endure living beside Power Stations built without the Community Buffer Zones of the past, have their Health compromised, while Environmental Pollution Controls and Regulations seem solely focuses on protecting only the Communities in Major Towns such as Singleton and Muswellbrook.

The cumulative Impact makes matters worse; in addition to the three Power Stations operating within the Hunter Valley, an additional three Power Stations are on the coast to the East and two are located to the west, along with the Sydney Smog entering the Valley to the South, all influencing the Air Quality and Pollution Story within the Hunter Valley. Refer Attachment S10 Section 5.0 pages 23 – 37, Map2, Terrain 2 and Map 7.

“Only three Pollutants are continuously Monitored by Macquarie Energy in the Hunter Valley Power Stations using in line Instrumentation; Nitrogen Dioxide, Sulphur Dioxide, and Opacity”. The Power Station Environmental Protection Licence exposes the lack of accountability, where one annual sample determines the compliance. The rest of the time who knows what Pollution can be emitted !

The Listed Pollutants nominated against Sampling Points 1,2,3,4 rely upon “one sample Annually”, as illustrated below.

The Pollutants; Copper, Dioxin & Furans, Hazardous substances (Type I and Type II Sb, As, Be, Cd, Cr, Co, Pb, Mn, Hg, Ni, Se, Sn, or V), and Volatile Organic Compounds all relate to “one sample annually from a sampling point that, at the time the sample is taken, is monitoring emissions from one of the four boilers on the premises and, at the time the sample is taken boiler is co-fired with coal and the maximum quantity(s) of alternate fuels authorised by this licence“.

Air

POINTS 1,2,3,4

Pollutant	Units of measure	Frequency	Sampling Method
Chlorine	milligrams per cubic metre	Yearly	TM-7 & TM-8
Copper	milligrams per cubic metre	Special Frequency 1	TM-12, TM-13 & TM-14
Dioxins & Furans	nanograms per cubic metre	Special Frequency 1	TM-18
Dry gas density	kilograms per cubic metre	Yearly	TM-23
Hazardous substances	milligrams per cubic metre	Special Frequency 1	TM-12, TM-13 & TM-14
Hydrogen chloride	milligrams per cubic metre	Yearly	TM-7 & TM-8
Moisture content	percent	Yearly	TM-22
Molecular weight of stack gases	grams per gram mole	Yearly	TM-23
Nitrogen Oxides	milligrams per cubic metre	Continuous	CEM-2
Solid Particles	milligrams per cubic metre	Yearly	TM-15
Sulfuric acid mist and sulfur trioxide (as SO ₃)	milligrams per cubic metre	Yearly	TM-3
Sulphur dioxide	milligrams per cubic metre	Continuous	CEM-2
Temperature	degrees Celsius	Yearly	TM-2
Total Fluoride	milligrams per cubic metre	Yearly	TM-9
Velocity	metres per second	Yearly	TM-2
Volatile organic compounds	milligrams per cubic metre	Special Frequency 1	TM-34
Volumetric flowrate	cubic metres per second	Yearly	TM-2

POINT 7

Pollutant	Units of measure	Frequency	Sampling Method
Nitrogen dioxide	milligrams per cubic metre	Continuous	In line instrumentation
Opacity	percent Opacity	Continuous	In line instrumentation
Sulphur dioxide	milligrams per cubic metre	Continuous	In line instrumentation

NOTE:

- Hazardous Substances mean: Type I and Type II substances (Sb, As, Be, Cd, Cr, Co, Pb, Mn, Hg, Ni, Se, Sn, or V).
- Special Frequency 1 means: one sample annually from a sampling point that, at the time the sample is taken, is monitoring emissions from one of the four boilers on the premises and, at the time the sample is taken boiler is co-fired with coal and the maximum quantity(s) of alternative fuels authorised by this licence.

Power Station Environment Protection Licence

The Community expects greater Pollution Emission Transparency !

- A. The SSHEG Presentation to the Singleton Public Meeting in November 2010 posed the key Pollution Questions for the “ EPA and Health Departments”:- (Attachment S12)**

What do we expect of the Expert Advisory Panel ?

Hunter Valley Polluted to Capacity ?

What has been Overlooked by the Authorities ?

Whats Special about Combustion ?

Can the Expert Panel Fix This ?

Health Synergy – Cigarettes versus Air Pollution.

- B. By March 2011 SSHEG summarized the various Community Issues in a Media Release entitled :-**

**“SSHEG promotes Government Environmental Health Changes”
March 2011 (Attachment S13 B,C & D)**

- 1. Primary Community Health Issues promoted by SSHEG.**
- 2. Reinstatement of the Healthy Hunter Valley Environment Balance.**
- 3. SSHEG suggested Pollution Remedial Mitigation.**
- 4. Government Mining Regulations Compliance and Enforcement Amendments.**
- 5. Specific Mining Compliance Enforcement Standards and Penalty Regime requiring Change.**

- C. By August 2011 SSHEG Targets Exposure Intensity, Toxicity& Health Risk.**

- 1. What does the Community expect to be studied ?**
- 2. What “Areas” of the Hunter Valley relate Disease to Pollution ?**
- 3. How best to measure Gaseous and Particulate Toxicity Disease Triggers ?**

- D. August 2011 SSHEG investigates Mining Dust Storms in the Hunter Valley.**

- 1. “Near Neighbour” Dust Intensity measured at 500ug/m3 for 40 minutes.**

SSHEG in September and December 2012 sought clarification of the details of the Speciation Testing underway in Singleton and Muswellbrook, specifically with respect to the Asthma Agents - Pollens, Spores, Moulds, etc; as they represent 50% of the Community Health concerns. (Attachment 14 - Letter 8th March 2011 & 8th dec 2012 and Dr Chant reply 19th Feb 2013).

After three years of Investigation, EAC Review and Debate, the weight of Best Medical Opinion is as follows:

(extracts from Attachment S14)

- 1. “With regard the feasibility of conducting a study to assess the relationship between Mining and Health; The Chief Health Officer’s Expert Advisory Committee (NSW - EAC) which includes Internationally renowned Epidemiologists concluded that, even when the Air Pollutants under investigation are known to cause illness, a Health Study in NSW was unlikely to show a statistically significant Health effect because the impacted Population is too small”.**
- 2. “Instead, given that the Health effects of Mine-associated Air pollution are well understood, a better approach is to improve our knowledge of the Sources and distribution of Air Pollution in Mining Regions. This knowledge will support the development of effective management strategies to protect the Health of the Community”.**

The Community is no longer willing to accept that nothing can be done to get to the bottom of the Pollution impacts on Human Health when all the pointers are that;

“Pollutants are known from Coal related Industries”;

“Health effects apparently are well understood”;

*and yet the “ Medical Establishment” would have us believe –
no Health Studies will show the connection.*

Its ironic that in the State of New South Wales the effect of population growth and unregulated industrialisation caused disquiet among many, but the change occurred in Newcastle by a group troubled by the soiling of goods in shops and the need to keep windows shut to exclude smoke, mainly from black coal burning in industry. That was 1947.

Going back in time, there was limited support from the Colonial Parliament to try to curb polluters, although in 1866 “Act to abate the Nuisance arising from

the Smoke of Furnaces”, then the NSW Public Health Act 1902, together with the 1906 and 1919 Local Government Act all had provisions for the regulation of gas, dust and smoke.

Newcastle’s air pollution worsened markedly after the opening of BHP Steelworks in 1915, as “smoke hangs over the city and suburbs like a pall”.

Newcastle’s concern over the physical and psychological health of residents, physical damage to buildings led to the Greater Newcastle Council to establish a Smoke Advisory Panel in 1947. The Council collected insoluble solids and in the first year of monitoring in 1951, the smoke Advisory Panel recorded a fallout of 87.5 tons per square mile per month; and by 1971 with overseas scientific help this reduced to 14.4 tons per square mile per month, with smoke density reduced by half.

These Newcastle initiatives and the London Smog of December 1952 where thousands of people died from the heavy air pollution, finally inspired the NSW Government to form the Sydney Smoke Abatement Committee in 1955, and then the NSW Clean Air Act of 1961 administered by the NSW Department of Health.

Power Station Plume Studies after the commissioning of the Bayswater Power Station in 1985 focused on the Hunter Valley Air Pollution impact, particularly Lead, Mercury and Fly Ash from the Black Coal firing of around 7.5 million tonnes each year. Emission Stacks are 248 metres high and 12 metres diameter at the top, located 16 Km from Muswellbrook and 17 Km from Singleton.

Numerous ANSTO Aerosol Data Sets are available with particular Hunter Valley studies in Mayfield (1998-2009), Muswellbrook (2001-2011), and Singleton and Grenville ACARP (2007).

Armed with this Legacy and Environmental knowledge why then has NSW Health been unable to have its voice heard in decision making ?

For Sixty years the NSW Communities have entrusted the NSW Department of Health with the responsibility to protect their Health.

But we are aware the current 2012 adage is:- *”We only protect 90% of the People 90% of the Time”*. It appears that the “NSW Clean Air Act” is no longer administered by the NSW Department of Health to protect the Community.

SSHEG consider that “Averaging” is the “Key Issue” used by those who should know better, disguising “Dangerous to Health Environmental Pollution” from being recognized and thus eliminated.

The long road for recognition that Passive Cigarette Smoking is a Health Hazard is now being overtaken by a far greater Population Health Risk by the Failure of Governments to Act on Air Pollution Hazards.

Historically, Human Health effects in Industrialised Topographical Valley locations have been reported as early as 1948 in the Science and Technology Journal;

“In Donora, Pennsylvania, a stable layer of air that persisted from October 26 to October 31, in 1948 affected about 6,000 out of the population of 14,000. Symptoms included coughs, eye irritation, nausea and diarrhea.

Of the 20 persons who died during the period (elderly and those with history of Lung and Cardiac diseases) 17 died on 29th October.”

Donora experienced Pollutants accumulating for 3 Days leading up to 29th October 1948 when the majority of deaths occurred:-

Five Days accumulating Pollutants in the Valley in stagnant air

40 % of the Population were Health affected; as 6000 in 14000

After 3 days 17 deaths occur or 1.2 deaths per 1000

800 animals died with 15 % of dogs dying.



Eisenstaedt/Time & Life Pictures/Getty Images

The mill town of Donora, Pa., seen Jan. 1, 1948. On Oct. 27 of that year, a smoky, lethal smog killed 20 people. The air was polluted by local steel plants, railroad yards and zinc works.

Is the Hunter Valley heading for the same situation ?

Topic 9 “Authorities” and Mining in Damage Control 2010 – 2013.

- (1) NSW Chief Health Officer and Expert Panel study from 2010 with only Major Towns Study expected earliest June 2013.**
- (2) Three NSW Department. of Planning Compliance Officers at Singleton in 2010. We note periods of Air Quality improvement since.**
- (3) Upper Hunter Air Quality Monitoring Network ** now operates at 14 Sites since January 2012. Pollution Telephone SMS Public Messaging NBG.**
- (4) Government response are outlined in *Attachment S20*.**
- (5) Katestone International Best Practice**

Guidelines for Mining Feb 2011.

- (6) Audits reports**
- (7) Noise Measurement Audit Bulga 2012**

****UHAQMN operated through 2012 displaying 1Hr Average Values with Phone SMS Alert Messaging when above 50ug/m3, however when the winter months appeared and the Air Pollution levels rose, and apparently under political pressure this was altered, as was the Web displays to 24Hr running averages with alert messaging at midnight.**

Once the UHAQMN identified and confirmed Dr Au’s Community connection between Air Pollution Dust Levels and Sickness by the excessive PM10 I Hour Average readings, it had done its job but was too embarrassing for the “Authorities” to deal with.

We ask the question “If the Health effects of Mine-associated Air Pollution are well understood, where are the Health Guidelines and Limits of exposure for individual Pollutants that are safe for Residents to go about their daily affairs, on their Torrens Title Land without restrictions?”

Such Limits of Exposure can then be scrutinized and tested to confirm they will not make our Children or our Residents to require Medication, Hospital visits, or become ill.

LIST OF SENATE SUBMISSION ATTACHMENTS ** Text added after this page.

- S1** SSHEG Community Health concerns dated 4th May 2010.**
- S2 Singleton Shire Healthy Environment Group identifies 37 Pollutants*
Submission to NSW Government 11th Nov 2009.**
- S3** SSHEG Historians Submissions and Representations 1992 – 2011.**
- S4 SSHEG Community Health Survey 2008-2009.**
- S5 Dr Au School Children Testing findings.**
- S6 NSW Health Minister ABC 4 Corners Interview March 2010.**
- S7 Mine Blast Plume Gassing Lung Damage
Risk of delayed Fluid Flooding Fatalities.**
- S8** Personal Testimonials of Sickness and Family Health Stories 2009.**
- S9 Dairy Farmer Family Health Testimonial.**
- S10** Second SSHEG Submission to NSW Health Nov 2010 (Attmt A15 **)
detailing Pollutants Toxicity, Drifting Patterns, and Combustion.**
- S11 Annual Roof Guttering cleaning “Rosedale Homestead” Camberwell
Mud Samples Chemical Analysis 2012.**
- S12 SSHEG Nov 2010 Presentation to Singleton Public Meeting.**
- S13 SSHEG promotes Government Environmental Health Changes”
March 2011**
- S14 SSHEG Correspondance seeking clarification on Asthma Speciation
Letter 8th dec 2012 and Dr Chant reply 19th Feb 2013.**
- S15 Compendum of Upper Hunter Ambient Air Quality Monitoring Data.**
- S16 NSW Rivers of Shame & Hunter River water quality unfit for contact.**
- S17 SSHEG Response to DECCW re UHAQMN March 2011**
- S18 SSHEG Submission Outline Presentation
of Community Health Concerns.**
- S19 SSHEG Response to Katestone International Best Practice Feb 2011**
- S20** NSW Government Response to SSHEG Community Submission**
- S21 WHO Newly found Health effects of Air Pollution Jan 2013**
- S22 Effect of Pollution on Asthma, Spain 2007**



SINGLETON SHIRE

[Redacted]
[Redacted]

[Redacted]

Dear [Redacted]

As requested by you at the meeting of the 30th of March we forward the following to inform you and the Health Department of our specific concerns, knowledge and requests.

There is a community feeling that there is a direct relationship between the health, well being and quality of life of our Community and the various sources of pollutants, particulate matter, gases and aerosols from industry. The issue is further compounded by the synergistic reaction of pollutants and our own specific natural environment, topography and weather. We acknowledge the natural pollutants such as bushfires, wood smoke and pollens can exasperate certain medical conditions.

There has been a focus on dust particulates but we feel what has been overlooked by authorities is the need for a holistic approach to our issues which focuses upon Air Quality, Water Quality, Food Quality and Health Services Support. Without a holistic approach to the impacts on our environment, resident's health will continue to be severely exasperated by the lack of appropriate measures to mitigate the daily impacts this community faces from various sources.

You have indicated that you would not limit your investigation to the five diseases you mentioned at the meeting. We offer the following list of community concerns raised with us; it is not in any specific order of priority.

- Asthma
- Breathing difficulties.
- Sinus
- Hay fever like symptoms



- Sneezing
- Itchy and Burning eyes
- Ear aches and ear problems
- Unexplained coughing or “Camberwell Cough”
- Irritable tickles of the throat
- People complain of mysterious illnesses, of headache and tiredness, of lethargy, aches and pains and headiness and fuzziness at times or just unwell or just lousy.
- Cancers and in particular higher incidents of Pancreatic, Bowel, Liver and Kidney.
- Non Hodgkin’s Lymphoma
- Leukaemia
- Incidents of childhood cancers and those of younger men and women.
- Brain tumours and other types of tumours.
- Thyroid
- Chronic Fatigue
- Fibra Myalgia, Poly Myalgia and Poly Myalgia Rheumatica
- Lupus
- Incidents of Autism and birth defects
- Behavioural problems and learning difficulties.
- Children who have symptoms of disorders but cannot be specifically diagnosed.
- Benign Brain Tumours
- Fatigue
- Depression
- Vascular Problems
- Small Birth Weight and Congenital Birth Defects as per Midwife Data Collection
- Motor Neurone disease
- Other unusual syndromes such as Klippel-Trenaunay Syndrome and Gardner Diamonds Syndrome.

Sufferers of the above diseases and disorders are known to us. Individual testimony can be obtained if requested. Some personal testimony is attached at the end of this document for your perusal.

At the meeting, you also asked us what our expectations, the following is a comprehensive list that would give assurances to community and go some way to satisfying their demands for action

We would want;

- An assurance that the Expert Panel reads and responds to our five listed demands as indicated in the submission on pages 4 and 5.
- The Expert Panel expanded to incorporate other departments and expertise needed to address the issues raised in our Submission.
- The Singleton Shire Healthy Environment Group, be given the opportunity to meet with Expert Panel prior to the commencement of their investigations.

- The Expert Panel to comment on the health impacts of rapid and concentrated exposure. e.g. Incident exposure.
- The Expert Panel to comment on the health impacts on short [2year], medium [5years] and long term [15year plus] exposure living in our community.
- The Expert Panel to comment on and clarify the exposure pathways for the residents and examine the risks of the various pathways and particularly the risk of bio accumulation in the body from exposure through soils, water and atmosphere.
- The Expert Panel to investigate the impact of frequent severe temperature inversions which traps the air pollutants.
- The Expert Panel to comment on the work and conclusions of Professor Nelson et al; 2008 as referenced in our submission.
- The Experts Panel's response to how health issues can be adequately dealt with and incorporated in Health Risks Assessments in the Approval and Planning process.
- The opportunity to review the findings in draft form before they are released by the Expert Panel.
- The Expert Panel's opinion on current mining practices associated with Bio Solid and OGM spreading, blasting and dust suppression as they apply to health impacts. The expert panel may be able to provide mitigation Protocols to limit the blasting practices of mines that allow Flame, Gases and Particulate Matter to spew into the atmosphere as a dangerous plume, relying upon dissipation in the air to mitigate the risk.
- The Expert Panel's opinion on current power station practices and emissions as they apply to health impacts.
- To offer as part of the solution a change in mining practices to increase the rate of rehabilitation and the reduction of exposed land. What would the Expert Panel's opinion of this be in the relation to improving health outcomes.

In relation to the Monitors and in the light that the DECCW Monitoring Network has previously received comments and suggestions from the community, we feel that information along with the following comments should come before the Expert Panel for deliberation.

On behalf of the Community, the Singleton Shire Healthy Environment Group insists that this Health Study be based upon PM2.5 Monitoring together with monitoring for other air toxins. We have the opinion that at the very minimum the monitoring of Mercury, Lead,

Chromium, VOCs, PAHs and Dioxins should be implemented after which the program should be expanded to include other environmental pollutants confirmed as being present including those reported in the National Pollution Index.

The Monitoring Network should set up a regime at Bayswater, Liddell and Rebank Power Stations and sample and analyse Gases and Particulate Matter that discharges from the various stacks to atmosphere, day and night in continuous Real Time. The monitoring must be long enough to capture all events and not be selective. It should be 24 hour monitoring and not averaged.

To assist with the investigation we have identified some patterns of “Fumes” as concentrated exposures in the following locations where repeated environmental incidents occur as prevailing winds or drifting Plumes exist, namely and not limited to; Camberwell Village, Glendonbrook, Goorangoola, Jerrys Plains, Maison Dieu, Singleton and Westbrook. “Near Neighbours” close to mines and power stations stack emissions require a specific Health Zone classification especially with regards to Children. Further we have knowledge of concentrated exposure West of Aberdeen at Rose Gale Plateau and on the rise west of Bunnan in the Upper Hunter Shire.

With regard to Singleton Shire Healthy Environment Study, Air Quality Monitoring and Analysis we highlight that;

- Our collective approaches to Authorities by way of personal approached, written complaints, written submissions etc over the last 20 or so years detail many of the evolving concerns.
- A previous Community response was given initially as feedback to public meetings regarding Dust Monitors. (refer DECCW files)
- A further written response to Terms of Reference regarding proposed Dust Monitors was provided.
- Our comments relating to the type of investigation envisaged are contained throughout our Submission Document Dated 11th November 2010.
- Our comments relating to the type of monitoring and analysis equipment is limited to the duration of testing being sufficient to locate the zones or localities where residents do experience health impacts.
- Our comments relating to the location for investigations of community concerns are listed based on concentrated exposure, short, medium and long term environmental exposure Health factors; many of which have been reported to the Authorities over recent years.
- Our comments relating to power stations focus on determining the composition of gases and particulate matter that discharges from the various stacks to atmosphere, day and night, in continuous real time.
- Our comments relating to mines focus firstly on blasting practices that allow flame, gases and particulate matter to spew into the atmosphere as a dangerous plume in an uncontrolled manner, relying upon dissipation in the air to mitigate the risk.
- Our comments relating to mine operations focus secondly on waste disposal, rehabilitation, and dust.

We draw your attention to various ACARP Reports; The Hidden Cost of Electricity Report, John Court's Report done for DUAP on the Macquarie Generation Co Fuel Program and others outlined in The Singleton Shire Healthy Environment Group submission and highlight the numerous overseas investigations one of which is detailed in our Submission on pages 15 and 16 regarding 60 different Hazardous Pollutants being identified in a Coal Fired Plant in USA.

In conclusion, [REDACTED], we are mindful the requests and demands that have been outlined will come as a shock to some but feel they are justified. Our Community is carrying an unfair burden for the rest of the State and Nation. That burden is contrary to our Human Rights. The Health Study must be independent and rigorous. It is ultimately the Government's responsibility for our environmental health impacts and it only the government who can fix them. We respectfully request that you do all in your power to progress this matter and keep us advised on the process and outcomes and of course we will continue to progress our aims and objectives. We do appreciate your attention to this matter and will readily assist you in anyway we can.

Respectfully yours,

The Singleton Shire Healthy Environment Group on behalf of the Singleton Shire Community

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

****Personal Testimony**

I would like to have included in the study, rare benign tumours as they do not get counted in any registry. They have to be treated as if one has cancer, that is surgery and radiation as in my case , all very distressing , I was fit and healthy I played five sports a week before I was diagnosed and I have lived in Singleton for over 50 years . I personally know of three people who have been treated with rare benign brain tumours in Singleton and to me if they are so rare the numbers don't add up for a town our size.

<<<<>>>>

As a resident of singleton with concerns regarding air pollution in the Muswellbrook/Singleton areas, I felt it necessary to tell my own story hopefully to persuade you and your colleagues to look closely at what's happening to our health in this region. In March 1997 I moved from Sydney to Singleton Shire. Over this time I have noticed a great deterioration in air quality. In parallel to this I have experienced a worsening of my health and quality of life. As a sufferer of chronic sinus and the mother of two young boys ages eight and ten who are asthma sufferers this worries me greatly. There are no studies to show it but I am certain my health is better when away from home. Within a day or so of leaving I gradually improve often not needing the medicines which I rely heavily upon. The headaches and sinus symptoms I experience are becoming more frequent and I really feel we will be unable to continue to live in Singleton if coal mining is doubled as predicted in the next five years. My husband is sixth generation Singletonian and loves his home as do we. Our business, family and friends are all here. I know of other families who have left the area because of chronic ill health mainly due to respiratory problems. One family who comes to mind have seen big improvements in their health since leaving Singleton. I realise that there are invariably multiple factors which contribute to the picture presented coal dust, blasting chemicals, diesel fumes, power station emissions, agricultural sprays to name a few. As such I feel it is imperative for a detailed ongoing analysis of our air components to let us know if our kids are being subjected to a toxic cocktail. Many people talk of the high cancer rates here but the question is at present another unknown. I sincerely hope you are able to help the people of Singleton find the answers we deserve.

<<<<>>>>

My husband's family have been here in Singleton and the Hunter Valley since the mid 1820s I have made this place my home since we were married. I did not have breathing problems before coming here nor did I have any problems living in Cessnock for twelve months. It has worsened over the past twenty odd years and is more intense over the last ten and further again the last five years or so.

It is made worse by pollutants, temperature inversions and wind. Singleton has unique topography which creates temperature inversions about 70% of the year. According to a Health Department's brochure I am to stay indoors and perhaps run the air conditioner; I cannot live my life like that nor can I afford to run an air conditioner. I find it ironic that the coal and power industries who I believe in the main are contributing greatly to my condition would benefit by my running an air conditioner.

There is no part of my home and life where particulates and dust do not invade and everyone in Singleton has the similar problems. I believe that the expansion of industry is

affecting our health and this will not improve until Government regulates for better controls on the cumulative effects of all industries. I believe we have one of the highest proportion of diesel fuelled vehicles, machinery and train movements concentrated here adding to the mix.

More recently I am experiencing early morning coughing and more sporadic coughing during the day. I am using a preventative measures to help my asthma. I have more than enough days with burning eyes more near the tear ducts and believe that over the last month this is worsening with many others commenting on their eyes "burning". I believe the coughing is exasperating a bladder problem. I have twice had turns where a chemical like smell has rendered me almost unconscious and to this day no answer has been found about the source. At times there is a metallic taste to the air and many days the air has a distinct odour. Many times there is an odour of coal tar. As soon as the weather cools my health and well being deteriorates. I do not run to the Doctors every time I feel unwell as I feel I would be there a majority of days during the year and simply can not afford it. I have a daughter diagnosed with heart Arrhythmia and she suffers Vasovagal episodes. Air quality does have an affect her and like me if she leaves the area within a short time she feels better but worsens on her return. No one would believe me if I'd tell them I feel better in Sydney.

I have five grand children who live in this town; the three older all suffered problems when younger

The amount of problems seems to have been extraordinarily bad luck for my daughter and son in law because there were no answers for them. The youngest who is eight has sensory problems and symptoms of many disorders. We are told he has a unique set of problems to which no one can give a specific diagnosis. To me there are many children around his age who have problems.

<<<<>>>>

My husband and I have five [5] children born between 1993 to 1999, of which three [3] of my children [names of kids] have asthma related problems. Our worst is my 12 yr old [name] whose health constantly changes every day from ok to really bad which extends to doctors visit or hospitalization. She often asks if she will get any better

My children have been hospitalised for weeks and my youngest was sick for 3 months going to the doctors twice a week because the antibiotics were doing nothing for him .I had to rush him to hospital 4 times within those 3months because he would have a reaction to what ever was in the air he was breathing; it scared the living day lights out of me as it would you when you 4 year old happily puts himself to bed only to be wake up to be rushed to hospital because he could not breath and his body was so limp before doctors said he had Asthma .

My daughter goes to the specialist every 2 months changing her medication and still this doesn't seem to be helping her. She had trips to the John Hunter for numerous tests and yet to be told they cannot do much to help but maybe we can move; this is not an option for us unless some one buys our business. Then we live on generational owned land; why should we move because of these problems that we feel were not there years ago. We decided to bring our children up in a health environment that we feel doesn't exist any

more. What is going to be done?

We have a 45 minute drive to town where all my children go to school. We have lived in the same house on the same property for the last 15 years and to us the only thing that has change is the bigger mining and power industries getting closer and spreading out more in the valley.

The other week I was told not to drink my tank water because of the pollutants in our air falling on our roof .We don' t have access to town water.

Are these changes why some of my children are so sick? Sitting up nights ringing hospitals travelling in and having my 12 year old say to me why can' t I live like everyone else. Why should my children have these problems and they were not born with these respiratory problems. At times when their asthma stirs up they also end up with infections or pneumonia I feel that this all has to do with the industries getting bigger.

<<<<>>>>

I would like to raise the inhabitable coal dust on residents living close to mining, which are not covered by OH&S act and the cost on the taxpayer Monitoring done by mining should be zoned to dust collection and results recorded daily, by an independent authority.

Monitoring should be located according to weather conditions and location of waterways.

Trains carriages should be covered and engines checked for emissions, monitors located along rail lines in populated areas

Health risk assessments done for each mining exploration proposal in the future

Health risk assessments on applications pending approval and ultimately population health comes before mining.

Fatigue and depression related illness.

<<<<>>>>



SSHEG Historians submissions and Community representations

Timeline of some of the Actions

- 1992 CR starts personal request to Trevor Henderson form EPA at Redbank site and letter to the EPA(October 2000) formally requesting that they require PM2.5 monitoring of the development.
- 1995 LM starts personal contact raised health concerns with Health Department.
- 1997 Macquarie Generation Burns Alternate Fuels. Issues raised with planning and health.
- 1998 June after a public out cry and meeting about the burning of alternate fuels a Macquarie Generation Community Consultative Committee was set up. Carol Russell, Lyn MacBain & Tony Laffin nominated and accepted as community representatives.
- 2000 July Submission on Theiss landfill asked for a health Risk assessment and pointed out Government duty of care.
- 2000 July Submission by community group ‘Dump the Dump’ raised issues on existing health impacts.
- 2000 July Nicole Gough submission on landfill (31/7/00) also raised issues of health of the Hunter Valley and asked for a study.
- 2000 August delegation visit to Dr Refshauge Minister for Planning. Health concerns addressed in that meeting.
- 2000 August 14, Addressed Singleton Council Raised health Issues.
- 2000 August Submission to Singleton Council
- 2001 April Attended the National Dioxin Program Workshop in Sydney. Raised the issue of Liddel co-fuel programme and the effects on the health of the Hunter community.
- 2001 May Submission to the NEPM Review on PM2.5 Particle Standards in which the absence of health study and failure of government duty of care was addressed. Submission against the Sodium Chlorate Plant (can't find date; 2002/3 or a bit earlier) also raised issues of lack of health study and the additional cumulative impacts. Environmental justice and duty of care also raised in that submission.
- 2001 May 27th, Submission DUAP Sterling Manufacturing –Health Issues raised
- 2001 December, Meeting with Refshauge, promised Health Study. Letters on behalf of a number of community residents who met informally at a private home to Dept. Health through Kerry Hickey
- 2002 March 11th, letter to Kerry Hickey from group requesting a health study for Singleton.
- 2002 October 1st to Kerry Hickey in reply to Bob Debus' response comforting us with Action for Air policy
- 2002 May 22nd Letter to Sam Haddad formal request for Health Study as a state development issue
- 2002 Addressed Mines Related Councils and got support for community desire for a health study.
- 2002 February, objection to the burning of the Oyster stakes at Liddell, letters to DUAP and the EPA (Jan 2002 26th to the Regional Director).
- 2002 15th February Letter asking Eddie Obeid as Minister of Fisheries to contribute to the cost of a Health Study for the Hunter since it was his Oyster stakes that were polluting our atmosphere.

- 2002 April 26th Letter to Sam Haddad asking for an EIS and Health Risk Assessment for the Macquarie Generation co-fuel programme.
Court Report on the Mac Gen co-fuel programme (?date round about 2000 or perhaps as late as 2002) recommended “a health risk assessment for metals in the environment and in particular cumulative impacts of hexavalent chromium should be undertaken to confirm that community exposure is acceptable.”
- 2002 May, Addressed Singleton Council, re Mac Gen burning alternate fuels.
- 2002 September Sacked from Mac Gen Community Committee. No responses to why only excuse that a Buffer Zone committee was to be formed NOTHING has ever been built on the Buffer Zone. It was a way to get rid of the questioning community.
- Late 2002, Glenn Albrecht makes radio appearances on Upper Hunter ABC radio talking about the impact of mining on Upper Hunter residents and environment,
- 2003 February, Hunter Valley residents contact Glenn Albrecht to speak of their distress in the face of continued expansion of mining in their area.
- 2003 April, Glenn Albrecht works on the idea of “place-algia” in which one’s home becomes a source of distress rather than comfort, building on the concept of ‘nostalgia’, the sickness caused by yearning for one’s home while absent from it.
- 2003 February, Objection to the Warkworth Mining extension. Asked for health Risk assessment and discussed issues of environmental justice, government duty of care and the synergistic effects of dust and multiple pollutants
- 2003 20th Feb, Letter to DG requesting inclusion of Health Risk assessment in the DGRs for Specialty Coal at Glendonbrook
- 2003 February, Submission on Planning Process. Health issue assessment raised.
- 2003 February, Submission against Redbank II power station again requested a health risk assessment and pointed out the government’s duty of care.
- 2003 March, Address Trades Hall Council, Muswellbrook.
- 2003 May, Glenn Albrecht, Nick Higginbotham from University of Newcastle start study in the Upper Hunter.
- 2003 August, Application for grant for a Environmental Justice Centre for the Upper Hunter.
- 2003 September a number of Singleton residents Participated in the EPA CAPER Air Quality Workshop at Maitland (Clean Air Plant and Equipment Review of the 1997 Regulations) at which health study was one of our priorities. This was reflected in the official notes of the sessions.
- 2004 July Addressed Mt Owen commission of enquiry on health impacts of mining operations and need for regional monitoring. Presented a written copy of the address.
- 2004 September, Mine Watch addresses Minerals Council Environmental Workshop.
- 2005, Glen Albrecht Paper and findings released supporting concerns raised.
- 2005 May Participated in conference Environmental Health in the Hunter 2005 Dr. Craig Dalton.
- 2006 August Submission Mount Owen.
- 2008 November Public Meeting called.
- 2008 October. Submission Wambo; Health issues raised.
- 2008 October, Singleton Healthy Environment Group is formed by Public demand. Starts correlating data.
- 2009 March Asked for PM2.5 dust Monitor for Singleton
- 2009 February letter to Lisa Corbyn requesting dust monitor
- 2009 April submission for SCHEG to Human Rights Consultation (This was the day of a very bad dust event)
Email same day to DEECW
Email to Dr John Wiggers HNE Dept Health

- 2009 August, Addressed Mines Related Councils Narrabri reaffirmed support for a Health Risk assessment/study.
- 2009 October 2nd on behalf of SSHEG emailed David Kitto requesting a health risk assessment as part of the DGRs for the Warkworth Mine extension.
- 2009 October 26th, Submission against Bayswater B, asked for health study. Pointed out that both Singleton Council and Muswellbrook council requested a health assessment as part of the EIS for Bayswater B.
- 2009 November 10th Participated in Radio National Programme 'Future of Coal' raised Health Issues.
- 2009 November Public Meeting Submission presented to meeting with mandate given to proceed to government bodies.
- 2009 November, Letters to David Kitto, Sam Haddad, Minister of Planning Keneally, Hon.George Souris, Minister for the Hunter Jody McKay, Premier Nathan Rees Why was the Singleton Community not receiving the same level of 'Duty of Care' as the Wyong Community as a Health Risk Assessment had been required by the Director General's requirements for Wallarah Underground mine and not a requirement for Bayswater B power Station. No replies to date.
- 2009 November 18th Public meeting re; Air quality monitors, DECC handed a submission of Community Expectations.
- 2010 February 15th submission against Abbey Green Pit noted absence of health assessment and argued government duty of care to rectify.
 Contact George Souris re no response to submission.
 Contacted Media 'friends' re no response to our submission.
 Assisted in supplying contacts and background information for Four Corners Report
 Continued to raise Health Issues in relation to SSHEG Submission. With SSHEH
 Attended meeting with Jodie McKay
 Attended Meeting with Lee Rhiannon. Spoke at public Meeting.
 Attended meeting with Kerry Chant and Officers of Health Dept and SSHEG members.
 Sought information about exceedences from DECCW.
 May 25th Left on DECCW Website in respect to Why the Upper Hunter Air Quality Data is not available for residents as is for Lower Hunter and other areas in the State

Over the years there have been probably hundreds of calls to DECC & Planning

****Attachment 15 extract from Attachment S10 - 2010 Report re Camberwell**

Submission to Senate Select Committee on Agriculture 1997
Story of how the Farmer's property and livelihood was "Stolen"

My story is only one of many in the mid-Hunter Valley.

My Husband died in 1984 aged 51 years, I found myself embroiled in things that I had never dealt with before.

Firstly Energy Australia decided to put a double 35KVA line right across the property. The negotiations took a while, trying to make them understand that we did not want poles and wires near any house or in our farm land.

"Ashton" was a beautiful property possibly the best watered in our area.

The North and West boundaries were Bowman's Creek with the associated alluviums, Bowmans Creek had never dried up during droughts, irrigation was always possible from four holes due to the incredible aquifers underlying the Valley.

The southern boundary was the Hunter River with the associated black soils and Glennies Creek was our eastern boundary again, alluviums.

There had been five dairies on the property from the 1920's worked by five share farmer families.

There were also two maintenance men employed.

Gradually over the years these dairies were combined into one large dairy and run in conjunction with beef cattle and hay production.

In 1986, I discovered an open cut mine had been granted consent to mine on the western boundary, no buffer zone was included in the consent.

From the commencement of mining in about 1988 the whole property was constantly engulfed in dust, both from blasting and drag lines working 24 hours a day.

1

The noise from these operations kept the farmers awake at night as well as the large spotlight on the dragline swinging to and fro across the property.

Living there became a nightmare.

The dairy herd would not eat the irrigated pasture at times especially after a blast or strong westerly winds. They would walk out of the paddock and try to find feed near the creek. **It** was during a very dry time and native pasture was very limited.

I employed an Agricultural Consultant to determine the herd feeding problem. His results showed excessive amounts of dust on that particular feed, barley (that has minute hair-like structure on the long leaves), which collected and held the dust. The herd developed coughs, which were quite audible after blasts and windy days.

The next problem was our lucerne growing along Bowman's Creek. It was showing stress and dying in areas.

I contacted the next door mine as we considered it had to be the constant dust. They brought a "lucerne expert" up from Victoria who walked through the paddock, kicking it with his boots and inspecting a plant or two at ground level. He said we had nematodes.

I asked to be shown these, producing a spade we had brought but he declined.

Very soon after his visit we discovered it was the water from Bowman's

Creek.

The so-called "lucerne expert" I found out later was running a coffee shop with his wife? (He must have been a talented expert)!!!

A number of years previously Coal and Allied had been permitted to mine under Bowman's Creek about 8 kilometres upstream.

2

I was informed by a land holder upstream that the base of the creek had broken and the water was pouring direct into the underground mine.

It apparently was flowing through the tunnels picking up the heavy metals, then continuing down an aquifer, rising again as a spring approximately 2 kilometres down stream. This water then continued to flow down through the Ravensworth area and on through Ashton property and then into the Hunter River.

Water testing showed the water flowing into the mine was 300 ppm salinity and came out of the mine into the springs and aquifers at 1200 ppm (cut off salinity is 700 ppm for lucerne).

This water added contamination to the already contaminated river water due to the then SPCC (later EPA), which permitted two mines upstream to discharge 2 megalitres a day each into the river.

Our river pump was approximately 300 metres down from the convergence of the creek and river, consequently we took the full brunt of the contamination of the river water.

I had a Water Resources person to look at our problem and was told to purchase a water testing unit and only irrigate at less than a particular salinity level.

During a couple of very hot and dry summers, there were times that we could not irrigate due to high salinity levels. One January we were unable to use the water for twelve days.

I was forced to "dry off" half the herd as we could not provide the green feed necessary for milk production.

3

By this time we had had enough. The mine next door was contacted and acquisition was requested.

The share dairyman then left, he was working as hard as usual but the returns from his share were less than half that he had received previously due to the smaller herd and milk being rejected by the factory for dust contamination.

The rejections occurred after very windy periods and blasting.

When a refrigerated vat is emptied, of the milk, under strict hygiene regulations the farmer must wash the vat using specific detergents, then must leave the lid open for a period to dry and eliminate any odour. This was the cause of the dust entering the vat.

I was able to employ a local retired couple to milk and another person to irrigate etc.

It took many very nasty and prolonged periods of negotiation with the mine personnel to reach a deal.

I was told that I was to keep the dairy running because they were going to prove that dairying and mining could co-exist.

I then had to borrow money to keep the dairy running until the company made the decision to purchase.

The whole deal was most unpleasant, my Lawyer stating that he could not believe the conduct of the mining personnel.

I finally sold to them in 1994. There was no compensation from the Government or the mining industry for loss of income over those years (which was considerable) or compensation for the loss of water quality.

During these difficult years, my manager, who had lived and worked on Ashton from the age of fourteen became ill. I believe it was the anger and

4

frustration he lived through during those years, watching the demise of a property he loved. He was proud of what he had achieved in his years of management. The pressure he was under progressed his health problems to the stage that an immediate quadruple by-pass was ordered.

He was unable to work after this, so part of the negotiations with the mine had to include a "super type" payment for him as he had always known he could retire on Ashton. Approximately 18-24 months later the mining company shut the dairy. (I was proven right!!!).

Mine is only one story of many stories from this area of the Hunter Valley. So many farmers were left with no water, or the water contamination was so bad it could not be used.

The area of land that has been laid waste by mining is large. Those mountains of blown-up rock rubble they call the rehabilitated land is toxic and no stock can graze.

The rocks contain the same heavy metals as the coal seams, which leach out during rain, contaminating the gullies and creeks and eventually entering the rivers.

These rubble mountains are unstable and will sink and move for hundreds if not thousands of years. The trees planted only grow very slowly and according to a study done about fifteen years ago will eventually collapse due to the lack of trace elements (these also leach out with rain).

The diverse and rich Hunter Valley is already under strain from contaminated water, land use is no longer predominately agricultural, 600 square kilometres of mining has been taken from agricultural use.

Communities and families have been uprooted and dispersed by the forced sale of properties and villages.

5

If I had known in the early 1990's what I now know about water and dust contamination from coal I would certainly have had the dust and water regularly tested.

****Attachment S1 extract** Appendix 3 - 37 Pollutants SSHEG Identified.
 Major pollutants (in order of magnitude) emitted from mining and electricity generation to the airshed of the Singleton-Muswellbrook postcodes area, and their NPI Health Hazard Ratings (www.npi.gov.au; accessed 20 May 2009)

Pollutant	Pollutant load in airshed (kg/yr)	NPI Health Hazard Rating 3 = very high hazard to health; 2 = medium hazard to health 1 = harmful to health
Sulphur dioxide	132,730,000	1.5
Nitrogen oxides	62,640,000	1.5
Particulate matter 10 μ	55,160,000	1.2
Carbon monoxide	11,860,000	2
Hydrochloric acid	2,190,000	1.5
Particulate matter 2.5 μ	1,520,008	1.2
Sulphuric acid	1,450,000	2.3
Total volatile organic compounds	1,310,000	No rank given
Fluoride compounds	544,000	1.5
Boron and compounds	178,100	1.7
Formaldehyde	110,001	1.3
Manganese and compounds	73,923	1.3
Zinc and compounds	21,361	0.8
Cyanide (inorganic) compounds	7,950	1.8
Chromium (III) compounds	4,991	1.2
Ammonia (total)	3,810	1
Copper and compounds	3,784	1

Nickel and compounds	3,473	1.2
Lead and compounds	2,029	1.6
Toluene	1,860	1.3
Benzene	1,134	2.3
Cobalt and compounds	1,095	1
Chromium (VI) compounds	674	2.5
Arsenic and compounds	559	2.4
Xylenes	535	1.3
Polycyclic aromatic hydrocarbons	507	1.3
Selenium and compounds	459	1.7
Cumene	369	1.2
Ethylbenzene	318	1
n-Hexane	232	1.3
Cyclohexane	212	0.7
Mercury and compounds	195	1.7
Beryllium and compounds	159	2.3
Acetaldehyde	79	1.2
Antimony and compounds	62	1
Cadmium and compounds	40	2.3
1,3-Butadiene	18	2.7

Attachment S20

NSW Government Response to SSHEG Community Submission

NSW Premier replied “ *principle concern is the Health and welfare of local residents*” and appointed the Chief Health Officer of NSW Health to investigate, which resulted in the Independent Expert Advisory Committee on Air Quality in place by April 2010, with the early meetings in May 2010.



Air Pollution Expert Advisory Committee

Date	Wednesday, 22 th June 2011
Time	4.30 pm – 6.30 pm
Venue	Greenwood Conference Room, Level 11, 73 Miller Street, North Sydney
Teleconference Details	Dial in: 1800 766 715 Conference Code: 318 253

Organisation	Title	Name	Attendance
University of Western Sydney	Member	Prof Alison Jones	T/ C
University of Sydney	Member	Prof Bruce Armstrong	Present
CSIRO	Member	Dr Mark Hibberd	Present
University of Sydney	Member	Prof Guy Marks	T/C
University of Newcastle	Member	Prof Michael Hensley	T/C
Director REMS SSWAHS- NSW Health	Observer	Prof Bin Jalaludin	Present
Director, HNEAHS PHU- NSW Health	Observer	Prof David Durrheim	Apology
CHO, NSW Health	Observer	Dr Kerry Chant	Present
Director, EHB - NSW Health	Observer	Prof Wayne Smith	Present
Director, SWAHS PHU - NSW Health	Observer	Dr Vicky Sheppeard	Present
Risk Unit Manager, EHB- NSW Health	Observer	Mr Adam Capon	Apology
EHB - NSW Health	Secretariat	Ms Hanisah Corner	Present

- Focus:-
- # *To advise on alternative and more appropriate means of measuring exposures to air pollution.*
 - # *To advise on possible pollution mitigation strategies for developments around the Hunter area.*
 - # *To consider health effects from air pollution in the context of the broader health status of the community.*
 - # *To provide advice on potential health studies in the area.*

While the minutes of the first Expert Advisory Committee meeting of 6th May 2010 notes:- “*the purpose of the Expert Group is to look at population health, not individual health of single residents*”, this clearly differs from the SSHEG Government submission detailing of 9th Nov 2009, where much of the Singleton Shire Population is a dispersed rural community, and Local Doctors are reporting Asthma in Children is a major community concern..

Singleton Shire Healthy Environment Group

“Response to IPC Rixs Creek Report Aug 2018”



A community-based group looking to address Environmental issues affecting Singleton Shire residents

██████████
██████████
██████████
Author: Dr Neville Hodkinson PhD

We seek identification as to what is making our Children and Community Sick so they can be mitigated by OH&S Compliance Orders.

SSHEG Focus on Health

SSHEG is Not Anti Mining or Anti Power Stations

Independent Planning Commission NSW
Level 3, 201 Elizabeth St.
Sydney NSW 2000
Email: ipcn@ipcn.nsw.gov.au

“Rixs Creek Continuation of Mining Project SSD 6300”


Clearly the Independent Planning Commission to be truly Independent needs Specialist Health & Coal Industry Pollution Disease Expertise in order to adjudicate, especially for “Near Neighbours to Open Cut Coal Mines – McDougalls Hill, Singleton Heights, Country Acres Caravan Park”.

Thus, SSHEG calls for a Culture Change to “*Minimise Mine Air Pollution Emissions at their every source*”, and referencing 15 Minute PM10 and PM2.5 Real Time Monitoring at specific Resident Localities for Mitigation.

The 28th August 2018 IPC Report for Rixs Creek Continuation 2015 demonstrates that NSW Health[#] is insisting upon “*Mitigation of impacts below traditional acquisition zones*“, while the mine to gain approval is simply trimming its Coal Mining Rate to fall below the already outdated Evaluation Modelling Guidelines and NEPM WHO 2005 based Standards.

SSHEG Community Healthy Living focuses upon Mine Pollution Disease Impacts on Residents - breath by breath; insisting that mines Mitigate Pollution by “*Minimising to World Health Organisation ongoing identified Guidelines*” over each 15 Minute period, of Cumulative Locality readings for PM10 and PM10-2.5 & PM2.5: **That is the Healthy Air we Breath criteria!**

Hunter New England Local Health District
Hunter New England Population Health
Direct Contact Details
[REDACTED]

 Health
Hunter New England
Local Health District

#

29 June 2018

Ms Genevieve Seed
Senior Planning Officer
Resource Assessments | Planning Services
NSW Department of Planning and Environment.
320 Pitt Street | GPO Box 39 | Sydney NSW 2001

Dear Genevieve

Re: RIX'S CREEK COAL MINE CONTINUATION OF MINING PROJECT SSD 6300 - RESPONSE TO REVISED RESPONSE TO SUBMISSIONS

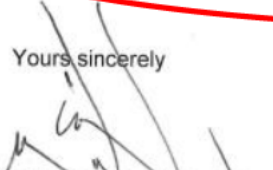
We understand that the Independent Planning Commission have sought further clarification as to whether NSW Health's concerns with regard to air quality have been addressed in the proponent's response to submissions and revised response to submissions.

Further review of Appendix H has revealed that the new NEPM air standard for annual average PM10 of 25 $\mu\text{g}/\text{m}^3$ is not predicted to be exceeded in the residential areas immediately north of Singleton are but at least one residence is predicted to reach 25 $\mu\text{g}/\text{m}^3$ and many other residences will be in the vicinity of the goal due to incremental emissions from Rix's Creek and existing air pollution from surrounding mines. Many private residences that are not in the acquisition zones within McDougall Hill and Singleton Heights will have significantly increased predicted daily PM10 impacts from the mine – many with an incremental average 24 hour PM10 impact of 20 to 30 $\mu\text{g}/\text{m}^3$ (Appendix H, Table 3). The cumulative impact at the Country Acres Caravan Park is predicted to exceed the NEPM average 24 hour PM10 goal of 50 $\mu\text{g}/\text{m}^3$ (Appendix H, Table 6, Figure 3 and 4 - noting that the tolerance of 5 days of exceedance of the goal per annum has been removed from the revised NEPM). There are also incremental impacts in mine owned residences and residences subject to acquisition.

While the EIS focuses on assessment criteria we note that there is no evidence of a threshold below which exposure to particulate matter (PM) is not associated with health effects. Therefore, it is important that all reasonable and feasible measures are taken to minimise human exposure to PM.

On review of the revised response to submissions we note that multiple residential areas will experience increased PM10 impacts. If the project is approved it will be important to consider the need for mitigation of impacts beyond traditional acquisition zones, the impact on residential expansion surrounding the mine and targeted interventions such as those promoted through the Dust Stop Program.

Yours sincerely


Professor David Durrheim

Its Community Healthy Living versus Mining Employment Balance!!

The extent of the Disease Concern is outlined in SSHEG Submission of Dec 2015 and the Response to Mine Response to Submissions (RTS) by NSW Health and EPA as illustrated below:-

L, however, we note these were difficult to identify in this document. Figure E26 in Appendix L provides the most detailed cumulative annual average PM₁₀ predictions for the highest impact year of 2023 (below). The areas highlighted with orange lines indicate significant population areas predicted to lie between 20 and 30 µg/m³ in Singleton Heights and McDougalls Hill and higher in Camberwell. This suggests the annual PM₁₀ emissions will exceed the current NEPM of 25 µg/m³. We acknowledge the response that health impacts are predominantly driven by PM_{2.5} rather than PM₁₀ effects, however, there is emerging evidence that the long term exposure to the coarse fraction (PM_{2.5-10}) can have respiratory impacts.

NSW Health Response to RTS 8 Dec 2016

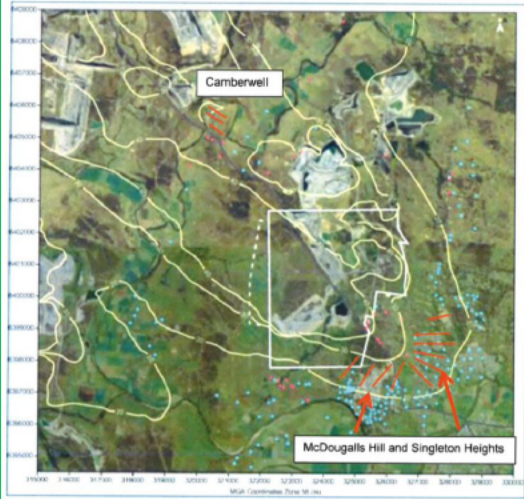


Figure E-26: Predicted annual average PM₁₀ concentrations due to emissions from the Project and other sources in 2023

SSHEG Rixs Creek Mine Continuation Dec 2015

In the Short Term, the Upper Hunter Air Quality Monitoring Network has confirmed the Valley Air Pollution Streamline Flow Drifting behaviour of PM₁₀ and PM_{2.5}. The WHO Disease significance now of Rixs Creek Mine Daily PM_{2.5} Emissions is coupled with the South Easterly Valley Air Drifting Flow Patterns towards Singleton Residents is illustrated in Figure 1 below. This combination establishes the requirement for Rixs Creek Mine along with other Hunter Valley Mines to strategically locate “Concurrent PM₁₀, 2.5 TEOM Type Monitors”, which are then expected to provide the basis for PM_{2.5} Fine, PM_{2.5-10} Coarse, and PM₁₀ Real Time Pollution Mitigation Controls to protect Residents.

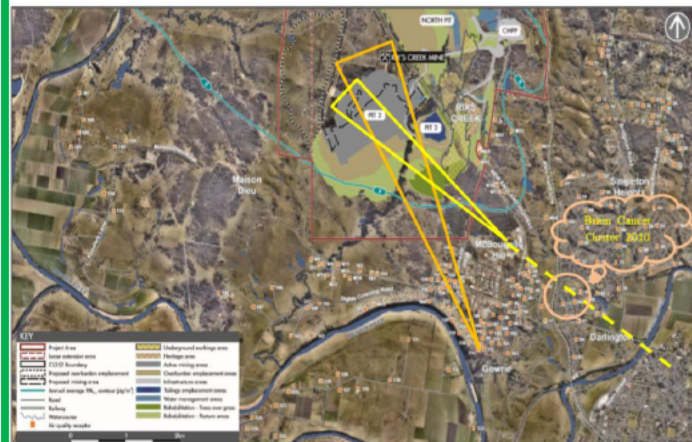


FIGURE 1 Illustration of Air Pollution Drifting Impact on Singleton Assessment Resident Groups

EPA Response to RTS Report 15 Nov 2016 ATTACHMENT A: Environment Protection Authority's Air Quality Assessment Review RTS

The Environment Protection Authority (EPA) has undertaken a review of the Response to Submissions (RTS) report titled “Rixs Creek Mine – Continuation of mining project Environmental Impact Statement Response to Submissions”, dated 20 October 2016, in relation to the Rixs Creek Coal Mine Extension Project, SSD 8300. The EPA has also reviewed the documents titled “Air quality and greenhouse gas assessment, Rixs Creek continuation of mining project” by Todoroski dated 26 August 2015 (Todoroski 2015) and the Environmental Impact Statement dated 28 October 2015. The EPA provides the following comments in relation to air quality matters.

Estimated Impacts from the proposal

The assessment predicts exceedances of the air quality impact assessment criteria at non-mine receptors as summarised in the table below, taken from Todoroski 2015.

Impacts greater than criteria – non-mine receptors

Receptor ID	24-hr					Annual			
	PM ₁₀					PM ₁₀	PM _{2.5}	TSP	Dust deposition
	50	cumulative # extra days				30	8	90	4
criteria	year max	2017	2020	2023	2026	year max	year max	year max	year max
1	2020 71	2	21	32	4	2020 34			
	2023 77					2023 36			
19		1	1	3	1				
61		2	5	5	4				
140		3	2	4	1				
161		1	1	2	1				
163		3	3	1					
164		1	1	1	1				
170						2017 78	2017 14		2020 5.3
						2020 100	2020 16		2023 6.4
						2023 103	2023 17		2026 6.4
						2026 99	2026 16		2029 5.3
171						2023 36			
						2017 41	2017 9		
						2020 47	2020 10	2020 101	
						2023 46	2023 10	2023 99	
						2026 43	2026 9	2026 95	
172						2017 43	2017 9	2017 92	
						2020 39	2020 9		
						2023 39	2023 9		
173						2026 34			
						2017 37	2017 9		
						2020 37	2020 9		
						2023 36	2023 9		
						2026 33			
174						2017 35	2017 9		
						2020 36	2020 9		
						2023 36	2023 9		
						2026 39			
175						2017 38	2017 9		
						2020 39	2020 9		
						2023 38	2023 9		
						2026 36			
176						2017 38	2017 9		
						2020 39	2020 9		
						2023 38	2023 9		
						2026 36			

Rixs Creek planned 40yr Mine Life approval in 1995 included Air Quality Assessments for 22nd year 2018, only for Annual Average Dust Deposition & Dust Concentration levels; with 24 Hour TSP (<50um) HVAS sampling at Singleton Heights, Retreat and East of the Mine. Most common winds were WNW-SE or SSE, as now illustrated. **More Residents now live SE of Mine Pollution Plumes.** Mine Polluted Air Drifting SE Patterns impact Singleton Heights; as does the Diesel Exhausts of the New England Hwy & Coal Trains, & Power Stn Fly Ash Plume drifts.

RIX'S CREEK MINE COMMUNITY CONSULTATIVE COMMITTEE MEETING MINUTES –27/05/2014

Rehabilitation has been designed to shield the operation from nearest residences / townships and to move away aligned to production rates.



Red = 1989 Population area. Green = 2013 Population area.

Singleton Heights is of particular Community Health concern having previous Disease form following on from the Brain Cancer Cluster Study in 2010 in this area; located then just to the East of Rixs Creek Open Cut Mine and on the Eastern downhill slope depression which is conducive to “*Ground Impacting SE Air Drifting Pollution Patterns*” moving from the Upper Valley Composite Air Pollution with its Power Station Fly Ash and accumulated secondary aerosols Air. This descending SE Drifting Air Pollution Cocktail leaving the Rixs Creek Mine further adds the Diesel Exhausts of Trucks climbing the Hill of the New England Hwy and further adds the Coal Trains Diesel and Track Pollution (Residents Homes that back onto the Railway line). This Cumulative SE Drifting Air Pollution “Descending into the Singleton Heights Homes would be expected to take the line of least resistance – in this case apparently following the SE directional road pathways thus concentrating the Air Pollution Jetstream passing Homes at street corners – such as was inferred in Singleton Heights Cancer Cluster Study [Method 1](#) evaluation related to “*The cluster was reported in two intersecting streets*”- Statistical assessment of the chance of occurrence of geographic clustering.

It is the SE – NW Road orientation sloping further downhill that can concentrate the SE flowing of Air Drifting Pollution providing the Topography passage at “*Intersecting Streets*” compared to the obstacle to free flowing that Homes exhibit. Somehow what the Community reported as a Statistically significant Cancer Cluster was turned into a study of Street corners Statistically, whereas the Community was reporting the observed Air Pollution SE Drifting Flow over this area of the Singleton Heights.

SSHEG considers [Method 2](#) employs the “Statistical Averaging” disguise of hiding the “*Data Intelligence*”. Firstly, the Community had separately identified the “*Specific Environmental Hazard*” at Singleton Heights as the locality closest to the Railway line, Highway and the proximity to Rixs Creek Mine. Secondly, the Poisson Statistical Analysis should have been restricted to the entire area of Singleton Heights at the time, not to distort the study by including the distant area of Singleton Township.

Recognising the difficulty in confirming Cancer Clusters and since the 1995 Rixs Creek Mine Approval Air Quality is now heeded, it still remains that **Singleton Heights Air Pollution Disease Risk is a Community Red Flag.**

Serious questions were posed to EPA in the SSHEG Submission of 20 Jan 2017 on “Clean Air NSW Consultation 2017”; extract below:-

Without prejudice

Part B Why has NSW Health and NSW EPA been unable to utilise the Minimisation provision of Government Air Pollution Acts, and what guidelines could be used to facilitate their use to “Clean Air in the Hunter Valley” ?

Firstly a lead by NSW Health and NSW Environmental Health is needed to set Compliance standards for “Hunter Valley Open Cut Coal Mines Precincts” separate to other Jurisdictions and based on three factors not catered for by existing National Standards. Developments in better targeted Short Term Air Pollution Disease associations Research and progressive World Health initiatives since 2014 provide an ongoing basis for these changes.

- I. Mines without Buffer Zones with Residents forced to Coexist beside Open Cut Black Coal Mines.
- II. Resident Disease Impact criteria from PM2.5 and PM1.0 (Mine Diesel use), Black Carbon Air Pollution.
- III. Demography of “Near Neighbour Residents in terms of Air Pollution Disease Susceptibility. Eg Schools, Elderly, etc
- IV. Disease latency from repeated 15 Minute Air Pollution Exposure spikes related to concentrated Mine Pollution Air Drifting patterns in addition to the local Environs Cumulative Air Pollution levels at the time.
- V. Quantitative Analysis to Exposure the fallacy that Indoor Air Quality is not related to Outdoor Air Pollution levels, thus how should farmers be protected ?

Independently the World Health Organisation Scientific Advisory Committee and Expert Reviewers on Air Quality in October 2013 declared “*There is a linear Dose-Response Relationship between Particle Levels and Human Disease with No Threshold that is Safe*”; having previously in June 2012 declared “*Diesel Engine Fumes can cause Lung Cancer and belong in the same potentially deadly category as asbestos, arsenic and mustard gas*”.

Together, whether its Air Pollution from Mining or living close by to Exhausts and other Pollution Emissions of Highways or Railways, or a Cocktail of both; it’s the Air Pollution Drifting Pattern of these Emissions at Ground level that determines the Expose Risk they pose to Human Health, short and long term.

In the Hunter Valley the “*Corridors of Mine Air Pollution*” are observed to generally Drift across the Valley floor on the WNW-SE and SSE Corridors, as well as into Microvalleys pockets adjoining the Escapements.

The 1995 Rixs Creek Mine Consent apparently recognised these impacts by limiting Mine operation when Air Drifting Wind Velocity was adjudged at the time to impact Camberwell, Maison Dieu and Singleton Heights. **Perhaps this continues today!**

AIR QUALITY	DUST SUPPRESSION
<p>23. (i) The Applicant shall cease all mining operations at any time when the average hourly wind velocity from any direction exceeds 10 m/s.</p> <p>(ii) The Applicant shall cease all out-of-pit overburden dumping and shaping, topsoil stripping and emplacement and bund wall and earthworks construction at any time when the average hourly wind velocity exceeds 5.6 m/s from the segment due west clockwise through to the northeast.</p> <p>(iii) The Applicant shall cease all mining operations at any time when visibility is impaired on the New England Highway as a result of mining operations in accordance with the requirements of the Council.</p>	<p>24. (i) The Applicant shall provide a standby water cart for each operating water cart proposed in the EIS at each stage of mining.</p> <p>(ii) the Applicant shall install automatic water sprays on the coal stockpiles such that the stockpiles are sprayed when the wind speed from any direction exceeds 5.6 m/s.</p> <p>Automatic water sprays have been installed on coal stockpiles in compliance with this condition. Refer to Section 3.8. As part of the future operations it is proposed that adequate road watering equipment will be available for the scale of the operation.</p> <p>ENVIRONMENTAL OFFICER</p> <p>25. Prior to the commencement of any construction or operations in the coal lease application area the Applicant shall appoint an on-site environmental officer responsible directly to the mine manager whose qualifications are to the satisfaction of the Department.</p>
Bloomfield Collieries Pty Limited - EIS - Rixs Creek F1117A.H:Jw, November 1994	Bloomfield Collieries Pty Limited - EIS - Rixs Creek F1127L.H:Jw, November 1994

Today, SSHEG calls for a Culture Change to “*Minimise Mine Air Pollution Emissions at their every source*”. Our comprehensive 10 years Air Quality Health investigations Outlined below are worthy of further consideration by all as a way forward.

Outline of SSHEG Focus on Health

“SSHEG contend that all Major Projects, especially Mining and Power Station Operations, both Existing and Proposed should be subject to **Cumulative Health Impact Studies and Health Risk Assessments** in order to restore the balance between Employment and Financial Revenue on one hand, and Community Health on the other hand”. Don’t ignore **WHO Air Pollution carcinogen announcements** in Oct 2013.

It is clear that **new Health Research Methods need to be developed** to provide perhaps a Real Time Technological based **Health Study approach** which will overcome the current Medical Impasse where Epidemiology Cohort studies for **small Community Localities** are statistically excluded from Health Studies.

In the meantime the Coal Mining juggernaut rolls on unchecked, creating unbearable “**Dust, Fumes, Plumes, Fly Ash, Combustion Gases, Diesel Exhaust Pollution, Incessant Mine Noise** and Trains rattling through beside Houses, Ground Vibrations, Glaring lights, Sleep disturbances, Psychological Pressure, Irrigation Creek Water unfit for cropping, squeezing out Near Neighbours and Villages, encircling Villages and “**plundered Communities and Prime Agricultural Land**”.

It should be noted ** that Individual Open Cut Coal Mines across the Hunter Valley from 2006 onwards provided 24Hr continuous Particulate Matter PM10 Realtime Monitors at around **76 locations** (2013 SSHEG Senate Attachment S15). These **Monitors are mostly under utilised for reducing Dust and Pollution Emissions**, being tagged as “**Realtime PM10 Monitors**” but reported as **24 Hour Average PM10 Monitors**”.

The insistence by “**Environmental Authorities**” to allowed the farcical situation of “**Data Averaging**” to flourish and distort the Pollution Emission reporting by Operating Industries in NSW; while at the same time equating this to **Resident’s Minute to Minute Pollution Exposures** to Gases, Dust, Fumes and Vapours and the Hunter Valley Brown Haze Aerosols build up during the Day, and with Industry impunity.

A strong argument therefore exists to base PM measurements on 15 Minute Averages to bring “**Near Neighbours who are Occupationally Exposed Persons to Mining**” onto the same footing as Underground Miners exposed to Air Quality similar to that being experienced from time to time by farming families above ground nearby.

SSHEG were of the opinion in Oct 2011 that an **Holistic Technical Investigation using Particulate Real Time Monitors (PM10, PM2.5 & PM1) and the collection of Airborne Particulates on special Filter Media** from these monitor sampling streams was needed to determine what substances were in the Air.

Our Atmosphere is a mixture of Air constituent Gases - O₂ - N₂ - Ar - water vapour - trace gases; Pollutants - Gases, Ozone, Dioxin - Vapours - liquid droplets - Composite Particulates - Fly Ash, VOC’s - aerosols, Pollens, Spores, Fungi, and other Biological materials and Organisms.

The Time of Day Measurement variations of each component part of the Air is the mixture the Community breaths, and it is not unreasonable to expect the above constituent Measurements would form the level of detail knowledge needed to establish a definitive Air Composition and Speciation Analysis, from which the Health Risk considerations may be evaluated, leading to **better targeted Pollution Mitigation Controls to safeguard the Health of the Community**.

The Health Risk is Real, as all it takes is a repeat like the 1948 Donora Pennsylvania five day stable layer of Valley Air where on day three 17 (1 in 1000) people died; overall 40% Health affected, 800 animals died with 15% dogs dying.

In 2008 two Singleton Medical Doctors were reporting to NSW Health that Open Cut mining and Coal fired Power Stations were Polluting the Hunter Valley Air to the extent that Residents and especially Children experienced Medical episodes the likes of which were previously unheard of, and medications were struggling to counter these Disease impacts. Especially, Mine Blasting drifting Plumes were responsible for Orange skies, single breath Respiratory Attacks, Hospitalisation etc. now only treated as Fume EPA Non-Compliances.

As early as 2005, both Mining Companies and the Community were being advised by eminent Health Authorities “*No convincing evidence of mining impact on Community Health*”.

Since then, the World Health Organisation in June 2012 declared “*Diesel Engine Fumes can cause Lung Cancer*” related to the composition and attachment of Toxic substances to Carbon Particulates, especially PM2.5 and PM1.0; and in October 2013 declared “*There is a linear Dose-Response Relationship between Particle Levels and Human Disease with No Threshold that is Safe*”; again, identifying PM2.5 (Fine) and PM10-2.5 (Coarse) Disease Relationships.

It is therefore surprising that NSW EPA and OEH have not so far acted to incorporate these Mining related Pollution Human Disease PM2.5 Mitigation Controls; and in the case of Rixs Creek allowed the exclusion of the PM2.5 evaluation for the 2014 Continuation, while allowing what amounts to a fresh Project by altering the mine Plan in the years 2021 – 2025 Mine extraction Rate to apparently sneak under the somewhat lax Air Pollution Modelling limits.

It is no wonder that NSW Health would not water down its objections to the guidelines to Mine Approvals, rightly reminding the Independent Planning Commissioners, as is also the SSHEG opinion, that lower Mine Pollution over, and well below the “Industry Status Quo” are now overdue. **That is “*Minimisation of Mine Pollution At all times*”.**

What then is the basis for the Serious Questions being posed by NSW Health on Mine Planning for the reduced levels of Mine Pollution below 2005 World Health Organisation Declarations, and for Mining to heed the need for Australian 2015 NEPM Standards?

It’s no longer a matter of Australian NEPM “Guidelines” being exceeded in the Hunter Valley on a daily basis, but the Community demanding recognition that “There is No Safe Threshold Air Pollution”.

SEPTEMBER 5 2018 - 11:00AM NEWCASTLE HERALD

Doctors invite NSW Government ministers for a coalfields stay to experience air pollution first-hand

Joanne McCarthy

- HUNTER doctors have taken the unprecedented step of inviting government ministers to stay overnight near Upper Hunter coal fields and experience the “crisis” in air quality first-hand because “we’re not sure people outside the region understand how bad the situation is”.
- More than 30 doctors have sounded the alarm after a spate of recent air quality alerts in the Upper Hunter, including five straight days of poor air quality in August, even before an expected extreme drought-linked hot, dry and windy summer ahead.
- They have signed a letter inviting Environment Minister Gabrielle Upton and Health Minister Brad Hazzard to the coal region before summer after a [dramatic spike in Singleton Hospital](#) emergency department admissions in 2017 coinciding with hot, dry conditions and declining air quality.
- In the letter to Ms Upton and Mr Hazzard the doctors, including pediatrician and University of Newcastle Associate Professor John Boulton, described worsening air quality as a “crisis... that is causing serious health damage”.
- “This pollution is harming people. It is difficult for people outside the region to understand the effect this pollution is having on people in the Hunter. We ask you both to come for a one or two day trip to the region to meet affected communities and health professionals to discuss this crisis,” the doctors wrote in the letter which was supported by more than 70 community and environment group members.....etc
- The Upper Hunter also experienced increased toxic air pollutants from Bayswater and Liddell coal-fired power stations, doctors said.
- Doctors are concerned that modelling commissioned by the EPA showed that annual average fine particle air quality standards were “unlikely to be attained in Singleton and Muswellbrook into the future as coal production in the Hunter Valley is expected to continue to increase”.
- The modelling found human-made sources of fine particle pollution needed to be reduced by 50 per cent to meet the standard.
- Singleton doctors Tuan Au and Robert Vickers said the region needed stronger action from the NSW Government to protect public health.
- “When there are spikes in coarse particle pollution there is a decline in the health of local residents, particularly those with asthma, heart and lung disease,” Dr Vickers said.
- “The number of spikes we have seen recently shows the government is not holding up its responsibility to maintain air pollution standards and our population is the one suffering.”

Health Authorities and Governments around the World, including the NSW Government have been struggling with the Oct 2013 WHO declarations after 40 years of Medical Research on Air Pollution and Human Diseases associations; **A paradigm shift in Air Pollution Knowledge** now demand changes to protect Community Health.

Within two years in Feb 2016 the National Environmental Protection (Ambient Air Quality) Measure NEPM took effect, this new Air Pollution Knowledge impact on Open Cut Coal Mining and Coal fired

Power Stations now sees Communities demanding action to reduce Short term Mine Pollution, while NSW Health are also insisting upon changes that amount to tighter EPA restriction on Airborne Mine Pollution at all times.

Now after five years delay, and the last three years delay by NSW EPA since Feb 2016 “to introduce the amended NEPM criteria”, this now leaves Community Health Protection in the hands of National Legislation to address the new WHO Air Pollution Knowledge impact of Open Cut Coal Mining and Coal fired Power Stations, while NSW Health continues to remind Mining of the Disease Risk situation of all Mines.

Air Quality			NSW Health Agency submission 22 Sept 2016
There is no evidence of a threshold below which exposure to particulate matter (PM) is not associated with health effects. Therefore, it is important that all reasonable and feasible measures are taken to minimise human exposure to PM, even where assessment criteria are met.			
On 15 December 2015, the National Environment Protection Council (NEPC) agreed to vary the National Environment Protection (Ambient Air Quality) Measure (NEPM). The amending instrument took effect on 4 February 2016. The new standards are as follows:			
Pollutant	Averaging Period	Maximum concentration standard	Maximum allowable exceedances
Particles as PM ₁₀	1 day	50 µg/m ³	None
	1 year	25 µg/m ³	None
Particles as PM _{2.5}	1 day	25 µg/m ³	None
	1 year	8 µg/m ³	None

Reference: <https://www.legislation.gov.au/Details/F2016C00215>

The EIS explains that, at the time of preparation of the report, the Environment Protection Authority (EPA) had not yet prescribed changes to the air quality criteria for NSW following the amendment to the NEPM. However, it would be expected that the EPA will introduce the amended criteria within the foreseeable future, and the EIS should have taken this into account.

SSHEG remain of the opinion expressed in Oct 2011 after discussions with the “NSW Health Expert Advisory Panel” that Holistic Technical Investigation based upon Particulate Real Time Monitors with 5-15 Minute readings of PM10, PM2.5 & PM1.0, in combination with the collection of Airborne Particulates on Special Filter Media from these monitor Sampling Streams was needed to determine what substances, what variations and what levels of Pollutants are in the air Residents breath at any one time.

Based upon these detailed Particulate Monitoring Studies the Health consequences of these Airborne Pollutants could then be evaluated.

The reality is the NSW Chief Health Officer and Expert Advisory Committee abruptly ceases investigations in the Upper Hunter Valley in Oct 2013, which soon coincided with the abandonment of the “Interagency Taskforce on Air Quality in the Hunter Valley” set up in 2014.

Interagency Taskforce on Air Quality in NSW

As a key regulator of air pollution, the EPA established the high-level Interagency Taskforce on Air Quality in NSW in 2016 to address significant air quality issues across NSW.

The taskforce

provides input to and advice on air quality management through cross-agency collaboration and support prioritises strategies to reduce exposure to particulate matter, which has major impacts on human health develops cross-government recommendations and actions to meet national air quality standards coordinates communication of government actions to manage significant air quality issues in NSW

The taskforce includes representatives from

NSW EPA

Office of Environment and Heritage

NSW Health

Department of Planning and Environment

NSW Department of Industry - Division of Resources and Energy

Transport for NSW

Department of Premier and Cabinet

The Taskforce replaces the Interagency Taskforce on Air Quality in the Hunter, by expanding the remit of the previous taskforce to consider significant air quality issues across NSW.

Is it that Residents Health in the Upper Hunter Valley has been left in the hands of the debating club of the “Interagency Taskforce on Air Quality in NSW”, with NSW Health, NSW EPA sidelined in the decision making process????

Clearly the Upper Hunter area of NSW is treated as a separate Environmental Entity for the Mining Industry while the rest of NSW is reported against outdated 2012 Standards and Disease Risk Guidelines.

Thanking you in anticipation of your considered response.

Dr Neville Hodkinson PhD

Singleton Shire Healthy Environment Group

SSHEG Rixs Creek Mine Continuation Dec 2015

Without Prejudice

Singleton **S**hire **H**ealthy **E**nvironment **G**roup
“Rixs Creek Mine Continuation Dec 2015”



A community-based group looking to address Environmental issues affecting Singleton Shire residents

Author: Dr Neville Hodkinson PhD

We seek identification as to what is making our Children and Community Sick so they can be mitigated by OH&S Compliance Orders.

SSHEG Focus on Health

SSHEG is Not Anti Mining or Anti Power Stations

RIXS CREEK Continuation 2015

**SSHEG Submission of concern regarding the
Rixs Creek Mine Continuation of Mining Project 2015-2037**

Mining Pollution Health Impact

This SSHEG Submission outlines the Singleton Shire Health Concerns focusing upon

“The Reduction of the Health Impact on Residents Exposed to Air and Noise Pollution from Mining Operations, being Near Neighbours as Occupationally Exposed Persons under Federal and State Legislation”;

SSHEG calls for a Culture Change

“Minimisation NOT Time Averaging to Hide Air and Noise Pollution”

In view of the WHO Air and Noise Pollution Human Disease findings, SSHEG expects it's only a matter of time before a **“Mining Industry Culture Change towards Minimising Air and Noise Pollution”** occurs; moving away from the Industry Attitude; **“We operate within our limits”**.

Time Averaging currently allows Mines to “Control Operations so as not to exceed their Target Daily PM10 Limits” covering periods of some Hours well above even outdated NEPM standard PM10 Rates, for Example.

Dr Neville Hodkinson PhD

Page 1

SSHEG Rixs Creek Mine Continuation Dec 2015

SSHEG concern for the Rixs Creek Mining Continuation Project is based on the need to restore a better balance of the “Health Risk for Residents” to compensate for the removal of the long standing practice of “Mine Buffer Zones” effectively separating Residents and Industrial Pollution; this approach establishes that “Near Neighbours, Farmers and Farmers Families and Villages and especially Children” are presently bearing the brunt of Mine Pollution on account of their proximity to Mines as illustrated below. Increased Production rates only amplify the Residents Concern.



AECOM

SENSITIVE RECEIVERS - SOUTH
Rixs Creek Continuation of Mining
Environmental Impact Statement

FIGURE 12-2

“Near Neighbour Singleton Shire Residents” experience a range of “15 Minute STEL Pollution Exposures” Air Pollution Exposures which are now associated with “Lung Cancer, Cardiovascular Diseases and Respiratory Diseases, Bladder Cancer, etc.

Significantly, WHO has refocused attention on Short Term (Minute and Latency Days) Particulate Matter as PM2.5 (Fine) and PM 2.5 -10 (Coarse) association with a range of Human Diseases, while Quantifying Long Term (Annual Average) PM10 Air Pollution Exposure Population Disease Impact.

Better targeted Future Community Health Surveys now muted in 2015 to repeat 2008 SSHEG Community Health Surveys are expected to better quantify impacts for Short (multiple 15 Minute Pollution Exposures), Medium (Daily Average Exposure) and Long Term (seasonal Exposure - 3 Months); compared to the current Epidemiology Cohort based Annual Average Pollution Exposure and NEPM Standard reference base.

In the Medium Term, SSHEG therefore in making this submission, considers that additional “Concurrent Real Time Air Pollution Monitoring” is long overdue (TSP, PM10, PM2.5 and PM1) with Gases and Particulates Matter Sampling for Microscopy and Chemical Analysis including Gases {Ozone, CO, CO₂, SO_x, NO_x, CH₄, formaldehyde, and VOC’s) located for example at Receptor 138 or selected from Resident’s Complaints History for Assessment Groups J, G & H in Figure 12.2 above.

SSHEG Rixs Creek Mine Continuation Dec 2015

In the Short Term, the Upper Hunter Air Quality Monitoring Network has confirmed the Valley Air Pollution Streamline Flow Drifting behaviour of PM10 and PM2.5. The WHO Disease significance now of Rixs Creek Mine Daily PM2.5 Emissions is coupled with the South Easterly Valley Air Drifting Flow Patterns towards Singleton Residents is illustrated in Figure 1 below. This combination establishes the requirement for Rixs Creek Mine along with other Hunter Valley Mines to strategically locate “Concurrent PM10, 2.5 TEOM Type Monitors”, which are then expected to provide the basis for PM2.5 Fine, PM2.5-10 Coarse, and PM10 Real Time Pollution Mitigation Controls to protect Residents.

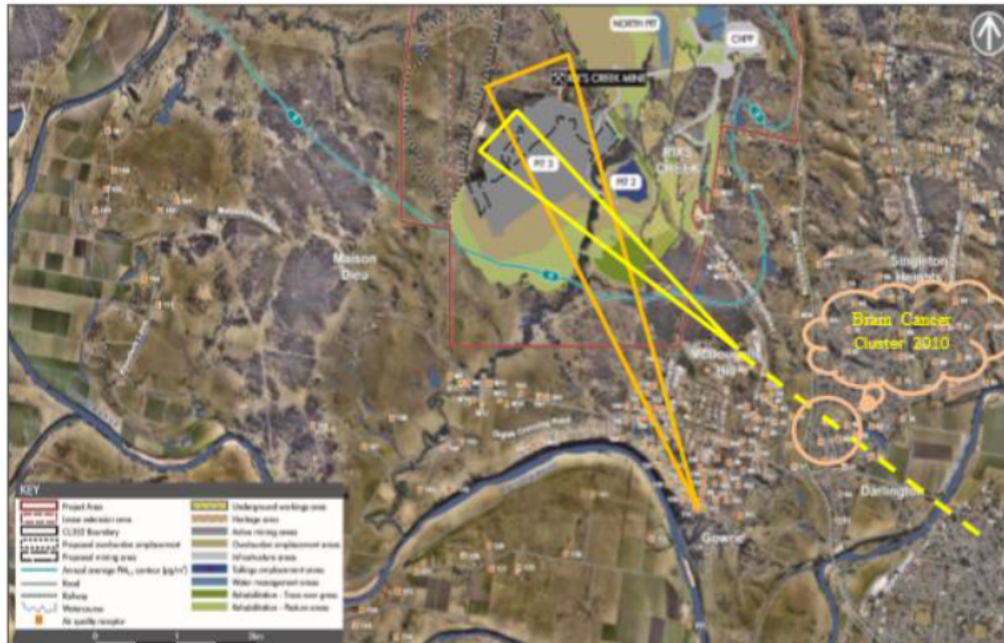


FIGURE 1 Illustration of Air Pollution Drifting Impact on Singleton Assessment Resident Groups

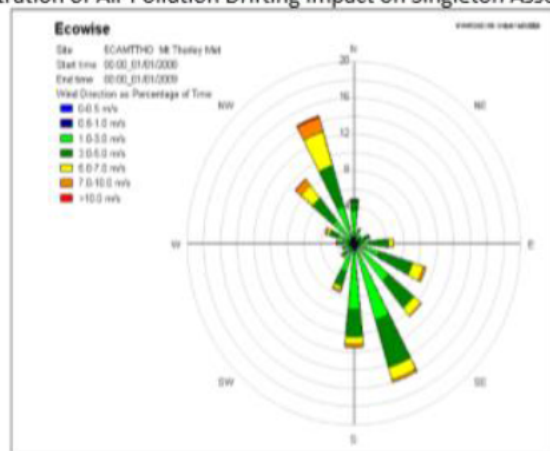


Figure 14: 2008 Annual Wind Rose

Time Averaging has also distorted the understanding of Air Drifting Flow Paths passing across Mines. In this case an Annual Average completely distorts and Hides the actual prevailing conditions, while the actual 15 Minute based Wind Direction Wind Rose would be much more scattered.

SSHEG Rixs Creek Mine Continuation Dec 2015

Note Meteorological Variability

If anything, there are more of the same methods and evaluations of the type that have attracted Community criticism by CCC Members over the years particularly regarding Air Pollution and Blast Plume Drifting Modelling, especially the Variability of Valley Meteorological Conditions, Year on Year; and the **“Time Averaging of Air Pollution Data that destroys its Disease Risk Intelligence”**.

SSHEG is critical of the somewhat selective Meteorological Conditions that are been used for both the Air Quality and Noise Modelling.

The Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (the EPA Approved Methods DEC2005) does however place the onus upon Rixs Creek Mine to make sure that “Data must be representative of the area in which emissions are Modelled”. Data used needs to represent the likely conditions across the 21 years of operation of Mining. This includes the Air Stream Flow Variability across Minutes.

Figure 1 also Illustrate the significant issues faced by Rixs Creek Mine to limit the Airborne Pollution Emissions during the Winter Months (which can extend from July through to late September) when South Easterly Flowing Valley Air is Drifting directly across the Mine Workings and then over close-by Singleton Residents as indicated. Of particular note is the added impact of the Rail line and New England Highway with the somewhat concentrated presence of Diesel Exhausts Pollution, in an area where previous Community concerns of a Cancer Cluster were investigated.

For the Rixs Creek Continuation Project, a significant change is required to strategically locate *“Concurrent PM 10 & 2.5 Real Time Monitors (15 Minute based)”* in each of the Assessment Group in Figure 12.2 above to protect these Singleton Shire Residents.

Such Monitors would provide the basis to **Mitigate Air Pollution by Minimisation** for example by the judicious use of favourable Air Drifting Patterns throughout the Day to avoid vulnerable Resident Groups. Alternatively, Rixs Creek could use a *“Real Time PM Dispersion System”* based on Mine equipment 15 minute activities and local measured Meteorological movements across the Mine Site.

Some indication of the issues to be balanced by Rixs Creek is the impact of the cluster of Mines in Figure 2-2, Ravensworth Mt Owen operations, and close by the development of Aston South, EL5291, Singleton Town spread 1989 -2013, with TSP Dust Gauge Isopleth patterns providing a guide to Air Pollution drifting Paths.

SSHEG Rixs Creek Mine Continuation Dec 2015

Elimination of Mine Blasting Plumes into the Atmosphere

The Rixs Creek Mine Air Pollution entrainment in South Easterly Drifting Flows is further complicated when Mine Blasting is examined.

SSHEG reviews in 2014 ([Attachment 1](#)) entitled “SSHEG Document March 2014 Mining Pollution Mitigation Priority Action” identified Two Compliance Licence Conditions;

- (1) *Elimination of Blasting Plumes into the Atmosphere.*
- (2) *Residents in the Maison Dieu, Singleton Heights, Retreat, Hamilton Hill – Gouldsville _ Long Point Rural Environs to be designated as “Occupational Exposure to Mining Status” concurrently as a Precinct with HVO , Ravensworth – Mt Owen, Integra Mining Operations cumulative “Air and Noise Pollution” requiring “Minimisation NOT Time Averaging to Hide Residents Pollution Exposure”.*

SSHEG concluded “The Elimination of Blast Plumes into the Atmosphere” would be the most significant step that the Mining Industry and Orica etc. could take towards reestablishing a better balance in the Hunter Valley. “*This can be achieved*”.

The Disease and Sickness Risk to Near Neighbours from Mine Blasting in the Hunter Valley, with Mines located amongst Rural Residents, depends entirely on Mining Blast Protocols and repeatable Meteorological Wind to dissipate Toxic Blast Plumes. The reality is that Wind Directions have been known to change direction unexpectedly just after Blasting. A repeat of the SE Qld “Gassing and Hospitalization of 21 Mine workers some Kms from the blast site remain a reality in the Hunter Valley.

We feel that for Open Cut Mining to continue Operating beside Residents in the absence of “Community Buffer Zones” in the Hunter Valley that it is essential that a way forward of Pollution Mitigation be added to existing Mitigation measures that not only reestablishes a better Balance but also is seen by the affected Residents and the Community as establishing that Balance.. However the risk of “Near Neighbour Gassings” demands action.

With the WHO 2013 Disease Risk knowledge that Air Pollution is now known to have “No Safe Threshold”, it is not surprising when Residents see HUGE Blast Dust and Toxic Plumes rising into the air and drifting towards their Homes and are alarmed that their and their Children’s Health may be affected. Should this Plume be bright orange, then it strikes panic and resentment in the vulnerable of the Community, and soon Community Complaints flood the Authorities and Health Warnings are issued. *Refer Photos.*

However the reverse is now also known to be true, where Blast Plume that are colourless and almost invisible are much more dangerous as no visible warning is present. Such an incident was recorded and briefly documented in 2013 as outlined in [Attachment 3](#).

Blast Management Plans have failed by focusing only on the Presence of Nitrogen Dioxide Orange Component in the Blast Plume claiming this is Best Practice Blasting, while the real Danger is from the colourless Gases, Vapours, Particulates and Aerosols as products of the Explosions and Flame emitted from the Blast Holes into the atmosphere resulting from inefficient and ineffective Stemming. “*Better Blast Hole Stemming is Needed*”

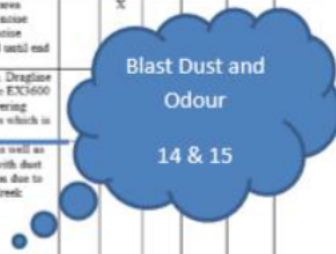
SSHEG Rixs Creek Mine Continuation Dec 2015

These “Mine Blast Gassings” have occurred elsewhere across the Hunter Valley and should have been red flags to Government Authorities and Mining Companies that action was required. The recent “Gassing” of BOC workers outside the MTW Lease area Blast on 20 September 2013 highlights (*Attachment 3*) that notification of Blast time is not sufficient, but rather evacuation of residents within a prescribed range of say 5 to 15 kms in the Predicted Blast Plume Drifting Pathway is a more realistic Mine procedure when Blasting of suspect Strays or during unexpected Water damaged Shots have to occur for Mine personnel safety reasons.

Rixs Creek has not escaped Blast Plumes Drifting off Site and returning to ground nearby, as illustrated



9	18/7/2013	Resident	Rix's Creek Lane	Complaint regarding the sound of shooting at the mine. Kangaroo culling being undertaken. Soil and calm noise must have enhanced noise so Rix's personnel and shooters relocated away from the location of concern.		X			
10	19/7/2013	Resident	Maison Dieu	Complaint regarding operational noise all week and especially night of the 18/7/2013. Weather conditions enhance noise during this time of the year. Mine currently modifying West Pit to minimise		X			
11*	30/7/2013	Resident	Singleton Heights	Inquiry regarding blast in West Pit @ 14:12 pm as to whether Rix's Creek did blast and blast was within its limits. Blast results provided to resident. Resident did not wish to complain.	X*				
12	13/8/2015	Resident	Maison Dieu	Operation noise has been loud in Maison Dieu area especially during winter. Rix's Creek aware of noise issues and has amended West Pit to minimise noise impacts, however, changes won't be completed until end of 2015.		X			
13	14/8/2013	Resident	Maison Dieu	Resident woken at 3am by mine machine noise. Dragline worked during night (usually shut down) due to EX3600 excavator being broken down. Rix's Creek lowering haul road in West Pit to minimise noise impacts which is likely to be completed end of 2015.					
14	21/8/2013	EPA Complaints Line regarding three complaints to EPA regarding a blast	Singleton and Singleton Heights	Complaints regarding dust emitted from blast as well as strong odour. Rix's Creek did conduct a blast with dust cloud remaining stagnant in air for long duration due to low wind speed. Zero flame from blast. Rix's Creek provided report to EPA.					
15	21/8/2013	Planning Compliance Singleton	Patty Road	Complaint regarding large dust cloud being emitted from Rix's Creek mine. Rix's Creek did conduct a blast with dust cloud remaining stagnant in air for long duration due to low wind speed. Zero flame from blast. Rix's Creek provided report to DP&I.	X		X		
16*	18/9/2013	Planning Compliance	Passing site on NEH	Inquiry to Maison Dieu dragline dust in West Pit (surface level) whilst driving past site. Dragline was not				X*	



2

Rixs Creek Blast Fume exposure in Maison Dieu Industrial Estate was the subject of SSHEG (*Attachment 2*) and Singleton Compliance Officers Investigation in 2014 which was inconclusive as some conjecture prevails as to the dissipation of the Blast and the Drifting Path or paths that occurred. SSHEG viewed Mobile Phone Video of a number of blasts with diary notes of respiratory and eye impact, but as proper Technical and detailed Reports were not produced or forthcoming, proper scrutiny and investigations has not occurred. However it is clear that Rixs Creek Mine Blasting does impact Near Neighbours and their Health Safety is only identified when a Complaint is Recorded.

It is therefore incumbent on the Government Authorities and Mines where they should be aware of the “potential Gassing Incidents” to immediately report these events to the Environmental Health and Health, Planning, EPA Ministers who are liable to administer the provisions “under the Act”.

SSHEG Rixs Creek Mine Continuation Dec 2015

Summarising, the Communities concern is the following extract from “*The Maitland Mercury* by Matthew Kelly Nov 4 2013” shortly after the WHO Air Pollution Announcements and Newcastle Air Quality Forum in September 2013. (Notations highlighted in Red relate directly to Rixs Creek Mine SSHEG Health Concerns).

“NSW Health investigated a **suspected brain cancer cluster in the Singleton area in 2010** following long-held community concerns about the health impacts of coal dust.

The investigation, which focused on five cases over a 35-year period, was unable to find a direct link and concluded the cases were a statistical anomaly. It did, however, **suggest the cases and their potential causes were worthy of further investigation.**

Professor Wayne Smith from NSW Health’s environmental health branch said the agency’s statement was accepted knowledge in the field of air pollution research.

“The ... **statement provides additional justification for the actions that the NSW government is taking to reduce the population’s exposure to air pollution**, including the actions being taken in the Upper Hunter,” he said.

NSW Health data, released at September’s air quality forum in Newcastle, estimated **fine particle pollution** resulted in 25 deaths in the greater Newcastle area each year. **Two deaths a year were attributed to exposure to fine particle pollution in Muswellbrook and Singleton.** Fine particle pollution causes 223 deaths in Sydney each year.

A NSW Minerals Council spokesman said the industry was committed to improving air quality. “Mining contributes to regional particulate matter, but we’re one of many contributors. Other sources include cars and other transport, sea spray, bushfires and wood smoke from homes,” he said.”

Two SSHEG Documents provide the background of our engagement with Government Authorities, Hunter Community, Mining and Power Stations over the last ten years.

[Attachment 4](#) is a Presentation of Community Health Concerns 2013

[Attachment 5](#) - SSHEG Review Summary May 2015

- incl Mining Dialogue Summary 2011 – 2014

- Appendix M7 SSHEG Review 2015 Presentation Pgs. 38–40.

SSHEG contend that the Environment in the Hunter Valley, especially with Poor Air Quality from Pollution Emissions of Gases, Particulates, Vapours, Fumes, Aerosols, Pollens, etc., requires better targeted Short Term Monitoring of the Composition, Toxicity, Exposure and related Health effects. By 2014 sees the challenges of the new World Health Organisation “Stochastic” Air Pollution Paradine, requiring better Mitigation steps to reduce these Health Risks for Residents.

But it is especially all children, Pre & Post Natal and Children under 8 years of age that are now being confirmed as one Population Group vulnerable to Air Pollution; confirming the Singleton Community Health Survey Reports. These SSHEG Health Surveys in 2008-9 and Community Reports by 2010 already identified that the Air Pollution of the Cluster of Mines in the Hunter Valley are often Hour by Hour impacting the Health of all Residents Groupings in Bulga-Broke Micro Valley area, Glenden Brook Valley, Mt Royal, Muswellbrook and Singleton Shire, for both Long and Short Term Exposures.

SSHEG Rixs Creek Mine Continuation Dec 2015

Dr Neville Hodkinson PhD

Singleton Shire Healthy Environment Group

- Attachment 1* SSHEG Document March 2014
 - Mining Pollution Mitigation Priority Action
 - Blasting Pages 1 -10.
- Attachment 2* SSHEG “Elimination of Mine Blasting into the Air” April 2014
- Attachment 3* Report on MTW Blast 20th Sept 2013 BOC Workers “Gassings”
- Attachment 4* SSHEG Presentation of Community Health Concerns 2013
- Attachment 5* SSHEG Review Summary May 2015
 - incl Mining Dialogue Summary 2011 – 2014
 - Appendix M7 SSHEG Review 2015 Presentation Pgs. 38–40.