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Centre for Social
Responsibility in Mining

ACARP C22029
Managing Cumulative Impacts
in Mixed-Industry Regions

Upper Hunter Valley Case Study
New South Wales

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1. Context

The Upper Hunter Valley is located in central east New South Wales about 200 kilometres north of Sydney and 50 kilometres north-west of Newcaslte. For the purpose of this report the region includes three Local Government Areas (LGAs) that form part of the Hunter Regional Development Area.

Figure 1: Upper Hunter Valley Region map
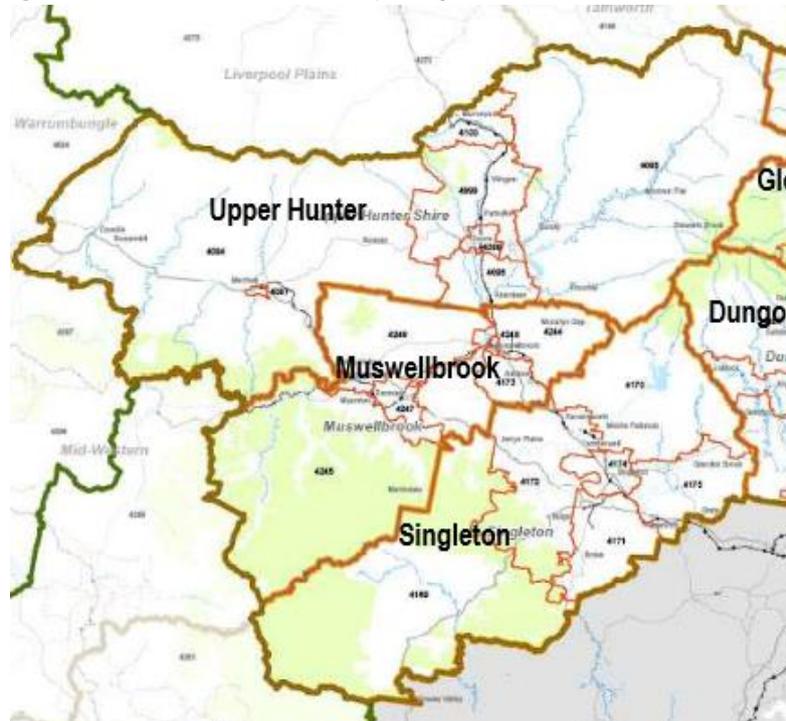
Source: Buchan, 2011

Figure 2: Upper Hunter Valley
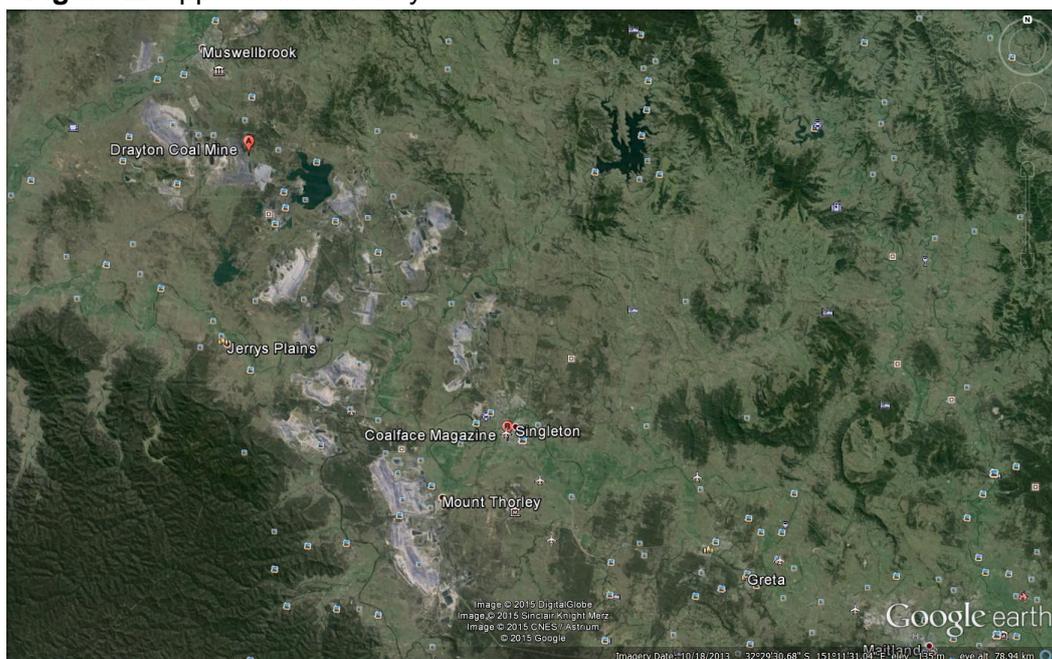
Source: Google Earth, Imagery date: 10/18/2013 32° 29'30.68" S 151° 11'31.04" E elev 135m eye alt 78.94km

The Upper Hunter can be described as a multi-industry region due to its thriving, yet unrelated, industries. The case study focuses on the Upper Hunter region paying particular attention to Singleton and Muswellbrook LGAs, where coal mines are concentrated. Figures 2-4 illustrate the diversity of land usage in the Upper Hunter Valley (Figure 2), with Figure 3 focusing on Singleton and Figure 4 on Muswellbrook. Mixed land-uses include open pit coal mining, cropping land, grazing land, wine vineyards and horse studs. However, it is not all in commercial production as National Parks make up 43% of Muswellbrook shire for example.

Figure 3: Singleton and surrounds
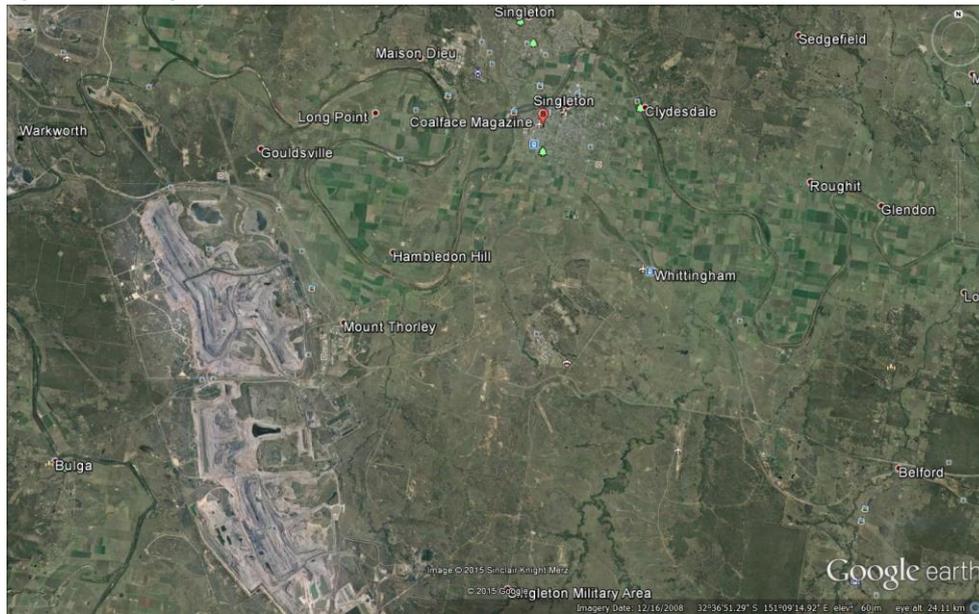
Source: Google Earth, Imagery date: 12/16/2008 32° 36'51.29" S 151° 09'14.92" E elev 60m eye alt 24.11km

Figure 4: Muswellbrook and surrounds
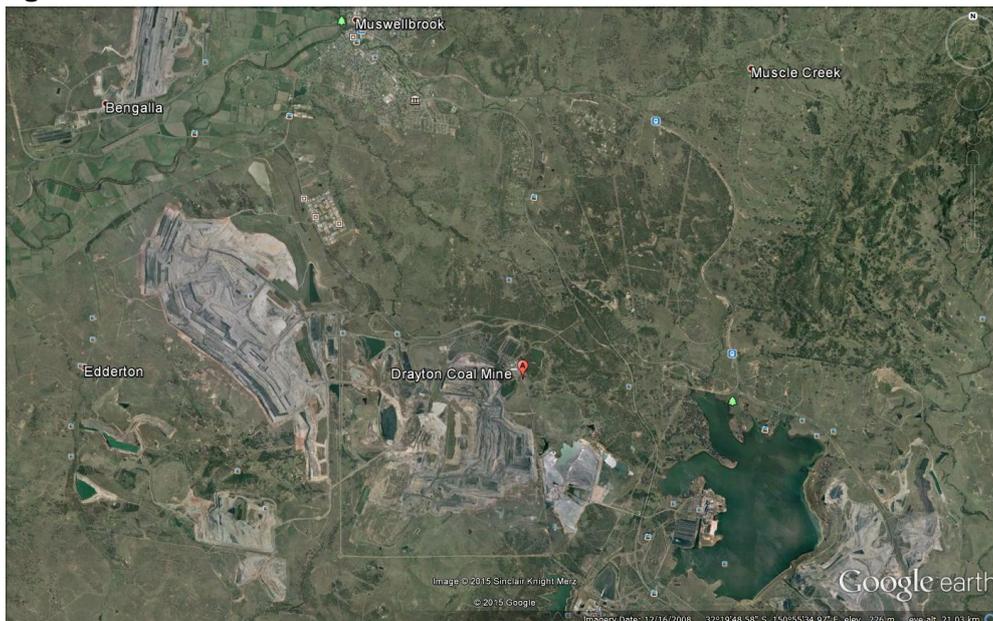
Source: Google Earth, Imagery date: 12/16/2008 32° 19'48.58" S 150° 55'34.97" E elev 226m eye alt 21.03km

The Upper Hunter region has a population of approximately 67,500, with Singleton being the largest of the LGAs with an estimated 23,787 followed by Muswellbrook LGA with a population around 16,673 (Regional Australia Institute, 2013). The Upper Hunter's economy is currently underpinned by the main industries of coal mining, agriculture (particularly dairy and beef cattle production), horse breeding, electricity production, tourism, wine making and associated service industries. Table 1 presents the breakdown of employment and regional output by industry in Singleton, Muswellbrook and the Upper Hunter LGAs. (Remplan, 2103).

Table 1: Main local industries and their impact on the Upper Hunter economy

Industry	Employment numbers (proportion of workforce)	Proportion of regional output (value $million)
Mining	7, 982 (28.1%)	62.3% (12,182.6)
Agriculture, Forestry, Fisheries	2,119 (7.5%)	2.5% (479.7)
Retail	2,116 (7.4%)	1.2% (238.9)
Manufacturing	1867 (6.6%)	3.8% (1650.3)
Construction	1,692 (6%)	4.6% (903.7)
Accommodation & Food Services	1,595 (5.6%)	1.1% (218.6)
Public Administration & Safety	1,368 (4.8%)	1.7% (340.2)
Tourism	1,220 (4.2%)	1.1% (216.5)
Transport	809 (2.9%)	1.2% (233.2)
Electricity, Gas, Water, Waste	793 (2.8%)	5.2% (1009.1)
TOTAL	28,430	19,567.5m

Source:Remplan, 2013
*Upper Hunter Valley Region (Singleton LGA, Muswellbrook LGA and Upper Hunter LGA)

In terms of economic diversity, Singleton, Muswellbrook and Upper Hunter LGAs are considerably less diverse than the Australian average and than neighbouring shires in the Hunter RDA. According to the Regional Australia Institute (RAI) the average Australian region's economic diversification indicator is 1, whereas Singleton, Muswellbrook and Upper Hunter LGAs have economic diversification indicators of 0.24, 0.28 and 0.36 respectively (Regional Australia Institute, 2013).

The prominence of the mining sector is evident in Table 1 and Figure 5. Nevertheless, some of the apparently smller industries are significant for the state and nation. For instance, the Upper Hunter region is known for its energy generation capabilities, providing over 60% of all NSW electricity supply (NSW Department of Planning and Infrastructure, 2012). Other critical industry clusters are located in the region too – as detailed in section 1.1.

Figure 5: Employment by industry*
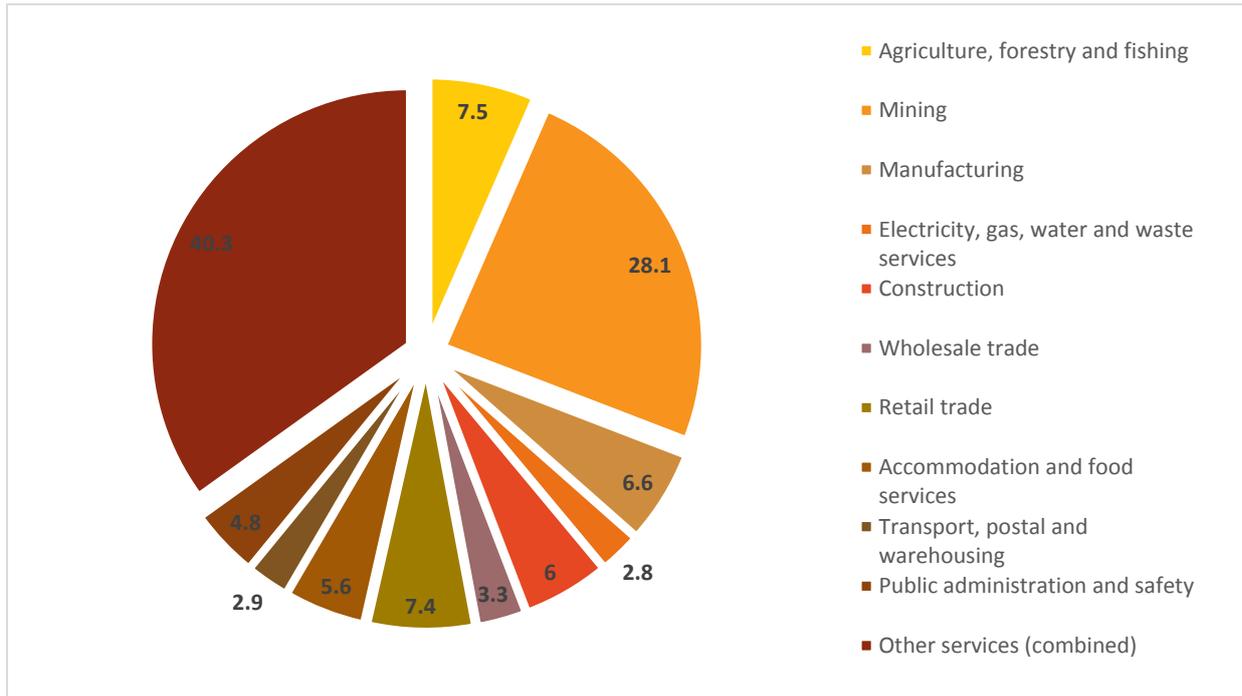
Source: Remplan, 2013

*Upper Hunter Valley Region (Singleton LGA, Muswellbrook LGA and Upper Hunter LGA)

1.1 Agricultural industries in the Upper Hunter Valley

Agricultural activities are supported by rich soils, temperate climate, abundant good quality water and proximity access to large populations. These ideal characteristics have supported agricultural activities in the Upper Hunter since the early 1800s. The estimated value of agricultural activities to the Upper Hunter regional economy in 2006, was AU$ 5.9 billion a year (NSW Department of Primary Industries, 2013) and these industries provided over 3,200 jobs. Grazing is the region's dominant agribusiness sector in terms of employment, area involved and overall economic returns (NSW Department of Planning and Infrastructure, 2012).

The thoroughbred horse breeding industry, established 150 years ago, is concentrated around the town of Scone in the Upper Hunter Shire and has grown to be one of the major horse breeding areas in the world, contributing over AU$ 2 billion to the NSW state economy annually (NSW Department of Primary Industries, 2013) – the contribution to the economy being significantly more than the value of output given indirect and multiplier effects. Upper Hunter horse studs produce 80% of the total value of stud horses exported by Australia (NSW Department of Primary Industries, 2013).

The wine industry boasts similar success with a strong and expanding base in Singleton and Muswellbrook LGAs due to proximity to Sydney and the vineyard tourism market. Wine grapes estimated agricultural yearly value in the Upper Hunter was above AU$ 24 million (NSW Department of Primary Industries, 2013). Tourism, largely driven by the wine industry provides an estimate of AU$ 1.3 billion to the Hunter economy as a whole.

While all of these industries modify environments, draw on regional assets and can degrade them with certain practices, when practiced sustainably, they essentially have an indefinite lifespan.

1.2 Coal mining in Singleton and Muswellbrook, the Upper Hunter Valley

Coal mining is the other prominent industry in the region and the only finite industry with each mine having an estimated 25-30 year lifespan on average. The industry has however been in the Upper Hunter Valley for over 150 years since underground mining commenced in the mid-1800s (Hunter Valley Visitor Centre, 2014). Back then mining took place predominantly underground and at a smaller scale, with the prime impact being subsidence. Technological advances coupled with a growing demand for coal have resulted in an increase in the number of mines – and especially open cut mines – being established around the Muswellbrook and Singleton townships (Muswellbrook Shire Council, 2012) to access further deposits. In 2010, the NSW Minerals Council claimed, "*The Hunter Valley Coal Chain is made up of 14 coal producers, 35 mines, 24 rail load points, and 15,000 loaded rail trips each year, ending at the Port of Newcastle*". The exact number (of producers, mines etc) has changed, but the industry still has that ssignificant presence in the region . More recently, there were 17 coal mines in these two shires of the Upper Hunter Valley region (NSW Minerals Council, 2013), with large national and multi-national companies presently operating, such as AngloAmerican, Westfarmers Resources, BHP Billiton, Glencore Xstrata, Idemitsu Australia Resources, Peabody Energy and Rio Tinto.

The growth of LGAs, such as Muswellbrook and Singleton, has been largely influenced by the development of open cut coal mining. The value of output and of the contribution to the local economy for any industry differ. Nevertheless, coal companies contribute AU$ 924 million to Singleton and AU$ 562 million to the Muswellbrook economy (NSW Minerals Council, 2014). These large direct contributions are in the form of wages (with 12,000 people employed in this industry in the region), and direct spending on goods and services, as there are a range of companies who cater to the mining industry such as engineering, construction, transport, logistics and human resources. Additionally, Muswellbrook and Singleton receive the largest return of royalties under the NSW government's Resources for Regions scheme, with Singleton receiving AU$ 500 million and Muswellbrook AU$ 275 million in 2012-2013.

2. Methodology

The case study reported here is one of three compiled as part of a larger study examining recent initiatives intended to manage cumulative impacts of coal mining in multi-industry regions like the Hunter Valley of NSW. It involved targeted consultations with key stakeholders from different sectors to evaluate the effectiveness of these in the eyes of these practitioners. The Hunter Valley was chosen as a case study to allow investigation of the evolving regulatory regime in the major coal mining state of NSW and the application in practice in a long-standing and intensive coal-mining region that also hosts other industries.

2.1 Participant consultation

A range of relevant participants was identified by desktop research, and/or recommend by other participants and invited to participate in one-on-one or group interviews by telephone.

A questionnaire consisting of NSW and region specific questions was sent to assenting participants (see appendix). The questionnaire was composed of several open ended questions that sought to explore participants experience and assessment of recent legislation, policy and practice changes intended to manage the cumulative impacts in their region. A list of measures, sourced from Phase one desktop research, was also presented and participants were asked to mark the ones they have had experience with and rate their effectiveness from 1 to 4. All interviews were confidential and followed The University of Queensland's ethical guidelines.

Thirteen phone interviews were conducted with participants in the local economy or with responsibilities for impact management in the Upper Hunter Valley region, specifically Singleton and Muswellbrook LGAs. Interviewees were selected as informed people from the sectors with a stake in the management of coal industry impacts. In the case of the single civil association spokesperson this organisation has publicly criticised the industry and serves to give a counter-perspective. The breakdown of the participants is shown in Figure 6. The sectors represented among the interviewees were:

  ➢ State government (2)
  ➢ Local government (2)
  ➢ Mining industry (6)
  ➢ Other business and industry (2)
  ➢ Civil associations (1)

Figure 6: Interviews by stakeholder group
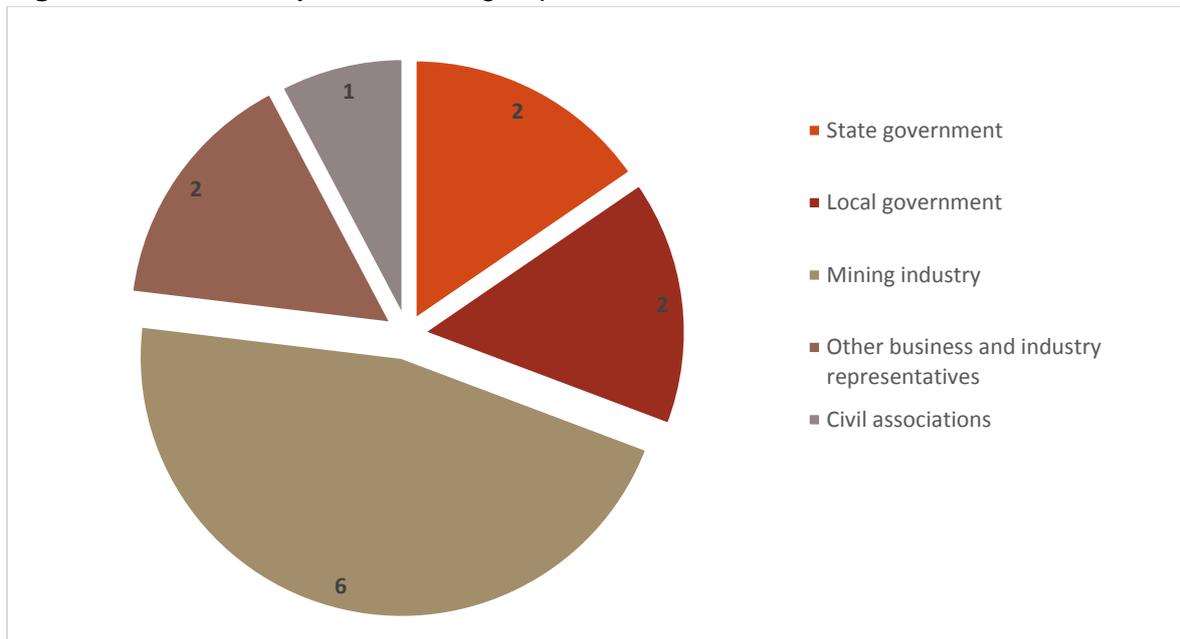
Interviews sought participants' views on cumulative impacts in the Upper Hunter valley region, the role they play in addressing such impacts, how they are applying various assessment and management processes and tools in practice and views on the effectiveness of the measures. All information was analysed in order to identify patterns, and dominant trends.

3. Main impacts with cumulative dimensions and related measures or legislation

3.1 Environmental

3.1.1 Catchments and Aquifers

Although water resources were identified as a crucial resource, it generally appeared to be an uncontentious issue suggesting that it was regarded to be well managed. Participants did not flag catchments as being particularly impacted cumulatively by the coal mining industry and companies seemed to consider that mines impacted only if they discharged directly into streams.

Likewise, participants did not mention aquifers being impacted by cumulative coal mining impacts in particular, although they highlighted their reliance on aquifers and the severity should any potential impact occur. A business sector participant felt there were '*nowhere near enough water collection/retention practices in place*' (Other business and industry 1). In combination these factors worried a civil association member who explained '*Upper Hunter is quite a dry area, rainfall is 500mm a year (Sydney is 1,300mma year) and many farmers depend on the bore water. No one quite knows the full impact of mining on them*' (Civil association).

Measures to assess/manage cumulative impacts on water

No measures addressing water supply (quantity) issues were raised in interviews, but the Upper Hunter Mining Dialogue (discussed later) contributes to management of this impact and two other approaches to assessing and managing cumulative impacts on catchments and/or aquifers were mentioned.

(a) Amended SEPP (mining) standards for water pollution

The State Government's Amended SEPP (State Environmental Planning Policy) for water pollution standards was not seen as an effective cumulative impact assessment tool by participants as it only assesses individual mines.

(b) Hunter River Salinity Trading Scheme

The Hunter River Salinity Trading Scheme, on the other hand was seen as positive by the majority of participants because all industries had to work collaboratively. Further, Hunter River Salinity Scheme is regulated by the EPA and this made industries involved see the process as independent, encouraging them to participate and cooperate (Mining industry 4).

3.1.2 Biodiversity

Recently much more attention is being paid to biodiversity and habitat preservation at state level (as well as through the Federal EPBC Act) as matters that are impacted cumulatively. In this regard, the NSW government highlights the need to have connected natural habitat locations/ 'corridors' large enough to preserve fauna/flora and insists all industries, including both mining and farming, abide by biodiversity plans. To conduct biodiversity studies, the NSW government follows a uniform methodology, for all applications. The responsible department is funded 50-50 by government and the companies submitting the projects for approval. The companies benefit because this fulfils their requirement for a bio-diversity assessment in the EIS. In assessing the applications, the NSW government participant refers to the biodiversity study before granting approval (State government 2).

A local government participant also stated that '*Mining is the industry that most affects biodiversity because it occurs where resources are – [whereas] other industries are clustered in industrial areas*' (Local government 1). Company rehabilitation plans were criticised on the basis that they did not consider a broad enough landscape scale, and scope of functions '*there is a need for bigger picture thinking on rehabilitation rather than simply returning it to farming (grazing)*' (Other business 1). These sentiments were also echoed by an LGA participant when discussing closure conditions, '*companies have to think about the future of the land. Zero consideration is taken by mining companies on how their land will be used in the future. NSW Minerals Council is doing grazing ground trial for effective rehabilitation options but can they prove it will be a viable enterprise in the future?*' (Local government 1).

Measures to manage cumulative impacts on biodiversity

(a) Other than participants from the coal mining industry, those interviewed were not aware of the Federal Government's **Environmental Protection and Biodiversity Conservation (EPBC)** regulations or related measures such as world and national heritage protection, and how these operated for instance for threatened species protection. Company personnel mentioned that measures requiring approvals at both a federal and state level were not ideal (Mining industry 3) so moves for bilateral collaboration between different levels of government were welcomed. As well the EPBC regulation was regarded as very broad and lacking a specific cumulative focus for the coal mining sector.

(b) In contrast, a more recent initiative, the **Biodiversity Plan for Coal Mining in the Upper Hunter** and the strategic assessment of it were seen by most participants as promising to be effective in evaluating the impacts of a program to identify and protect biodiversity in the Upper Hunter Valley, including matters of national environmental significance protected under the EPBC Act and threatened ecological communities and species protected under the NSW Threatened Species Conservation (TSC) Act. The biodiversity plan was established three years ago and has involved the NSW Environment and Heritage Department introducing uniform methodologies for assessing cumulative impacts on biodiversity in the form of assessments and certifications, called BioBanking Assessment Methodology (BBAM) and Biodiversity Certification Assessment Methodology (BCAM). The NSW Environment and Heritage Department is in charge of conducting the strategic biodiversity assessment used to assess EISs with half of the funds provided by companies. A participant from a mining company was very positive about this process, because of the benefit in having a uniform methodology (Mining industry 5).

A NSW state government participant explained the biodiversity plans tried to look through the whole life-of-mine and respond to community visions, '*so the whole of the Upper Hunter region could have more of a say when deciding what they wanted the landscape to be in 20 years' time. Communities do not only want mine rehabilitation to entail grass*' (State government 1).

3.1.3 Air quality (dust and airborne emissions)

Air quality (affected by dust and airborne emissions) was highlighted as a key cumulative impact by all participants because of the multiple mines in close proximity to each other and to towns. Air pollution was flagged as a major health concern and complaints regarding dust were said to be the most common concerns raised with operating companies in the area as

this is a visible impact on communities. Mining industry participants stated that air quality was an area of frustration because of the difficulty of managing it due to changing winds and atmospheric pressure – highlighting that interactions between emissions and exogenous factors are complicating factors in managing cumulative impacts. Mining industry also raised the point that there are other industries in the area that produce dust and air pollution however it is always attributed to the mines. Power stations are one example and another identified in a 2013 study is wood fires for home heating, which is a growing concern in NSW (Commonwealth of Australia, 2013).

> *'The cumulative impacts in the region, particularly air quality, are always attributed as a mine related issue, when the reality is the biggest air quality issues is wood smoke from house fires in winter, yet that never seems to get much attention. It is quite unjust, and the media is not interested in this unless they can lampoon the industry. Yet the industry personnel are not the people to be raising this issue because of course it would be seen as reflecting any negativity that comes our way'* (Mining industry 4).

A civil associations participant was concerned that the cumulative impacts of coal dust on air quality were not being addressed properly because of the '*nature of the industry and the inability of the authorities to put in controls to make sure the impact is minimised*'. (Civil association 1).

Measures to assess and manage cumulative impacts on air quality
(a) As an attempt to resolve air quality concerns the **Upper Hunter Air Quality Monitoring Network** was created (Upper Hunter Air Quality Monitoring Network website, 2014). This was seen as an effective initiative by all participants. Some reasons given for this were because it had:
   - Good governance and was run by the EPA
   - Representation from varied stakeholder groups in the steering committee
   - Public transparency with up-to-date information and outcomes available on the EPA website
   - Clear, evidence-based performance standards
   - The definition of an action response associated with exceeding threshold limits with companies obliged to shut down their equipment when dust emissions exceed maximum levels.

   This sentiment is evident in the words of a civil association participant, '*you can see the monitors in your computer, and alerts are issued when the dust exceeds set levels. You can also sign up and get alerts sent directly to your mobile phone*' (Civil association 1). Despite these generally positive reviews, a few participants expected better results. For instance, some participants pointed out that although air quality monitors are not only triggered by mining operations problems detected are largely attributed to them. In this vein some mining industry personnel drew attention to a report showing that the Upper Hunter has other industries which contribute significantly to dust emissions as well as home woodfire heating in winter (Mining industry 4). Also, some participants see linking action strategies to exceedences as reactive since the dust has already been produced and carried by the wind (Civil association 1). A third criticism related to the fact that monitors focus on particulate matter and when they detect other air pollutants lack the

ability to distinguish sources such as of carbon dioxides from the diesel fumes produced by machinery used in mining and other industrial operations, which can also have an impact on the communities' health (Civil association 1). Some participants noted that work is continuing in this area through the Emissions and Health Working Group under the Upper Hunter Mining Dialogue (see below) which has other relevant industries such as Macquarie Generation (now AGL) involved.

b) The **NSW Health Development Assessment Guideline on dust emission thresholds** was seen as ineffective by some participants because of the disparities between this guideline and the EPA's guidelines applied in the Upper Hunter Air Quality Monitoring Network. As a mining industry participant explained, '*you have the EPA's position on air quality and impacts on communities' health, and then you have the Department of Health forming a different position, and coming from a different perspective. That is a pretty contentious issue in the valley*' (Mining industry 2). This sort of inconsistency across government departments in relation to dust and other matters has created confusion among companies and communities alike when it comes to important issues associated with managing cumulative impacts such as determining risk and consistent performance standards.

c) A related measure, the **Upper Hunter Air Particles Action Plan**, outlines a range of measures in place or being developed by the NSW governmemt to improve air quality in the Upper Hunter, with a focus on coal mining particle emmisions. These include actions to engage communities, improve planning decisions, reduce particle emissions from coal mines and other sources and improve the evidence base for action through monitoring and research. It was seen as effective by some participants because '*it makes mining operations look closer at what they are doing*' (Mining industry 6). However, it is viewed as too focused on coal, with a participant from the mining industry highlighting it would be more effective for cumulative impacts if they had a broader scope (Mining industry 6).

d) The state government also has an **amended SEPP for air quality and noise** which, like its water quality counterpart, was not seen as effective by the majority of participants. This was partly because the standards are couched to act as guidance only for developers on the operating standards they should aim to achieve. They are not prerequisites or the conditions the consent authority will apply (which could be more or less rigid depending on context) (State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries), 2013). Consequently an critical interviewee from a civil association rejected it as '*a disgrace*' because although *'it sets maximum and minimum standards, the inability to meet these standards does not qualify as a reason to stop the approval proceedings*' (Civil association 1).

Besides these formal measures, in an attempt to alleviate dust emissions, there are informal interactions between companies in the area such as warning each other about gusts in wind that may exacerbate air quality concerns (Mining industry 4). Additionally, mining companies also conduct predictive meteorological and air dispersion modelling and real time air quality monitoring, with the findings about high risk days/ periods shared among neighbouring mines. A variety of such measures are used to guide the day to day planning of mining operations and implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of the consent.

3.2 Community and Social

3.2.1 Housing

Housing supply and affordability was raised as an area where the interaction of various operations amplifies the negative impacts such as those associated with the boom-bust cycle typical of the coal mining industry. When mining is in an upturn as in 2012, all companies seek to accommodate extra workers and responses include increasing housing stock. More recently, the downturn in the mining sector means reduced demand and consequently additional housing infrastructure is now surplus to requirements. A business sector participant explained than in past years '*high house prices and rents forced lower income earners out of town and dramatically reduced the opportunities for our young to find accommodation, which saw the town lose our bright young kids*' (Other business and industry 1). Although the downturn in mining has made more accommodation available, this too has created a different social problem, as expressed by a local government participant, '*prices went up during construction, they are now down, so people who built houses have them either empty or are renting for very low, which has deteriorated neighbourhoods as low socio-economic people have moved in*' (Local government 1).

3.2.2 Social Infrastructure

Social infrastructure facilities have experienced similar cumulative impacts from the mining downturn. For instance the loss of residents who were once contracted in the mining sector leaving town in search of employment impacts the service levels provided in schools, hospitals and other social services. A civil association participant voiced that '*schools have been mostly impacted by the downturn in mining due to the departure of students*' (Civil association 1). All participants suggested such impacts could be mitigated by greater planning around infrastructure , with a business sector participant adding, '*more planning is needed well ahead of time, this has been seen in the construction of Hunter Freeway, which has had a positive effect, but could have been more beneficial when the boom was happening*' (Other business and industry 2).

Such advance planning could take into account likely fluctuations in the pressures on social infrastructure. For instance, the downturn has brought an easing of the strains for services which were at full capacity during the boom years. A participant from a local government explained,

> '*Now there is less strain because the numbers of students and children are dropping, so there is less stress in childcare, before you had to be on a 6 month waiting list. Health services are also less strained although they keep saying they are struggling*' (Local government 1).

Nevertheless some impacts are not temporary and linked to commodity cycles. An example given was participation in sports club and volunteering associations which has dropped to the dismay of all participants. This was seen as a cumulative impact of the mining industry since employees work in 12 hour shifts leaving little time to participate regularly in after work activities (Local government 1).

Resources for Regions was seen as a largely effective initiative by the NSW government to address impacts on infrastructure in mining regions by funding projects prioritised by LGAs. Mining companies do not have any input into the allocation of state funding, however they can lobby on behalf of civil groups' applications (Mining industry 4). Criticisms of Resources for Regions mostly concerned the lack of clarity about eligibility criteria for funding. A participant from the mining industry explained, Resources for Regions '*could be great but there is no clear criteria for regional infrastructure eligibility. Hospitals have been putting applications yet until now LGAs and childcare facilities have been the only ones successful in securing funds*' (Mining industry 6).

The state government has another measure to handle cumulative impacts both in removing the need to establish direct links between a development and increased demand for public amenities and public services as well as cushioning some of the unpredictability associated with resource projects.Section 94A development contributions plans of the EP&A Act authorises the imposition of a levy which is calculated as a flat percentage of development cost, and does not require any connection between development which pays the levy and the object of the expenditure of the levy.

The industry initiated Upper Hunter Mining Dialogue has a Working Group on Housing Research that has been investigating further potential action with respect specifically to housing infrastructure impacts.

3.2.3 Noise, Air pressure, Ground vibration and Visual amenity
Blasting and associated noise, pressure and vibration were high concerns for companies and communities alike, with mining companies stating this prompted large numbers of complaints from nearby residents.
One LGA coordinated a blasting schedule for companies in order to minimize the impact. At first, the local government participant explained, '*companies objected to this coordination, but now some have embraced it and there is a website to notify of blasts*' (Local government 1). This provides an example of simple coordination by a third party serving to reduce cumulative impacts.

Because of various management strategies and other factors, noise is a lower priority in the larger towns of Muswellbrook and Singleton. However, for landholders and those living in settlements very close to the mines, noise was flagged as a major impact. A Bulga resident explained that mining companies do try to minimise their noise impacts and have set up noise monitors near the town. However, with mining machinery operating 24/7, there is still a high impact (Civil association 1). A local government participant added that noise impacts on health, amenity and psychological well-being of residents (Local government 2).

A somewhat related issue that was highlighted was the visual and cultural aesthetic of coal mines and associated infrastructure and landscapes in the Valley. Other industries – especially tourism and horse-breeders, as well as the general public feel this impact has exceeded a threshold of acceptability especially given the proximity of mines to settlements.

Measures to assess and manage noise, air pressure, blasting, visual amenity
See section 3.1.3 above

3.3 Economic and Administrative

3.3.1 Land uses and other industries

The many industries in the Upper Hunter region do not complement each other in terms of resources needed, as they all utilize the same resources, including land which has created grave land use management challenges (State government 1). Local councils typically manage land use issues but a local government participant explained that for mines '*permits are given in such a way to companies that it prevents the council rom serving the town needs*' (for example for adequate Sewage treatment capacity) (Local government 1). The competition for land has been played out most prominently in the media between thoroughbred breeders and a mining company, as breeders feel the close proximity of the mine may impact on their livelihoods.

In regards to coal seam gas, NSW regulation states that coal and coal seam gas cannot be present in the same tenement. Some mining industry participants viewed this as counterproductive and suggested NSW should adopt QLD regulations on this matter, which permit both resources to coexist in the same tenement.

The expansion of some operations in the Upper Hunter Valley has created concern among nearby residents, with a business sector participant highlighting '*mining operations are getting closer to villages, villages such as Ravensworth, Warkworth, Camberwell and Bulga*' (Other business and industry 1). A civil association participant, who is actively opposing the expansion of the Warkworth mine in Bulga, explained,

> '*We think there should be areas of zone protection for communities. Why don't we tell the companies they can't come within 8km of a village? Then the village knows they are safe, the mining companies know this so they don't waste time and resources on applications and research. It is very unclear as to the limits government is placing on mining companies*' (Civil association 1).

The impacts on land uses don't just relate to the operational phase of mining. Post closure land uses were flagged as highly constrained by cumulative impacts (Local government 1 and 2), a sentiment echoing section 3.1.2 Biodiversity. Closure conditions primarily relate to the viability of the land for subsequent uses and, it was argued they should take more into account more options than solely converting former mining operations into grazing land for livestock (Local government 1). Other viable options for the land that are in line with the strategic vision of the region should be explored. A local government participant went on to say,

> '*Companies are doing a bad rehabilitation program and this adds to the problem. Companies have to think about the future of land, if they sell it to a farmer, how will it work? There is zero consideration by mining companies of how their land will be used in the future. NSW Minerals Council is doing grazing ground trial for rehabilitation options and they are effective, but can they prove it will be a viable enterprise?*' (Local government 1).

Measures to assess and manage land use conflicts

a) Despite arguing for better planning as an important strategy in managing cumulative impacts of all kinds, participants from all sectors said that the current **Strategic Regional Land Use Plan** was flawed. One problem was that it varied significantly from people's expectations based on the draft plan circulated previously. A civil association member expressed, 'I was happy with the original plan out for review, but the one they put forward changed, it is a disaster' (Civil association 1). A local government participant voiced similar concerns, 'I was very involved and participated in the development of the plan, yet what we thought it to be and what it was greatly varied' (Local government 2). Another critic of the plan highlighted its narrow focus on agricultural land and water (Mining industry 6), with a local government participant adding that it lacked a holistic approach, in particular when dealing with issues like housing (Local government 2). Another criticism was that the document relied heavily on the communities' perceptions instead of the issues themselves (Mining industry 6) which reveals a perennial problem in using consultative planning approaches to manage issues where conflicting interests need to be balanced.

b) Another measure the government has introduced to deal with land use conflicts is **critical industry clusters**, which identify areas of importance within the Strategic Plans. This received mixed reviews although it was seen as a positive measure by most participants, especially compared to the alternative 'no go areas'; as a mining industry participant explained,

> *'From a planner's perspective I like the idea of critical industry clusters as opposed to putting 'no go areas' in Strategic Plans. No go areas do not serve anyone's purpose, but identifying areas of importance within Strategic Plans makes sense'* (Mining industry 3).

However, there was criticism of the grounds for designating a critical industry cluster and determining the relative importance of different industries (Mining industry 6). In particular, one mining industry participant suggested that mining should be considered a critical industry cluster, especially taking into account the revenue they bring to the region. The participant went on to say each industry should have to consider its impacts on others, '*We have to assess other industries, but they don't have to assess [impacts on] us*' (Mining industry 4).

Mining companies in the area expressed the challenges posed by some members of the thoroughbred community. Overall participants supported the coexistence of these two industries, and thought that the position taken by a few thoroughbred breeders was a bit extreme, especially suggestions that all of these thoroughbred businesses would leave the region if one specific mining expansion is approved.

3.3.2 Local labour force

Impacts on the local labour force were classified as a high impact by the majority of participants. The main cumulative impacts arose from mining companies attracting most skilled labour in the region because of the high wages they pay. This was seen as out-competing other local industries in the region and reducing the labour pool available to them. A participant from the business sector explained,

> *'Coal has created a 'brain drain' for local businesses. All the local 'good people' are sucked into the mines because of good wages. Manufacturers in region cannot compete with the salaries offered by mining companies. Manufacturers train apprenticeships and after they have completed the traineeship they prefer to go work for mining, this is a waste of money and time for manufacturers'* (Other business and industry 1).

Apprentices, tradespeople and professionals with industry-relevant training were not the only ones leaving other employers for a job in the mining sector. This was also the case for professions not linked to the industry, as mentioned by a business sector participant '*even highly qualified engineers, teachers, vets, etc. will end up driving a truck!*' (Other business and industry 1). A participant from a local government added that many people from the council have left to work at mining companies (Local government 1).

A few participants also brought up the positive impacts of having a large residential labour force in the region, as opposed to places in other states with a high FIFO workforce, such as Moranbah in QLD. A mining industry participant emphasized there is greater government support for infrastructure and social services when having a larger residential workforce,

> *'A positive impact of mining is that the bulk of people are residential, so with mining comes a large residential population, local employment and government investment on facilities, like health services, education institutions, etc.'* (Mining industry 2)

3.4 Other impacts raised

3.4.1 Social fabric
Shift work was seen by participants as the greatest impact on the social fabric of communities. Because mining sites operate 24 hours a day, shifts are predominantly 12 hour work days for the manual and operational workforce, leaving little time for workers to spend time with their families or engage in community activities. The 12 hour shifts do not take into account driving or commuting times, which may mean the hours away from non-work activities rise significantly. A participant from the business sector listed a number of issues that were exacerbated by shift work, '*community ties, sport, family life (scary family break up figures), personal health (fatigue), and mental health*' (Other business and industry 1).

3.4.2 Economic benefits and economic disparities
The economic benefits stemming from the presence of mining in the Upper Hunter region were ranked by all participants as highly positive. High economic flows from the mining industry were mostly attributed to procurement, taxes and wages. As a participant from the mining industry itself said,

> *'Certainly there is a strong economic benefit that flows from having a strong mining presence in the region and our economic data tells us there is a strong linkage. In terms of flow on economics there is a high number of mining manufacturing services in the region'* (Mining industry 2).

Some mining industry participants highlighted that communities sometimes take for granted mining's economic benefits and focus solely on the negative social and environmental impacts. The dissemination of information about positive economic mining impacts was seen as a solution by mining industry participants, although there was a sentiment of wariness about doing this as mining companies do not want to be perceived as 'blowing their own trumpet'.

However the cumulative economic impacts were not all reported to be positive as the creation of a two tier economy was raised by the majority of participants. Disparity between wages in the Upper Hunter has created 'haves and have nots'. The high resource industry wages (and demand) has seen an increase in higher rents and retail prices in the region, with lower-waged people, not working in the resources industry, '*feeling the pinch*' (Other business and industry 1).

The cyclical nature of mining and the current downturn further contributes to the two tier economy. As companies slow down production or close operations the mining salaries many were accustomed to are dwindling. A participant from a local government said that a '*two tier economy creates anxiety and tension' among residents and the mining workforce*' (Local government 1). Another of the negative effects of the mining downturn experienced in the Upper Hunter is the workforce having to move to follow mining jobs and high salaries. As they mostly relocate to remote mining regions, their spending is withdrawn from the local economy (Local government 1).

Businesses, both directly and indirectly dependant on the mining sector, are also affected by the cyclical nature of the coal industry. As a participant from the business sector describes, '*the boom and busts happen quickly and business and real-estate are always lagging behind. Currently, because of the bust, there has been a knock-on effect on other industries in the region, particularly retail*' (Other business and industry 1).

The two tier economy was mostly attributed by participants to the heavy reliance the Upper Hunter has on coal mining. All participants agreed that further industry diversification and entrepreneurship were needed in the region to buffer the communities against the ill-effects and maximise the benefits.

Measures to assess and manage cumulative impacts on the economy
a) **Cost-benefit analysis** is voluntary and is frequently employed during the EIS and approvals stage. It was dismissed by many as an ineffective cumulative impacts tool because it solely assesses the cost and benefit of a specific project at a point in time (Mining industry 3) and generally in terms of monetary value. This does not require companies to assess their operation cumulatively, and there is no need to assess nearby operations. However, companies appreciate a comprehensive cost-benefit analysis that identifies non-monetary impacts and see them as necessary with all company participants saying they use these for their own internal analysis even though they are not mandatory. A mining industry participant explained that they are also used in promotions,

> '*We do our own internal cost-benefit analysis, and for our operation we made it public. We made public the contribution the operation has in our local*

economy – people employed, royalties, local procurement – and not all stakeholders liked it. Yet it is beneficial to get information across to the community. Recently our media campaign includes some of that information (cost benefit, input to the economy), to show the community how much we benefit them, although not all believe it' (Mining industry 4).

Because of such campaigns, stakeholders are often sceptical about cost-benefit analysis being used as a 'spin' tool with the facts getting lost. A participant from a civil association expressed other reservations too, because '*there are things that are difficult to quantify, like the loss of the Woodlands or of the town of Bulga*' (Civil association 1), which make the cost-benefit analysis a limited way of capturing impacts.

b) **The Gateway Process**, is designed to serve as a checkpoint to ensure that the proposal submitted by the applicant is justified before further studies are done and resources are allocated to the preparation of a plan. The NSW government presents a report that provides a snapshot of the progress of a project. Where appropriate the report includes recommendations to strengthen the project. The process was regarded by some as an ineffective measure because of its lack of relevance and 'lack of teeth' or limited authority. A participant from a civil association expressed,

> *'The gateway process would fall under the category of a joke! It was originally established for a scientific body to assess a project and recommend whether it should proceed or not, but in NSW it can only recommend conditions and cannot say no to a project. So what is the point?'* (Civil association 1).

c) **Social Impact Analyses (SIA)** are voluntary in NSW though SIAs are routinely prepared when conducting an EIS. The SIA is used by many companies internally as a basis for formulating action plans, however, the majority of the participants interviewed argued it should be a legal requirement imposed and regulated by the NSW state government. Participants favoured a model used, until recently, in QLD where companies had to submit both an SIA and a Social Impact Management Plan, which included monitoring and planning benchmarks for the future (Mining industry 2). A participant from the NSW state government added,

> '*I have worked in both states and NSW is not nearly as advanced as QLD in regards to their social impacts policy. There are really big gaps in NSW. They tend to focus on social amenity impact of environmental issues (noise, dust) but they have not created guidelines/or frameworks/or policy on social impacts for us to follow. In terms of how you manage companies' infrastructure contributions guidance on social impacts from the government would make it easier to navigate the planning agreement'* (State government 1).

3.4.3 Multidimensional impacts

Participants observed that some impacts are multidimensional in the Upper Hunter region, such impacts include changes to their social fabric and the overall effects of the 'boom and

busts' of mining due to the volatility of coal prices in the international market. There was a feeling expressed that it didn't make sense to tackle these issue by issue

Measures to assess and manage multidimensional impacts

a) **The Upper Hunter Mining Dialogue** was seen as highly effective by the majority of participants interviewed as a way to tackle multidimensional impacts. Mining companies, government and other organisations all form part of the Mining Dialogue, creating a forum of diverse positions. It is coordinated by the NSW Minerals Council and is composed of various working groups that study specific impacts raised at the Mining Dialogue in a more coordinated and holistic way.
The working groups include:
   * The Water Joint Working Group
   * The Land Management Joint Working Group
   * The Emissions and Health Joint Working Group
   * The Social Impacts and Infrastructure Working Group

A NSW state government participant highlighted that the Mining Dialogue had done a great job in bringing industry and other stakeholders together (State government 1), which has been positive because it has created an understanding among different stakeholders, including community groups who were once very anti-mining and have now become more neutral (Other business and industry 2). A mining industry participant added that they saw it as an effective tool as mining companies could engage with community and get feedback on priority issues (Mining industry 4).

However, there were some reservations about the Upper Hunter Mining Dialogue, with a few participants highlighting that if the exercise did not build more momentum its effectiveness could wane (State government 1). Some participants also mentioned the Mining Dialogue focused too heavily on housing, something mining companies cannot do much about (Mining industry 2), and that had lost importance with the downturn of the mining industry. Lastly, a participant from the business sector observed that participation in the Mining Dialogue was limited to a few community stakeholders as, '*most business people just don't have the time to attend and they trust the region will take care of things but sometimes the process gets jaded as the loudest voices are the ones heard*' (Other business and industry 2).

b) **The Hunter Regional Plan** was another planning instrument that was seen as addressing multidimensional impacts. It was categorised by most participants as ineffective because it included both the Lower and Upper Hunter in its assessment. Indeed, most participants criticized the plan for focusing more on the Lower Hunter, creating a visible need for an Upper Hunter Regional Plan that would address cumulative impacts around the volatility of the mining industry – such as housing availability/prices, labour shortages in mining and other industries, two tier economy, among others. This sort of plan would create a 'road map' which would spell out the direction the region wants to take in multiple respects including infrastructure, economic and social development, and it would influence the allocation of economic benefits from mining royalties to such ends.

c) In a similar vein, there was strong support for a strategic Upper Hunter 20 year infrastructure plan voiced by most participants. They favoured a plan that could more specifically address the issues for the Upper Hunter related to the highs and lows of the coal industry and guide infrastructure development there. Few of these participants were aware of the current **Hunter Region 20 Year Infrastructure Plan** which suggests its relevance to them was not appreciated for similar reasons as the Hunter Regional Plan, that is, its strong focus on the Lower Hunter, as opposed to the Upper Hunter.

4. General Themes in the Upper Hunter Case Study Region

4.1 Coordinated and regional approach needed for the Upper Hunter

All participants across all participant groups agreed that the Upper Hunter should have its own Regional Plan to help guide development. A Regional Plan and a 20 Year Infrastructure Plan exist for the whole of the Hunter, yet these are seen as inadequate by participants and the Regional Plan is too broad and cannot be used as a roadmap for their area. '*There needs to be more discussion around the vision for the future*' observed a mining industry participant (Mining industry 4). An Upper Hunter Valley Strategic Plan is currently being developed by the NSW state government. The document is projected to be made publicly available before the March 2015 elections.

Coordination was seen to offer many benefits in addressing cumulative impacts including: further diversification of the economy, and improved forward planning on the basis of better sharing and dissemination of information from industry and government bodies. The opinion of a participant from the business sector that was echoed throughout all interviews was,

> '*Diversification of industries should be happening now, but no one is leading it. Government and industry should be more vocal about future projects so community (businesses) can be prepared and plan for the future. Now we are subject to booms and busts. This is seen in Resources for Regions as well, we get funding but it is all too late. State Planning should have closer liaison with Local Council to ensure infrastructure keeps up with development*'. (Other business and industry 1)

Lack of information sharing between participants was seen as a key issue that hindered coordination of a regional approach, with all LGA participants expressing that the lack of information they receive in the approval process hinders their abilities to prepare for the future. State government and industry should keep them better informed of major developments happening in the region with regards to coal mining.

> '*LGAs have no control or jurisdiction over housing, health, or education facilities. All these are overseen by state government. Yet LGAs have to coordinate these services. FIFO issues are exacerbating these problems and putting pressure on the services provided, in particular on the services for abused women*'. (Local government 1)

A previous endeavour to create a roadmap for a Queensland community (Clermont Preferred Futures) was highlighted by a company representative as a positive experience that could be transferred to the Upper Hunter. The participant listed the reasons for its success:

- ➢ Highly collaborative and consultative.
- ➢ (Local) Government or someone at arm's length from the mining company acting as coordinator,
- ➢ Mining Company/ ies having a seat at the table.
- ➢ Clarifying a framework for implementation to put ideas into practice
- ➢ Evidence based   (Mining industry 3)

4.2 Lack of coordination within and leadership by governments at all levels

Various participants raised frustrations when dealing with federal and state departments, citing the lack of coordination between departments which made the process tedious and repetitive. In the case of approval processes a mining industry participant stated:

> *'Having to get approvals at a federal and state level is not ideal. We spend too much time on project specific impact assessments and approvals and nowhere near enough time on the bigger picture, strategic, regional planning element. There is a clear lack of coordination between The Department of Planning and Environment in their role as a regulator and how they work with the Environmental Protection Agency, and vice versa. There is no holistic government position'* (Mining industry 3).

Red tape was also brought up, with mining industry participants mentioning different Departments sometimes requiring similar assessments from different perspectives. Some participants also observed a disconnect between government personnel on the ground and their head offices when dealing with development application process, which made the interactions confusing (Mining industry 4).

A business sector participant highlighted that this lack of coordination between federal and state departments has created small mining pockets owned by different companies resulting in low mining efficiency and said they would prefer to see something similar to Queensland, where companies hold larger tenures (Other business and industry 1). It was also suggested that going to two separate levels of government, state and federal, to get a development approval did not make sense (Mining industry 3), with another mining industry participant stating,

> *'Some government measures (in particular environmental land ones: Strategic Regional Land Use and Agricultural Impact Statement) are repetitive for industry, as they have already addressed similar environmental issues when conducting their EISs. Also, there is a lack of uniformity and too much bureaucracy throughout the state government'* (Mining industry 5).

Almost all participants agreed and felt a case management approach might be a good solution to the miscommunication and repetitive work they identified when dealing with federal and state government. However, a civil association participant raised the point that this approach could lead to corruption due to all the approval authority power being concentrated in one office within one government department (Civil association 1). It was unanimously agreed by all participants that state government should drive a more coordinated approach .

A number of participants felt the government should also play a greater role in managing and monitoring cumulative impacts itself. The majority of participants demanded sounder

regulations to ensure mining companies do the 'right thing'. There was a sentiment that industry would only do as much as told and hence policies needed to be streamlined and conditions and standards better crafted. In most of the interviews the Upper Hunter Air Quality Network was described as an example of a successful measure driven by the state government, however it was also mentioned that no action was taken in response to most of the information collected, which highlighted the need to proceed beyond monitoring in the adaptive management cycle. More is expected from the state department because they formulate and enforce the rules for the coal mining industry in the region.

Another issue regarded as the state's responsibility was provision of a uniform methodology for assessing cumulative social and economic impacts, not only environmental ones as has been done by such instruments as the biodiversity plans (see section 3.1.2). A local government participant raised this concern,

> '*You are telling the mining industry to address these cumulative impact issues, but there is no structure/or sense of support or documents for them to do it. The responsibility of creating a model and process falls upon the NSW state government. We need mechanisms to determine what the cumulative impacts are*' (Local government 2).

A participant from the mining industry raised similar concerns about the lack of consensus and knowledge of best practice in measuring the benefits vs. negative impacts of an extractive project (Mining industry 6). The participant also added that environmental impacts were simpler to assess due to their nature, and because they are easier to quantify. Participants clearly conveyed a lack of confidence in the state government to deliver on these high expectations. This was due to various factors, including the repeated changes made to state department names and personnel in the past 15 years (State government 2) as well as changes in policy positions, programs and legislation. An interviewee from the NSW state government however said that although many changes had occurred in the last decade, things were improving and suggested further changes to address this lack of confidence in state departments, including simplifying the approval process, creating specific policies to address minor projects, streamlining biodiversity protection policies (including maritime), defining and implementing cumulative impacts tools, and implementing more effective ways of coordinating within federal and state departments (State government 2).

4.3 Relationships between agricultural industries and mining industry

All participants interviewed made reference to the conflicted relationship between the mining and agricultural industries, in particular thoroughbred breeders, because of land use and proximity disputes. Horse studs are classified as a critical industry in the region. Most participants thought the thoroughbred breeders and the coal mining industry should learn to coexist, as they have for decades previously. More cooperation and less opposition was the common theme when presenting solutions for this dispute. One participant explained that this animosity might have originated decades ago in broken promises by coal mining companies, '*20 years ago mining companies promised to work together with other industries by improving roads. Yet when the boom came the mining companies forgot that and ignored them. This has created bad blood*' (State government 2).

Mining industry and local government participants also highlighted different performance standards for different industries with the mining industry having many more regulations to

abide by than agricultural industries, even though they utilise or impact upon the same resources of land, water and labour etc. '*The bureaucracy of it and the lack of cumulative impacts uniform guidelines is a concern, especially because mining operations have to submit different and more rigorous water approvals than farmers*' (Mining industry 5). The limited information available about some industries means assessments tend to be conservative and be based on many untested assumptions. An example of different standards that was cited was that there is a water tigger under the EPBC related to large coal mining projects (and CSG), but agricultural projects do not trigger this process regardless of water use involved. Such variances when regulating different industries have been seen by some participants as unfair, with a mining company participant explaining,

> '*Mining companies are expected to address Cumulative impacts in their EISs and for that they need and use quantitative information from other mining companies. Yet agricultural neighbours causing cumulative impacts are not expected to have and hand over numbers on their impact on highways and farming machinery noise, or farming, grazing and cropping land information. Industry is much more monitored [than farming]*' (Mining industry 4).

5. Summary: Assessing and managing cumulative impacts in the Upper Hunter

5.1 Understanding of cumulative impacts

The long history of mining in the region was evident as all participants had an understanding of the *meaning* of cumulative impacts and how these manifest in their region. Most participants interpreted cumulative impacts as environmental and socio-economic impacts stemming from multiple mining operations in the region and their aggregated effects on communities, the environment, and on a lesser scale, other industries and the economy. Because of the various coal mining operations and companies in the region, there was a consensus among participants that cumulative impacts should be managed collectively. However, there was confusion regarding how to quantify cumulative impacts, assess them, and manage them in a manner that was fair for all operations in the Upper Hunter.

Further, when referring to cumulative impacts, participants tended to focus on environmental impacts which were easier to quantify and thus assess, although they acknowledged there were cumulative social impacts as well. These were seen as more complex and more ambiguous because what one person qualifies as negative another one may qualify as positive (e.g. Labour: some people consider mining has provided the benefit of many of high paid positions yet other industries in the area see this as a drain of their own workforce because they cannot compete with the salaries). Also, social issues are viewed as less tangible, notably changes to the social fabric of communities and the accustomed lifestyle, landscape and regional identity (the sort of impacts mentioned briefly at 3.2.3). .

5.2 Scope, focus and effectiveness of cumulative impact measures

Given participants' mixed responses, it appears all but a few cumulative impact measures lack any real effect on the ground. Those few initiatives deemed highly positive included the Upper Hunter Air Quality Monitoring Network and the Upper Hunter Mining Dialogue. These initiatives are characterised by their collaborative nature, they include a range of

stakeholders in the region (government, industries, communities), share information and are transparent to the public. In particular, the Upper Hunter Mining Dialogue engages with the multidimensional scope of impacts on the region in a more aggregated manner because it not only identifies a problem (using forums), but it also encourages coordination among stakeholders to address it which materialises in collaborative working groups and networks. Because the Mining Dialogue is still underway and the working groups' reports have not been finalised the integration of the results cannot be accessed, but having this structure in place which takes into account external factors and different perspectives is a good base.

The Upper Hunter Air Quality Monitoring Network and the Upper Hunter Mining Dialogue shared similar characteristics which were deemed positive by the majority of participants. These included:

- Led by a respected organisation (NSW government in the case of the Air Quality Monitoring Network, and the NSW Minerals Council for the Mining Dialogue)
- Broad range of stakeholders involved
- Information was accessible and transparent (e.g. presented online)

The Strategic Assessment of a biodiversity plan for coal mining in the Upper Hunter was also seen as effective because of its systematic methodology for assessing cumulative impacts. Further, this initiative saw the NSW government take on the role of conducting the studies which had a very positive effect as they were planning, creating the systems and tools and delivering evidence-based action. However, what all these positive initiatives lacked was monitoring and adjusted action in response to the information collected. The information collected has to fit into a system-wide management scheme for cumulative impacts in the region to be addressed and for this to occur, monitoring of current 'successful' initiatives is key.

Legislation imposed by the NSW Government was not seen as addressing multi-sector cumulative impacts, with the majority only targeting mining operations and directed at a site based level. This was a concern among participants in regards to company compliance, mostly because companies were seen as complying with what the government mandated, thus with limited legislation around cumulative impacts, companies would not address them adequately. From the perspective of company participants, they felt a uniform and streamlined approach was needed from the government. Currently, regarding the approval process for a mining operation, there were many documents required across different departments that were seen as repetitive and time consuming, which left little time to focus on cumulative impacts.

Participants were also frustrated with the fact that some measures in place that contradicted each other. This was the case between the NSW Health Development Assessment Guideline on dust emission thresholds and the EPAs guidelines, which varied in their measurements for levels of exposure to dust that are safe for communities. Other measures in place, like the Amended SEPP standards for air quality, and noise were deemed as inefficient as they contained overriding clauses that did not hold companies accountable.

5.3 Company practice for assessing and managing cumulative impacts

Participants from mining operations closer to one another had a higher understanding of the efforts needed to cooperate with each other. Voluntary initiatives, beyond those mandated by the government, are slowly taking shape, as companies seek to address communities' complaints. Examples of this range from simple measures like companies warning other

operations of conditions predicted to exacerbate air quality impacts to more elaborate and formal minitiatives like the Hunter Valley Air Quality Monitoring Network .

As mining industry participants point out, many of the cumulative impact measures in place, are specific to single industries or single issues. This indicates a limited understanding of the full scope of cumulative impacts, such as multi-sectoral impacts, which hinders any real decision making from the government or independent action from companies to effectively tackle the problem. More information is needed about the impacts of other industries and how these are aggregated and interact with those of mining. For example dust and air pollution at present, are perceived by communities as solely caused by the mining industry.

Overall, although there are some effective measures in place for companies to assess or assist in assessing cumulative impacts (the Hunter Valley Air Quality Monitoring Network in particular), mining sites still assess their impacts based primarily on their operation because there is no multi-sectoral approach by the government for industry to integrate into their assessments. Companies assess their impacts through their EIS (this includes an SIA and an optional cost-benefit analysis) and these consider impacts at a site base level with conservative information on cumulative impacts given the difficulty of collecting information from other industries in order to present a thorough assessment. It is evident that, although cumulative impacts are relevant and discussed in the region, companies often do not evaluate, or lack the tools to evaluate, their footprint on the environment or the affected communities in terms of cumulative impacts.

5.4 Responsibilities for monitoring and managing cumulative issues

Since companies are motivated to comply with regulatory standards, aspects of the management of cumulative impacts could be guided or supported by the NSW government. In the absence of sound methodologies to assess them, and comprensive information for all industries and activities, the detailed site-level monitoring of impacts cannot readily be collated to check cumulative impacts in multi-industry regions at a system-wide level. There has not been much establishment of systems and a common methodology and only limited examples of coordinated, system-wide monitoring. Stakeholders expect this to come from the NSW government as they are in a position to collect, model and monitor the data from diverse sources. Even where this has occurred, there is not yet a clear pathway as to the adaptive responsive action that should come afterwards, in particular given that companies do not want to lead the response.

Small examples of effective measures targeting mining impacts do not address cumulative impacts of the Upper Hunter's multiple industries. This highlights the challenge of finding similar ways of assessing the various industries co-located in the region that are competing for similar resources. This would enable a multi-sectoral approach and in turn more comprehensive data to be collected for instance, and hence more effective assessment of cumulative impacts and the initiatives needed to address them. At present, even if companies attempt to conduct cumulative impact assessments or manage holistically there is not enough data from other industries to facilitate this process.

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NSW Minerals Council
http://www.nswmining.com.au/

7. Appendix 1: Questionnaire
Open ended questions – verbal answers

Introduction

Our questions will explore your experience and assessment of recent legislation, policy and practice changes intended to manage the cumulative effects of coal mining – especially in multi-industry regions. We're interested in processes for both *assessing* and *managing* cumulative impacts, whether regulatory or voluntary ones. Although we will not follow a set list of questions, some matters we might discuss are listed below.

Indicative questions

1. Brief description of your organisation and its role in assessing and/ or managing cumulative impacts?

2. Description of the key 'assets' of your community/ region? Its essential characteristics?

3. The main industries and the main positive and negative impacts of each on the community/ region?

4. What are the priority cumulative impacts for you to manage?

5. What are the main drivers for you to take action about these?

6. What are the main changes you've noticed lately with respect to cumulative impacts?

7. It seems that many requirements for cumulative impacts assessment and management relate to the project EIA and SIA and so take a project-centred approach. What are the pros and cons of a project-centred approach?

8. Please tell us about your experiences with any of the recently introduced/ reformed processes and what you regard as the pluses and minuses of them in terms of how <u>feasible</u> they are for companies and other stakeholders to rely on?

9. What about their advantages and disadvantages (ie criticisms etc) as far as <u>effectiveness</u> in dealing with the sort of cumulative impacts you need to tackle?

    a. In what ways can you implement these measures to consider the combined stresses on a system and any thresholds and system limits

10. Tell us about both unilateral and collaborative initiatives you've been involved in or observed related to managing CIs? (How successful were they?)

11. When you're undertaking assessment of cumulative impacts what are your preferred tools and approaches? What about for managing them? – what has worked best for you?

12. How would you compare the current requirements and commonly used practices with others you're familiar with?

13. What sorts of stakeholder consultation are built into these processes and what's your opinion of how adequate/ useful that is likely to be?

14. What sorts of relationships are involved (e.g. with Federal, State, and Local Government, between companies, between industries, with landholders, communities etc) in implementing processes for assessing and managing cumulative impacts?

Written Questions

1. Please detail the main local industries and the scale of them (e.g. lifespan, employment, proportion of regional GDP) [*Or tell us reports where this information is reliably reported*]

Industry	How long can it produce (lifespan)	Employment numbers	Proportion of regional production
1.			
2.			
3.			
4.			
5.			

2. Which of the following components of the socio-environmental system does your operation impact upon? (*Tick all that apply*)

    a. Catchment
    b. Aquifer
    c. Local labour force
    d. Air quality (dust and airborne emissions)
    e. Housing
    f. Social Infrastructure
    g. Biodiversity
    h. Land uses (incl. zoning)
    i. Noise
    j. Airblast pressure
    k. Ground vibration
    l. Subsidence
    m. Key resource areas/ critical industries
    n. Other (please specify)_____

3. Read through the statements below and indicate the extent to which you disagree or agree with them by ticking a box on a scale of 1 (Strongly disagree) to 5 (strongly agree).

	Statement	1 Strongly disagree	2	3	4	5 Strongly Agree
1.	Cumulative impacts on infrastructure (e.g. roads, sewage, water supply) are well managed in this LGA					
2.	The various industries in this region complement each other in terms of the resources they need					
3.	The state government has sound regulations and policies to ensure resource companies do the right thing and are held to account					
4.	There is cooperation among industries in the area to address the cumulative impacts of human activities on the environment					
5.	Local industries and operations work to address social impacts beyond their geographic boundaries					
6.	Externally reportable social impact assessments and management plans should be in place for all mining and resource extraction projects					
7.	We have good measures and monitoring of cumulative impacts in this region/ local government area					
8.	A case management approach to development applications (as adopted by DSDIP in Qld) works well.					
9.	It is best to expect proponents to mitigate only impacts that are directly related to their project and Cumulative Impact where the proportion of the impact can be readily and reasonably forecast and/or separated from the total Cumulative Impact					
10.	We need more input from local communities, landholders and scientific experts into assessment of exploration & mining proposals					

4. Each of the measures in the table that follows was introduced or modified as a way to handle cumulative impacts – especially in multi-industry contexts. Please note that the rows are colour coded with NSW-specific measures shaded grey; QLD initiatives white and Federal ones peach coloured. You may only be able to answer about your own state. For each:

- Tick in **column A** if it deals with issue/s of relevance to your operation or your locality.
- Tick in **column B** for any of the measures you have experience with.
  (*For these two columns please tick all that apply*)

In **column C** and **column D** please provide your assessment of the Effectiveness (C) and Feasibility (D) of each measure using the following rating scale:

0   I have no sense of whether this could be effective/ feasible or not
1   Not at all effective/ feasible for assessing and managing cumulative impacts
2   Effective/ Feasible to some degree, or under some circumstances
3   Effective/ Feasible to a considerable degree, or a good part of time
4   Very effective/ feasible way of assessing/ managing cumulative impacts

	A. This deals with a material issue for this region	**B.** I have experience working with this	**C.** Effectiveness for assessing or managing Cumulative impacts	**D.** Feasibility for us to implement
To assess/ manage cumulative impacts on water (underground aquifers and/ or catchments)				
Aquifer interference Policy (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Guideline on the management of stream and aquifer systems in the Hunter Valley (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Amended SEPP (mining) standards for water pollution (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Water sharing plan for Hunter unregulated and alluvial waters (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
State Water Management Outcomes Plan	☐	☐	0 1 2 3 4	0 1 2 3 4
Hunter River Salinity Trading Scheme	☐	☐	0 1 2 3 4	0 1 2 3 4
Hunter River Water Quality (Group)	☐	☐	0 1 2 3 4	0 1 2 3 4
"Water trigger" for large coal mines & CSG	☐	☐	0 1 2 3 4	0 1 2 3 4
Independent expert scientific committee	☐	☐	0 1 2 3 4	0 1 2 3 4
National Water initiative (Federal)	☐	☐	0 1 2 3 4	0 1 2 3 4
	☐	☐	0 1 2 3 4	0 1 2 3 4
To assess/ manage cumulative impacts on land use				
Strategic Regional Land Use Plans (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Just Terms Compensation (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Agricultural Impact Statement (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4

			0 1 2 3 4	0 1 2 3 4
To assess/ manage cumulative impacts on social infrastructure				
Regional Community Funds (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
	☐	☐	0 1 2 3 4	0 1 2 3 4
To assess/ manage cumulative impacts on air quality and noise				
Upper Hunter Air Particles Action Plan (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Amended SEPP (mining) standards for air quality, and noise	☐	☐	0 1 2 3 4	0 1 2 3 4
NSW Health Development Assessment Guideline on dust emission thresholds	☐	☐	0 1 2 3 4	0 1 2 3 4
Upper Hunter Air Quality Monitoring Network	☐	☐	0 1 2 3 4	0 1 2 3 4
	☐	☐	0 1 2 3 4	0 1 2 3 4
To manage cumulative impacts on multiple components				
Land and Water Commissioner (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Critical Industry Clusters (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Integrated rehabilitation plans (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Gateway Process (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Cost-benefit analysis (optional) (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Strategic Assessment of a biodiversity plan for coal mining in the Upper Hunter	☐	☐	0 1 2 3 4	0 1 2 3 4
Upper Hunter Mining Dialogue (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Hunter Regional Plan (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Hunter Region 20 year infrastructure plan	☐	☐	0 1 2 3 4	0 1 2 3 4
Resources for Regions	☐	☐	0 1 2 3 4	0 1 2 3 4
EPBC – biodiversity protection, – world & national heritage protection, – threatened species protection (Federal)	☐	☐	0 1 2 3 4	0 1 2 3 4

THANK YOU!