NSW EPA - LOAD BASED LICENSING ISSUES PAPER

NSW MINERALS COUNCIL SUBMISSION

23 December 2016

NSW MINERALS COUNCIL

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Executive Summary

The NSW Minerals Council (NSWMC) is the peak industry association representing the NSW minerals industry. NSWMC has carefully reviewed the *Review of the Load-based Licensing Scheme Issues Paper* (Issues Paper) released by the NSW Environment Protection Authority and has prepared this submission in consultation with member companies.

Mining is not covered by the existing load based licensing (LBL) scheme for valid reasons, including the complexities in applying LBL to fugitive dust emissions and the availability of more suitable regulatory mechanisms to minimise emissions from mining operations, such as the 'Dust Stop' series of Pollution Reduction Programs imposed on coal mining operations and the 'polluter-pays' Hunter River Salinity Trading Scheme.

Deloitte Access Economics has estimated that the cost of complying with existing air quality regulation alone for the NSW coal industry is **$168 million annually**. While the Issues Paper states that it will investigate 'potential inequities' of some industries being excluded from the LBL scheme, there is no evidence that suggests an unfair burden on licensees that are subject to LBL compared with those who are regulated with alternative tools, which have been shown to be effective in reducing pollution and which impose a significant regulatory burden on licence holders.

The Issues Paper contains some discussion about the mining industry's emissions to air and water and states that the review of the LBL scheme will consider whether the scheme should be extended to include other sectors such as mining.

Any proposals to increase environmental regulation must be considered very carefully, since they can contribute to regulatory costs and affect the competitiveness and commercial viability of NSW industry. Concerningly, the language and options for reforming the LBL scheme contained in the Issues Paper indicate an underlying intent to substantially increase costs incurred by NSW industry by broadening the scheme to include additional industries, moving to substantially increase pollutant fees and removing the administrative/load fee discount.

Overall, given the significance of some of the proposals contained in the Issues Paper, NSWMC is concerned with the relatively simplistic analysis in relation to the LBL scheme's effectiveness to date; the environmental impact of mining-related emissions; the practicality of including mining within the LBL scheme; and the environmental benefits that including mining within the LBL scheme would deliver.

NSWMC believes that applying the LBL scheme to mining would be ineffective, complex and inefficient, which could be reasons why there is no precedent of any similarly designed scheme being applied to mining operations. Significant issues outlined in NSWMC's submission are summarised below.

The success of the LBL scheme is unclear

- **A clear demonstration of the LBL scheme's success has not been presented** – The objectives of the LBL scheme include to *"reduce pollution … in a cost-effective and timely manner."* A well-designed system should be capable of having its performance measured against its objectives. However, the Issues Paper notes that the LBL scheme may not have been the *"catalyst for change"* and that improvements due to LBL specifically *"cannot easily be determined"*. Without this capability there cannot be any confidence that a revised system will be effective.
- **The reduction in emissions attributed to the LBL scheme correlates with a decline in industry output** – While the Issues Paper states that *"A review of trends in this data shows that LBL licensees are releasing most assessable pollutants in lower quantities than eleven years ago when considered as total loads release [sic] across NSW as a whole"*, it does not properly consider the reasons for this decline. During the time that the LBL scheme has been operating there has

been a decline in output by two key industries covered by the LBL scheme – manufacturing and coal fired power generation – and reduced production and shutdown of facilities could be the primary driver for emission reductions.

LBL is unsuitable to apply to fugitive dust emissions

- **The analysis of particulate emissions from mining projects omits important data** – The reliance on National Pollutant Inventory data to provide an indication of the impact of mining operations is concerning. There is a range of high quality monitoring data that contradicts the Issues Paper's claim in relation to PM_{10} emitted from mining operations that *"standard regulatory approaches are producing diminishing returns and cumulative impacts are expected to develop or worsen unless new complementary environment protection measures are put in place"*. Monitoring data in the Upper Hunter shows a general improvement in air quality over the last five years, despite mining not being subject to LBL and coal production increasing. While the Issues Paper states that *"The EPA will consider a range of relevant information sources (including the results of relevant studies) and data when considering whether any additional pollutants or activities should be included in the LBL scheme"*, it is unclear why this readily-available data was not considered in the Issues Paper. Furthermore, the 9-year-old coal production forecasts referenced in the Issues Paper to demonstrate projected industry growth are significantly out of date.
- **The Issues Paper understates the complexities of applying LBL to fugitive dust emissions** – Fugitive dust emissions are difficult to quantify since they are generated over a wide surface area and are influenced by a wide range of variables including meteorological factors that are outside mine operators' control. Estimation techniques generally use conservative assumptions that overestimate emissions to account for uncertainty and they lack the resolution to reflect incremental improvements in emissions performance. As a result, LBL is inappropriate to apply to fugitive dust emissions from mining, agriculture, and other extractive industries. The claim in the Issues Paper that *"improvements in emissions estimation have been made for a broad range of industry sectors, including diffuse emissions from mining activities"* since the scheme was introduced is incorrect: while new research has been conducted, published emission estimation techniques remain largely unchanged.
- **Applying LBL to fugitive dust emissions at mines is unlikely to further reduce emissions** – Mines have been required to implement best practice dust management at mine sites in line with the requirements of Pollution Reduction Programs issued by the NSW EPA and have already significantly reduced emissions. Given mines are operating at best practice, the scope for additional cost effective emissions reductions is likely to be limited, which would lead to any LBL fee essentially being an unavoidable tax on production.
- **There is significant variability in the impact of mining-related emissions** – The impact of mining related air emissions varies widely depending on the location of the mine and its environmental context. Even within the same region, two mines can have significantly different impacts depending on their proximity to population centres together with local topography and meteorology. Incorporating this variability into the LBL scheme would make it inherently more complex.

There is no evidence to support applying LBL to mine water discharges

- **There is no evidence of a regulatory gap under the existing regulatory framework** – Where mine water discharges present environmental risks there is already significant regulation in place. Of particular note is the Hunter River Salinity Trading Scheme, a highly effective 'polluter pays' regulatory tool that manages the impacts of mine water discharges. Other mines have location-specific water treatment requirements to protect downstream water quality, with one mine spending $50 million on its water management systems and infrastructure. A failure of these existing regulations to achieve water quality objectives has not been demonstrated.

- **The Issues Paper does not present scientific evidence of water quality issues** – There must be clear scientific evidence of cumulative impacts; a comprehensive understanding of the cause of those cumulative impacts; and appropriate regulatory controls across all sources contributing to the cumulative impacts to ensure the burden of pollution reduction is spread equitably across different sources. The "*emerging evidence"* that metals in mine water discharges require additional regulatory measures requires much further investigation to identify if additional measures are required. Even then, an assessment of whether LBL would be the best regulatory measure would need to be demonstrated.

Recommendations

- The EPA should not pursue the extension of the LBL scheme to include mining. The existing regulatory framework for mining is comprehensive and has been demonstrated to effectively deliver environmental improvements and meet environmental outcomes. Rather than being 'complementary' to other regulatory tools, the addition of LBL to the existing regulatory framework for mining risks complicating the regulatory framework and creating an ineffective, inefficient, complex and inequitable regulatory regime.
- The EPA should not pursue the extension of the LBL scheme to include fugitive dust emissions. The LBL scheme remains an inappropriate regulatory tool to apply to fugitive dust emissions, demonstrated by the lack any comparable precedent, and is unnecessary given the availability of more suitable regulatory tools.
- The EPA should not pursue the extension of the LBL scheme to include mine water discharges. There is no evidence to suggest that there is a gap in the existing regulatory framework for mine water discharges and the Issues Paper does not present a case for the extension of LBL to mine water discharges.
- The preparation of any proposal paper and supporting cost benefit analysis should be undertaken in close consultation with affected industries to ensure options and assumptions are realistic.

1 Introduction

1.1 About the NSW Minerals Council

The NSW Minerals Council (NSWMC) is the peak industry association representing the NSW minerals industry. NSWMC represents around 90 member companies including mining operators, mineral explorers and associated service providers. NSWMC does not represent the coal seam gas industry.

NSWMC has carefully reviewed the *Review of the Load-based Licensing Scheme Issues Paper* (Issues Paper) released by the NSW Environment Protection Authority and has prepared this submission in consultation with member companies.

1.2 The LBL scheme

The LBL scheme is implemented under the *Protection of the Environment Operations Act 1997* (POEO Act), and the *Protection of the Environment Operations (General) Regulation 2009* (POEO General Regulation). It is a fee-based policy instrument that adopts the 'polluter pays' principle. That is, fees are charged per unit of emissions, based on the anticipated severity of the associated impacts. There are LBL fees for emissions of selected pollutants to air and selected pollutants to water. The scheme covers a range of 'scheduled activities'.

Mining is not a covered by the load based licensing (LBL) scheme but is subject to a range of other regulatory tools available to the NSW EPA in relation to air and water.

1.3 The review of the LBL scheme

The Issues Paper does not provide a summary of overall recommendations and conclusions. Rather, it puts forward some 'options for change' at various points in the paper. These include options to change:

- The pollutants covered by the scheme.
- The way fee weightings are applied to specific regions of NSW[1].
- The scheduled activities covered by the scheme.
- The way "load limits" (i.e. maximum allowable emissions) are applied.
- The level of the fee.
- The way "fee rate thresholds" (i.e. emissions intensity benchmarks above which emitters are penalised) are applied.
- The way "load discounts" (i.e. reductions in fees to acknowledge emission-reduction efforts) are applied.
- The way reporting and compliance is conducted to reduce the cost of compliance for covered facilities.

Of particular relevance to the mining industry is the inclusion in the Issues Paper of some analysis of mining-related emissions to air and water and the presentation of some arguments for extending the scheme to other industries such as mining.

[1] The LBL scheme currently does this by specifying certain "critical zones" that apply to specific pollutants.

1.4 Structure of this submission

NSWMC does not believe that the Issues Paper provides sufficient justification for extending the LBL scheme to mining. This submission outlines the reasoning for this position in the following sections:

- Section 2 – assesses the potential application of LBL to mining against the criteria of effectiveness, complexity, efficiency and equity.
- Section 3 – investigates the rationale for applying LBL to fugitive dust emissions from mining projects.
- Section 4 – investigates the rationale for applying LBL to water emissions from mining projects.
- Section 5 – summarises the submission's conclusions and recommendations

2 The justification for extending the LBL scheme to include mining

2.1 Criteria for the application of LBL to mining to be justified

The Issues Paper provides a list of objectives for what the EPA considers to be a *"well-designed and effective"* LBL scheme (p. viii, NSW EPA, 2016a). These include that the LBL scheme should be environmentally beneficial, reasonable, equitable, clear, easy to use and administer, responsive, flexible, cost-effective and efficient.

These are appropriate objectives for a scheme like the LBL scheme. These objectives can essentially be broken down into the following criteria:

- **Effectiveness**: Will applying an LBL to mining result in environmental benefits (i.e. further abatement than what has already been achieved)?
- **Complexity:** Would applying an LBL to mining be simple? This includes whether it would be clear, accurate, easy to use and administer, responsive and flexible.
- **Efficiency**[2]: Is applying an LBL likely to provide a net benefit to the community?
- **Equity**: Is applying an LBL to mining fair and reasonable?

The assessment of appropriateness of applying LBL to mining, based on each of these criteria, is discussed in the following subsections with further detail on fugitive dust and water in section 3 and section 4 respectively.

2.2 The effectiveness of applying LBL to mining

2.2.1 The effectiveness of the LBL scheme to date is unclear

The Issues Paper highlights that emissions from covered sectors have declined following the introduction of the LBL scheme. For example, Figure 3-1 of the Issues Paper shows that except for fluoride, emissions of all air pollutants from sectors covered by the LBL scheme have been declining to a greater or lesser degree (p.12, NSW EPA, 2016a). This is implicitly provided by the EPA as a point of evidence that suggests the scheme is effective. However, as discussed below, there are number of reasons why these trends are not that meaningful for assessing the scheme's effectiveness.

2.2.1.1 The decline in emissions under the LBL correlates with a decline in industry output

Emissions from sectors covered by the LBL scheme have been trending down, but so too has activity. This has undeniably been the case in two key sectors covered by the LBL scheme: manufacturing and electricity generation. For example, there has been a sharp decline in manufacturing activity following the Global Financial Crisis (GFC) in 2008.

[2] For the purposes of this assessment, "efficiency" refers to economic efficiency.

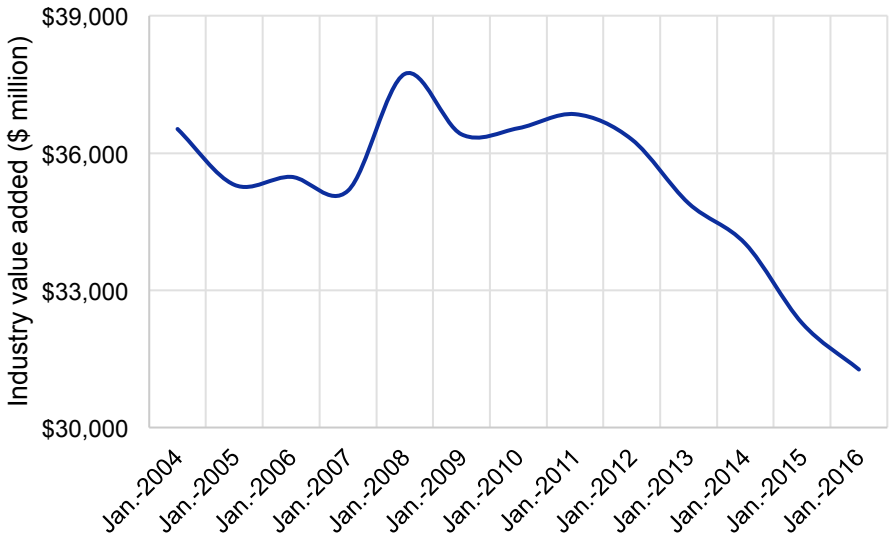

Figure 1: NSW manufacturing industry value added (chain volume measures) (ABS Cat 5220.0)

In-fact, the trend in economic activity from the manufacturing sector closely matches the trend in "overall" emissions depicted in Figure 3-1 of the Issues Paper.

Similarly, electricity generation from coal has declined sharply due to do a combination of lower electricity demand and an increase in other sources of electricity generation. For example, based on analysis of data provided by the Australian Energy Regulator (AER), generation of electricity from black coal in NSW is estimated to have decreased by approximately 20 per cent over the period from 2003-04 to 2013-14 (based on analysis of data in AER, 2016).

In contrast, the value added from mining has increased rapidly over the same period (see Figure 2), which correlates with the increases in emissions estimates in the National Pollutant Inventory. Neither the decline in estimated emissions from facilities subject to LBL nor the increase in estimated emissions from the mining sector are indicators of environmental performance or emissions intensity.

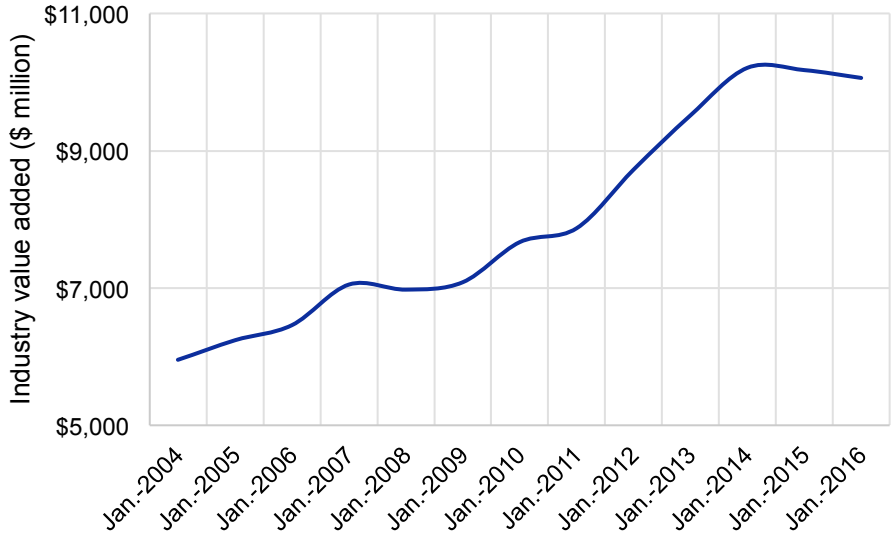

Figure 2: NSW mining industry value added (chain volume measures) (ABS Cat 5220.0)

2.2.1.2 The link between fee levels and emissions reductions is weak

LBL fees on the electricity sector dominate overall fee revenue (see Figure 3).

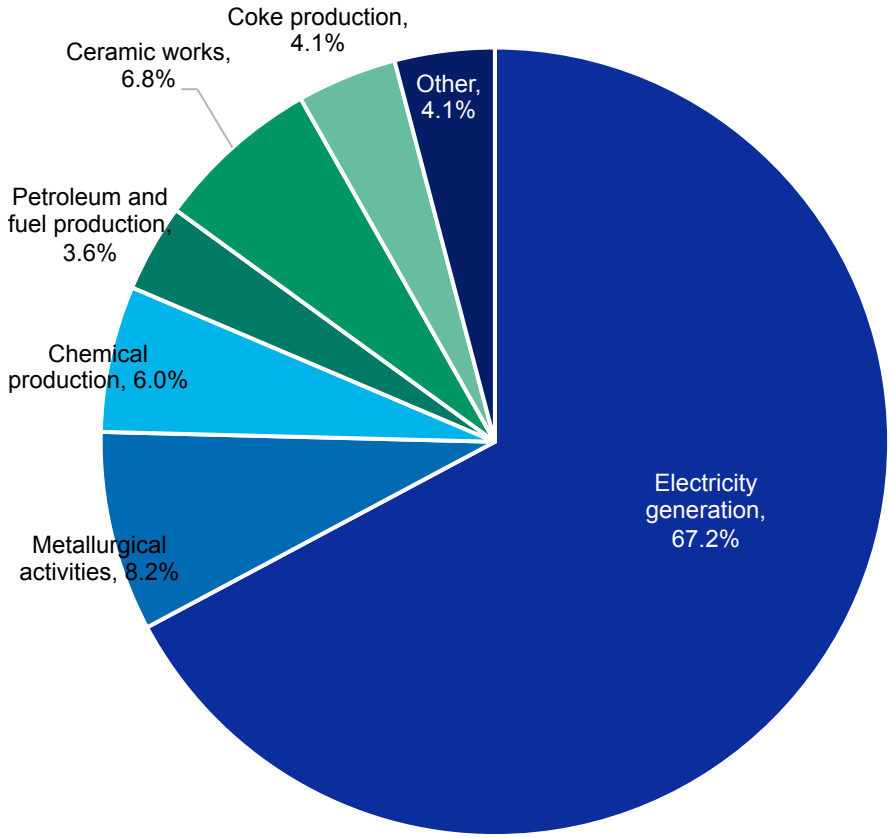

Figure 3: LBL fees in 2013-14 by scheduled activity (Figure 3-6, NSW EPA, 2016a)

The Issues Paper does not provide an exact breakdown of fees for the electricity sector by pollutant. However, NO_X would be the largest component of the load-based fee. Fee revenue from NO_X emissions dominates overall fee revenue (see Figure 3-5, NSW EPA, 2016a), and the electricity sector is a large emitter of NO_X.

Interestingly, NO_X emissions from sectors covered by the LBL scheme seem to have declined only slightly (Figure 3-1, NSW EPA, 2016a). In particular, two large licensed electricity generators, the Bayswater and Liddell power stations, have reported no reduction in NO_X in their annual returns, despite fees on NO_X accounting for most of their LBL. However, emissions of PM_{10} (i.e. "fine particulates" as they are referred to in the LBL scheme) have declined over the same period, despite accounting for a much smaller proportion of fees.

NSWMC notes that the emissions estimates for these two power stations were made under the previous NSW Government ownership.

The substantial reduction in PM_{10} emissions from Liddell (around 550 tonnes) alone appears to have contributed to more than 10 per cent of the overall reduction in PM_{10} depicted in Figure 3-1 of the Issues Paper. The reason for this substantial reduction is unclear.

Based on the available data, it appears that there is not a strong link between fee levels and emissions reductions.

2.2.1.3 Acknowledgement that there is a lack of evidence of a causal link

The Issues Paper appears to acknowledge that while a range of jurisdictions apply emissions fees, it is unclear whether these have been effective at driving *incremental* emissions reductions, beyond those that would have already resulted from the range of other regulatory measures that are also in place (e.g. BDA Group, 2014):

> *"Yet the level of incentives varied significantly and whether many countries' emissions reductions have been due to emissions fees independent of command-and-control measures is debatable, if not intractable."*

In fact, the Issues Paper acknowledges that the LBL scheme may *not* have been the "catalyst" for change in cases where licensees have made improvements for non-LBL reasons (p.15, NSW EPA, 2016a):

> *"The extent to which this improved performance is due to licence requirements, other regulatory approaches or LBL specifically cannot easily be determined. For example, some environmental improvements are made by licensees for non-LBL related reasons (e.g. to meet regulatory standards, to replace worn out equipment) but have a spin-off effect of lowering licence fees as pollution is reduced. In such a case, the LBL scheme may not have been the catalyst for change, but it may have provided an additional economic incentive for the licensee to proceed. It would be difficult to 'rate' what contribution the LBL scheme made in such cases, as it was only one of a number of contributing factors."*

Ancev et al (2012) note that LBL fees did not have a statistically significant effect on NO_X abatement.

2.2.2 Extensive existing regulation of mining limits further abatement opportunities from LBL

Applying LBL to mining would only be effective at reducing pollution if there were readily available abatement opportunities. The mining industry has already implemented a range of abatement measures under existing regulation and various emissions reduction programs. The EPA is also exploring additional regulatory tools that would result in further abatement from the industry. These policies are summarised in Table 1.

Measure	Type of policy
Environment Protection Licence conditions	Site-specific pollution criteria and monitoring requirements
Reducing dust emissions from unsealed haul roads at NSW coal mines	Pollution Reduction Program requirement to control at least 80% of dust from haul roads
Modifying or ceasing operations during adverse weather at NSW coal mines	Pollution Reduction Program requirement to develop procedures to alter operations during adverse weather to minimise dust generation

Voluntary acquisition and mitigation policy	Granting of acquisition rights to properties affected by noise and dust impacts from mines in NSW, requiring mines to negotiate acquisition with property owners
Upper Hunter Air Quality Monitoring Network	Coal and power generation industry funding for air quality monitoring network in the Upper Hunter region
Non-road diesel emissions standards	Proposed new standards for exhaust emissions from non-road diesel equipment at NSW coal mines
Hunter River Salinity Trading Scheme	Requirements to purchase and hold salinity credits in order to discharge saline water into the Hunter River
Treatment of water discharge	Several mines have negotiated with the EPA around the treatment of discharge water in order to meet water quality objectives
Mining Operations Plan	Progressive rehabilitation of disturbed land

Table 1: Examples of environmental regulation of mining operations

For example, under the "Dust Stop" program, the EPA issued a series of legally binding Pollution Reduction Programs (PRPs) to all open cut coal mines in NSW, which required the mines to identify and implement measures to reduce dust emissions. Given that the specific initiatives under the "Dust Stop" program already require mines to consider all "best practice" measures[3], the scope for further emissions reductions is likely to be limited.

Furthermore, mines often go beyond regulatory requirements to minimise their impacts. In the area of air quality, for example, several mines have used aircraft to distribute seed on overburden areas in order to establish some vegetative cover to help stabilise the surface and minimise potential dust lift off.

2.3 The complexity of applying LBL to mining

2.3.1 The LBL fee structure does not reflect the wide variability of the external costs of mining-related emissions

Load based fees adopt a "polluter pays" principle. That is, the level of fees is intended to be linked to the severity of impacts associated with a polluter's emissions. It therefore requires an understanding of the relative severity of the impact across different sources. These impacts can vary significantly according to the characteristics of the receiving environment. For example, the health costs of particle emissions can vary by orders of magnitude depending on the source (PAE Holmes, 2013).

The LBL scheme accounts for this variability by having different fee levels for pollutants that are emitted from specific "critical zones", and also a higher relative fee level for NO_X and VOCs emissions in summer.

This sort of regional differentiation of fees will not be able to account for the variability in the external costs of mining emissions. The external cost of mining emissions is influenced heavily by proximity of the mine to population centres and by local meteorology. Two mines could be in the same broad

[3] http://www.epa.nsw.gov.au/air/coalminingNSW.htm

geographical area but have very different external costs associated with their emissions if one mine is located close to a major population centre and in the direction of the prevailing winds, and one mine is located further away from the major population centre and in a direction that is not the same as the prevailing winds.

The LBL scheme would need to adopt a much more complex formula to accurately reflect the variability in external costs from mining sector emissions. This is unlikely to be practical. Given the impracticality of reflecting this variability in the fee structure, risks relating to the scheme's efficiency are amplified.

2.3.2 Fugitive dust emissions and diffuse water pollution are difficult to accurately quantify

The challenges in accurately estimating fugitive dust emissions to air are a fundamental impediment to including mining in the LBL scheme. These challenges apply to other fugitive dust emission sources such as agriculture, as well as to diffuse water pollution sources such as agricultural runoff. NSWMC notes that the Issues Paper does not canvass extending the scheme to agriculture, which is understandable given the complexities involved, however the Issues Paper does canvass incorporating fugitive dust emissions from mining without sufficiently exploring the complexities.

The challenges in accurately estimating fugitive dust emissions (and emission reductions) are discussed in Section 3. If emissions cannot be accurately estimated, let alone the impacts of those emissions, a scheme that heavily relies on charging fees in proportion to emissions and impacts is impractical.

2.3.3 Challenges in establishing a fee rate threshold for air emissions

The LBL fee structure includes a fee rate threshold (FRT), which is a benchmark emissions intensity above which higher fees are charged. An appropriate benchmark would be very difficult to calculate in a mining context.

In addition to the complexities of including meteorological variables in emission estimation calculations, there are other factors to consider which are specific for individual mines. For example, the strip ratios, the depth of the pit and the mine plan itself.

The ratio of overburden to coal, or strip ratio, will have an impact on the emissions intensity of mining. In other words, one mine may need to remove twice as much overburden to access the same amount of coal. This could result in significantly more emissions, and where an FRT applies, this would then correlate with a significantly higher fee. Using an indicator such as the amount of overburden removed, or even the amount of coal extracted, on which to base an FRT does not therefore represent a level playing field across the industry sector.

Other factors such as the length of haul roads will also influence emissions intensity. Depending on the geographic spread of the coal resource, one mine may have significantly longer haul roads and therefore emissions will be greater than a neighbouring mine where haul roads are shorter. One may argue that this will incentivise individual operators to better design their mine plans to keep haul roads as short as possible, but this is not always possible due to the location and depth of the resource. In practice, operators already spend considerable time and money designing the most efficient haul road networks to reduce diesel use and operating costs. It is already in the best interests of the mine to keep these roads as short as possible and further incentives are unwarranted.

In summary, given the number of variables involved in estimating emissions from mining (both volumes of material and meteorological parameters) there is unlikely to be a method of establishing an FRT that is either effective or equitable.

2.4 The efficiency of applying LBL to mining

2.4.1 Abatement costs are not a relevant consideration for the setting of fee levels

There is a risk that attempting to apply an LBL to mining will result in some cases where fee levels are higher than external costs. This risk is amplified because of the EPA's suggestion that it would be appropriate to set fee levels in line with abatement costs – e.g., *"…the EPA will need to determine the level that the PFU needs to be set to so it results in fees which exceed the cost of abatement for all pollutants"* (p.54, NSW EPA, 2016a).

An emissions fee is only economically efficient if it incentivises abatement where the abatement delivers a net benefit to society. The benefit of abatement is based on the avoided external cost. If fees are set at the level of abatement costs and abatement costs are higher than the benefit of abatement (i.e. the external costs avoided), then the application of the fee would result in a net cost to society.

The logic in Box 4-3 of the Issues Paper is not entirely correct. The theoretical optimal level of load-based fees has nothing to do with abatement costs. In theory, optimal load-based fees should be set at the level of external costs. There may be some cases where this also happens to be the level of abatement costs, but not always. In particular, the abatement costs for some mines may be well above the external costs, due to the range of measures mines have been required to implement. In this case, abatement costs should be irrelevant for the setting of fee levels.

2.4.2 Applying an inefficient tax to industry to fund other emissions reductions is not supported

The Issues Paper proposes, as one of the options for changing the LBL scheme, to use a proportion of LBL revenue for emissions reduction activities on non-LBL covered activities, such as domestic wood-heaters (p. 77, NSW EPA, 2016a). This could lead to the situation where an inefficient tax is applied to one sector (e.g. mining), with limited incremental emissions reductions from that sector, but used to fund emissions reductions from other sources.

If there are practical and cost effective options to reduce emissions from any sources, which are not currently incentivised by the range of policies in place, it would be much more efficient for the Government to invest directly in these opportunities than to reinvest proceeds of an inefficient tax.

2.4.3 The potential for unintended or distortionary outcomes

In some cases, applying additional regulation can detract from the efficiency of existing regulation, or result in other unintended consequences. For example, in relation to water discharges in the Hunter, salinity issues are currently managed through the HRSTS, which is a market-based mechanism. Introducing an LBL to manage water discharges already subject to the HRSTS would influence:

- The quantities of HRSTS credits required by the mining industry.
- The price that the industry is likely to bid for these credits.

The advantage of a trading scheme like the HRSTS is that if it is well designed, the market tends to achieve desired environmental objectives at the lowest cost. "Coupling" this market with another mechanism like the LBL can have unforeseen consequences. For example, emitters could adopt measures to reduce LBL fees, which also simultaneously increase demand for HRSTS credits. This could raise the price of HRSTS credits for other sectors, referred to as a "pecuniary" externality. A PRP on the other hand, could take these "spill-over" effects into account, and ensure that any abatement measures do not result in such unintended outcomes.

2.5 The equity of applying LBL to mining

2.5.1 There is no 'inequity' as a result of mining not being included in the LBL scheme

The Issues Paper raises the question of whether it is 'equitable' that only some licensed industries are subject to LBL. For there to be any inequity, it would require an industry that is not included in the LBL scheme to be subject to a lower level of regulation and a disproportionately lower share of the burden of reducing emissions.

There is no evidence of any inequity in the fact that mining is not included in the LBL scheme. The NSW EPA, the NSW Department of Planning and Environment and the NSW Department of Industry each have a role in the environmental regulation of mining operations and there is a range of other regulation that requires mines to monitor, minimise and reduce pollution. Deloitte Access Economics has estimated that the cost of complying with existing air quality regulation in the NSW coal industry alone is **$168 million annually** (Deloitte Access Economics, 2015).

This existing regulation has been demonstrated to reduce emissions at mine sites. For example, the EPA stated that the Pollution Reduction Program that requires coal mines to achieve at least 80% control of dust on haul roads led to a 20,000 tonne per annum reduction in particulate emissions.[4]

The Issues Paper notes that there are regions where air quality standards will be challenging to meet and notes that mining emissions contribute to cumulative impacts in those regions. However, it would be inequitable if the burden for addressing cumulative impacts falls disproportionately on one source. While there are measures targeting other sources, mining risks being placed with a disproportionately large share of the financial burden. It is important to note that:

- The mining sector is subject to a range of other regulatory measures, while other sources are not.
- Other sectors similar to mining from a policy standpoint (i.e. those with similar challenges with regards to e.g. effectiveness, complexity, efficiency etc.) are not included in the LBL scheme, nor does it appear the EPA is considering their inclusion.
- There are other sources that contribute to cumulative impacts.

2.5.2 Other sectors with similar challenges to mining are not included in the LBL scheme

There are other sectors that are not currently covered by the LBL scheme, and where the LBL scheme may not be an appropriate tool. For example, applying the LBL scheme to agriculture would have similar drawbacks in relation to effectiveness (i.e. the sector is subject to a range of existing environmental regulations, albeit to a lesser degree than the mining sector), efficiency (i.e. there is likely to be a large variation in external costs), and complexity (i.e. emissions are not easy to estimate accurately).

Not unlike mining, the agricultural sector contributes to cumulative impacts in regions with already high pollutant concentrations. For example, based on OEH monitoring data, $PM_{2.5}$ concentrations at the Wagga Wagga North monitoring location (which has no mining in the surrounding areas) are around the same level as Singleton, and in some years even higher. Also not unlike mining, agriculture is projected to grow and benefit from high commodity prices.

The agriculture sector is also a large emitter of nitrogen and phosphorus. The critical zones defined in the LBL scheme for water relate only to these two pollutants. A study commissioned by the EPA noted that on the limited information available, there are likely to be economically efficient abatement opportunities relating to these two pollutants (ACIL Allen Consulting, 2014).

[4] http://www.epa.nsw.gov.au/air/coalminingnsw.htm

Notwithstanding some differences between the mining and agricultural sectors, both have emissions that are currently regulated through other mechanisms, and both have challenges associated with inclusion in the LBL scheme. Including one sector and not the other would appear to be an inconsistent regulatory approach.

2.6 The absence of a precedent

As evidence of the likely ineffectiveness, complexity, inefficiency and inequity of including mining in an LBL, NSWMC has not been able to identify a precedent for this in other jurisdictions.

BDA Group (2014) provides a summary of air pollution charging schemes around the world. Table 3.3 of the BDA Group report lists jurisdictions that have air emissions charges, and the liable activities included in the respective schemes. The only jurisdiction in that list that has substantial coal mining activity is Poland. The scheme in Poland only covers industrial boilers. While some US states have air pollution charging schemes, which cover major stationary sources, no major mining state is listed.

Western Australia and South Australia both operate load based fee systems, and while these adopt a polluter-pays principle, fee levels are modest and designed for cost recovery (BDA Group, 2014). The load based fee for coal mines under the fee levels set by the WA scheme would be a fraction of what would be incurred under the current NSW scheme.

2.7 The distribution of fee revenue is not an indicator of the need for change

The Issues Paper provides data on the distribution of fee revenue and at several points discusses whether this distribution reflects "EPA priorities". For example, the discussion suggests that fee revenue does not reflect the EPA's priority to reduce particle emissions.

Comparing fee revenue to priorities is inappropriate. There are several reasons why the distribution of fee revenue does not reflect priorities. This could be because:

- LBL fee revenue is not a good indicator of total expenditures associated with addressing emissions. Indeed, the mining industry incurred significant expenditures in emissions reduction, and this is not reflected in LBL fee revenue.
- Fee levels are driven by both fee rates, which are weighted more or less according to the perceived relative severity of pollutants, and the quantity of emissions. If a pollutant is emitted in large quantities across NSW, for example NO_X, this will be reflected in its contribution to fee revenue. This is particularly going to be true if there are limited economic abatement opportunities for this pollutant. By contrast, a pollutant that is known for harmful effects, such as mercury, may not have a large representation in fee revenue. This does not necessarily indicate some deficiency in the fee structure of pollutants in the LBL.

2.8 Fewer, better targeted policy and regulatory tools are more effective

Many different policy and regulatory tools designed to reduce emissions have been applied to the mining industry, potentially because the industry is not included in the LBL scheme. It is generally accepted that adding yet more policy tools risks unexpected and unintended outcomes, (e.g. p.309, Knudson, 2009):

> *"Generally speaking, the fact that policy instruments often affect more than one policy target implies that the fewer the instruments the better. Governments should try to limit the number of policy instruments to the number of targets. An excessive number of tools will lead to more interaction between targets and instruments, making it more difficult to achieve all the targets. Trade-offs that are often difficult enough when dealing with a well-designed set of targets and policy instruments become more pronounced the greater the number of tools because of the fact that tools often affect more than one target."*

3 The rationale for applying LBL to fugitive dust emissions from mining projects

The Issues Paper directs considerable attention to fugitive dust emissions from mining operations. While the Issues Paper does not present an explicit case for including fugitive dust emissions from mining in the LBL scheme, it does provide several arguments for doing so including:

- Historical and projected future growth in estimated particulate emissions from the mining sector, as reported in the National Pollutant Inventory.
- The claim that *"standard regulatory approaches are producing diminishing returns and cumulative impacts are expected to develop or worsen unless new complementary environment protection measures are put in place"*.
- The claim that the original reason for excluding fugitive dust from the LBL scheme (i.e. difficulties in accurately estimating emissions), may no longer be relevant since *"improvements in emissions estimation have been made for a broad range of industry sectors, including diffuse emissions from mining activities"*

This section analyses these issues and concludes that the Issues Paper's analysis is incomplete and does not provide sufficient justification for fugitive dust emissions to be incorporated into the LBL scheme.

3.1 The available data does not suggest existing regulatory approaches are failing to manage emissions

3.1.1 The NPI emissions estimations are a poor indicator of the impacts of mining operations on air quality

The reliance of the Issues Paper on emission estimations in the National Pollutant Inventory (NPI) as an indicator of the impact of mining-related emissions is inappropriate for several reasons:

- Emissions estimations for fugitive dust are subject to inherent uncertainty – Emissions estimations for fugitive dust emissions at mining projects use very conservative assumptions and methods that result in an overestimation of emissions. The NPI provides a very coarse indication of emissions from mining projects.
- Emissions alone are a very poor indicator of impacts – The Issues Paper directs little attention to the distinction between emissions and impacts. A given quantity of particulate emissions in the mining sector will generally have a lower impact that the same quantity of emissions as industrial facilities in urban areas due to the greater distances between mining operations and population centres. Some dust emissions from mining projects will not even leave the site boundary, or will fall on properties owed by the mining operation.

In any case, the Issues Paper only reports the NPI data up to the 2013-14 reporting year. The 2014-15 results were released in early 2016, showing two consecutive years of reductions in estimated emissions.

3.1.2 Monitoring data shows air quality improving in the Upper Hunter while production increases

Monitoring data contradicts the Issues Paper's claim in relation to PM_{10} emitted from mining operations that *"standard regulatory approaches are producing diminishing returns and cumulative impacts are expected to develop or worsen unless new complementary environment protection measures are put in place"*.

The evidence that growth in emissions is not necessarily leading to higher concentrations of particulate matter can be seen when examining the PM_{10} and $PM_{2.5}$ monitoring data from the Upper Hunter Air Quality Monitoring Network (UHAQMN). Data are available from 14 monitoring sites between 2012 and 2016[5] and the PM_{10} and $PM_{2.5}$ average across the entire network for each year is shown below.

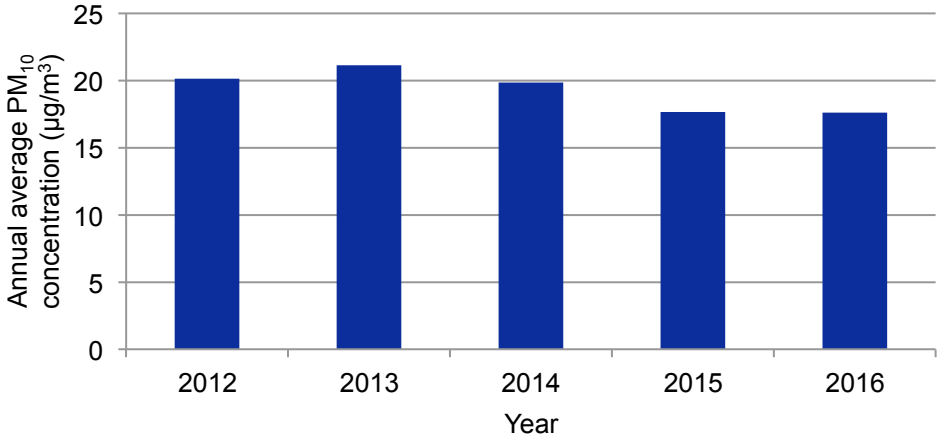

Figure 4 Annual PM_{10} concentration across the Upper Hunter network (2012 – 2016)

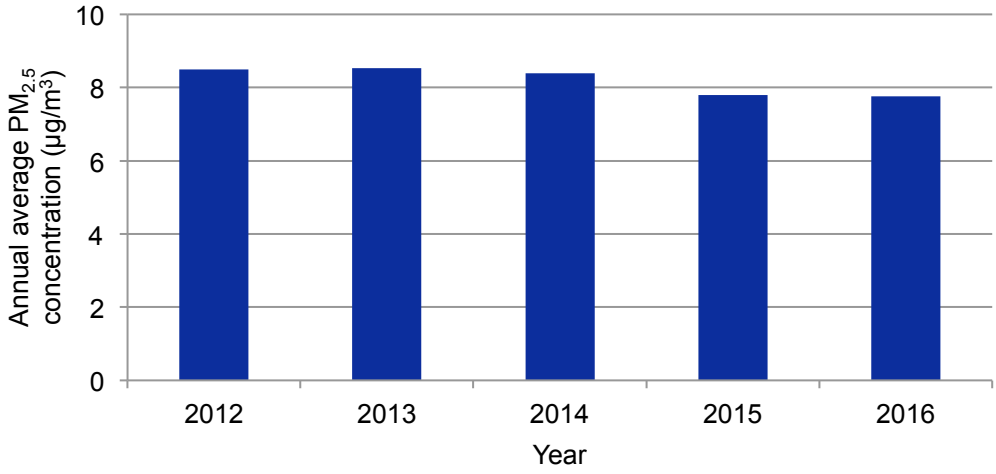

Figure 5 Annual $PM_{2.5}$ concentration across the Upper Hunter network (2012 – 2016)

The air quality monitoring data shows that air quality has generally improved over the last five years. The improvements in air quality have occurred at the same time that coal production volumes in the Hunter Valley have increased.

[5] 2016 data were available up to and including November 2016

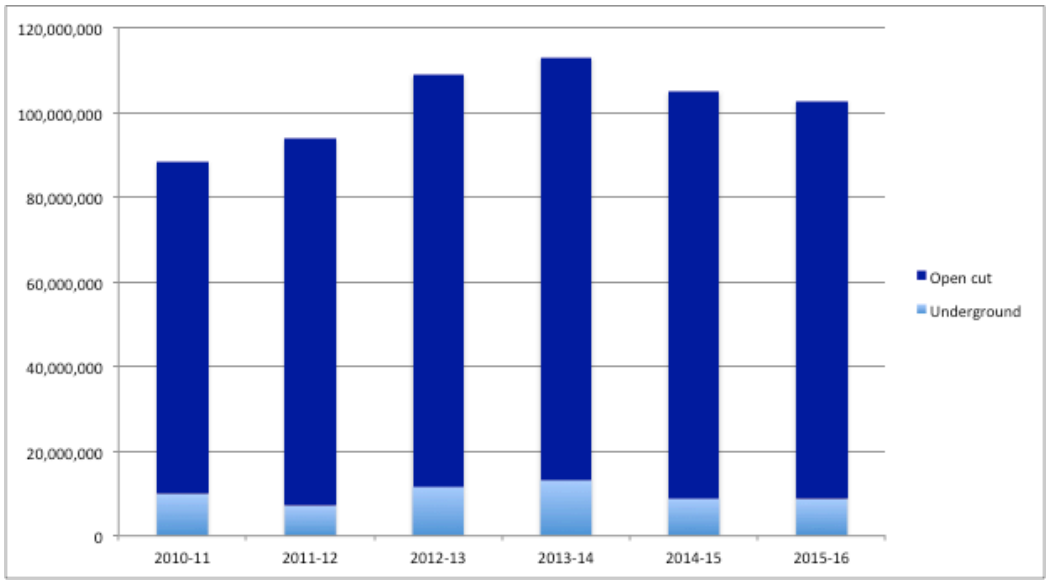

Figure 6 Hunter Valley saleable coal production 2010-11 to 2015-16 (Coal Services)

With the exception of 2013, when there was significant bushfire activity across NSW, which increased the annual average, concentrations for both PM_{10} and $PM_{2.5}$ have been decreasing even though production has been increasing and emission calculations may suggest that emissions from mining have been increasing. This is an indication that, in the case of mining, increasing estimated emissions do not necessarily equate to increased impacts. If one of the desired outcomes of the LBL scheme is to reduce the impacts on human health by decreasing emissions, then relying on the NPI calculations to support a case for inclusion is problematic.

While the Issues Paper states that *"The EPA will consider a range of relevant information sources (including the results of relevant studies) and data when considering whether any additional pollutants or activities should be included in the LBL scheme"*, it is unclear why this data was not included in the Issues Paper.

3.1.3 The coal growth forecasts referenced in the Issues Paper are significantly out of date

The Issues Paper states that *"Coal production in the Hunter Valley is increasing and this is expected to continue (e.g. ACIL Tasman 2009 projected a 26% increase in coal movements production [sic] in the Hunter Valley-Newcastle between 2014 and 2024"* (p16, NSW EPA 2016a).

The 2009 report that the Issues Paper references draws on 2008 Australian Rail Track Corporation (ARTC) coal transport forecasts (ARTC 2008). Much has changed in the coal industry in the almost 9 years that have passed since these forecasts were made.

The 2008 ARTC forecasts predicted exports of 220 million tonnes of coal through Newcastle in 2014. Actual exports through Newcastle in 2014 were 159 million tonnes – 61 million tonnes lower than predicted.

These 9-year-old coal production forecasts are out of date and are a misleading indication of the industry's growth.

3.2 Applying LBL to fugitive dust emissions from mine sites is inherently complex

Particulate emissions from mining are almost exclusively classed as fugitive emissions and as such are highly variable. Fugitive dust emissions are difficult to quantify since they are generated over a wide surface area and are influenced by meteorological factors that are outside mine operators' control. Estimation techniques generally overestimate emissions to account for uncertainty and they lack the resolution to reflect incremental improvements in emissions performance. As a result, LBL is inappropriate to apply to fugitive dust emissions from mining, agriculture, and other extractive industries.

For example, in the case of wind erosion from exposed areas, which can occur over large areas, emissions can be highly dependent on the type of material, how long it has been exposed, the stage of rehabilitation, recent rainfall patterns, wind speeds, temperature and humidity. The direct measurement of emissions is cost prohibitive and impractical. The complex interaction of all these variables cannot be accounted for in the equations used for calculating wind erosion and estimates for these sources are often overestimated.

Section 4.2.3 (page 41) of the Issues Paper states that:

> *"Sectors that release significant quantities of pollutants sourced from diffuse or fugitive sources (e.g. the mining sector) were originally excluded from the LBL scheme because the techniques used to estimate emissions from diffuse sources were not readily available. However, improvements in emissions estimation have been made for a broad range of industry sectors, including diffuse emissions from mining activities."*

It is not clear from the context of this statement whether this is referring to emissions to water or to air. However, it is difficult to see how this could be referring to PM emissions to air, as there are relatively few sources for emission factors and these have not materially changed since 1985. Emission factors are predominantly sourced from the USEPA's AP-42 emission factor work and supplemented by work done in 1983 by the State Pollution Control Commission (SPCC, now EPA) and in 1998 by the National Energy Research Development and Demonstration Council (NERDDC, 1998).

While the industry has invested in research to improve the accuracy of emission estimation techniques and new emission factors have been developed, these emission factors have not yet been adopted by governments. That being said, the current emission factors are fit-for-purpose. That is, they allow operators to develop conservative estimates of emissions for use in air quality modelling for environmental impact statements. They are not designed for quantifying emissions for the application of load-based fees

3.3 There are significant contributions to particulate matter exposure from other sources

The Issues Paper argues that the contribution of mining to cumulative impacts is projected to make attainment of the annual average $PM_{2.5}$ National Ambient Air Quality Standard of 8 $\mu g/m^3$ in Singleton and Muswellbrook unlikely to be achieved. The Issues Paper could be seen as making an implicit argument for placing a disproportionate share of regulatory burden on the mining sector. This is neither efficient nor equitable.

There are other more significant sources of $PM_{2.5}$ that may be easier to measure and simpler to control. The obvious example is wood smoke from home heating which is the largest single (primary anthropogenic) contributor to annual average $PM_{2.5}$ concentrations for Muswellbrook (16.9%), as found in the Upper Hunter Air Quality Particle Model study (Pacific Environment, 2014).

Health evidence shows that all sources of particulate matter should be treated equally, and that reducing exposure by 1 $\mu g/m^3$ from any source would have the same benefit as any other source, all else equal. Regulatory attention should be in proportion to the significance of each source.

3.4 There is significant variability in the impact of mining-related emissions

As discussed in Section 2, the impact of mining related air emissions varies widely depending on the location of the mine and its environmental context. Even within the same region, two mines can have significantly different impacts depending on their proximity to population centres together with local topography and meteorology. Incorporating this variability into the LBL scheme would make it inherently more complex.

3.5 Applying LBL to fugitive dust emissions at mines is unlikely to further reduce emissions

As discussed in Section 2, mines have been required to implement best practice dust management at mine sites in line with the requirements of Pollution Reduction Programs issued by the NSW EPA and have already significantly reduced emissions. Given mines are operating at best practice, the scope for additional cost effective emissions reductions is likely to be limited, which would lead to any LBL fee essentially being an unavoidable tax on production.

4 The rationale for applying LBL to water pollutants from mining operations

The Issues Paper provides some information on water pollutants from mining operations, largely based on National Pollutant Inventory data, and presents some arguments for extending the LBL scheme to cover mining operations including:

- Mine water discharges can have high levels of salinity and metals
- There is emerging evidence that additional measures are required to address the potential impacts of mine water discharges
- Mines are a significant source of metal emissions to water that are not captured by the LBL scheme.

NSWMC does not believe that the analysis presented in the Issues Paper is sufficient to justify any proposals to extend the LBL scheme to capture water pollutants from mining projects.

4.1 There is no evidence of a regulatory gap under the existing regulatory framework

Where mine water discharges present environmental risks there is already significant regulation in place. Of particular note is the Hunter River Salinity Trading Scheme, a highly effective 'polluter pays' regulatory tool that manages the impacts of saline mine water discharges on the Hunter River.

Mines that are not captured within the Hunter River Salinity Trading Scheme have location-specific water discharge criteria that are developed on a case-by-case basis to protect the water quality of the receiving waters. In some cases, mines are required to install water treatment infrastructure in order to meet these discharge criteria. Other sites are 'zero discharge' sites and are not permitted to discharge water.

The Issues Paper does not demonstrate a failure of these existing regulatory measures to achieve water quality objectives or how LBL may contribute to more flexible water management systems that can deal with climatic extremes.

The following case study demonstrates the extensive level of investment in water quality management under the existing regulatory framework for mining operations.

Case Study – Investment in water quality management under existing regulatory framework at Ulan Coal Mine

Ulan Coal Mine, located in the Western Coalfield north of Mudgee, is licensed to discharge water into the Goulburn River in accordance with licence conditions that set limits on the volume of discharge and the pollutants contained in discharge water. The licence conditions also require water quality monitoring to assess performance against those limits.

To meet its licence conditions, Ulan Coal Mine has invested around $50 million in water infrastructure and employs a dedicated water management team to operate and maintain the water management facilities. The range of initiatives is summarised in the table below.

Ulan Coal Mine has taken these steps in consultation with the NSW EPA. They demonstrate the significant resources directed to managing water quality impacts under the existing regulatory framework and raises the question of what additional benefit the application of a load based licensing fee would deliver.

Improvement implemented	Project benefit outline
Addition of a permanent Water Management Team to operate and maintain the water management facilities. This team currently includes a: • Water Superintendent • 3 Water Operators	Dedicated team focused on water management for the Complex. • Leadership involvement • Dedicated inspection and maintenance regime • 24/7 monitoring coverage • Detailed Water Infrastructure Management Plan • Assurance Programme
North West Sediment Dam Water Treatment Facility (4 trains)	Focused dewatering of water stored in the East Pit.
Ulan West Clean Water Diversion Drain	Reduced catchment footprint, therefore reducing requirement for water management onsite. Keeps clean catchment water in the catchment.
UCML Clean Water System	Internal clean water diversion system again reduces the site's catchment footprint and diverts clean catchment water to the catchment without a management requirement.
Ulan Surface Operations Clean Water Diversion Drain	Reduced catchment footprint, therefore reducing requirement for water management onsite. Keeps clean catchment water in the catchment.

North West Sediment Dam Water Treatment Facility – upgrade and increase in capacity	The new water treatment plant and pre-treatment to supply the new and existing water treatment facilities was designed and specified, based on the findings of blend modelling. It increases permeate production by a minimum additional 8.0 ML/day, and provides water suitable for discharge, in accordance with the criteria specified in EPL 394 and with minimal elemental constituents. The treatment and discharge provides sustainable 'life of mine' water management, reducing water storage area over time and providing a safe operating area.

4.2 If further regulation was required, LBL may not be the most appropriate regulatory tool

It should not be assumed that if there are impacts that require regulatory intervention, LBL is the most appropriate regulatory tool to apply. Consistent with best practice guidelines for regulatory assessment, there would need to be an assessment of a range of options to determine the most appropriate tool to address the impacts under consideration. There must be clear scientific evidence of cumulative impacts; a comprehensive understanding of the cause of those cumulative impacts; and appropriate regulatory controls across all sources contributing to the cumulative impacts to ensure the burden of pollution reduction is spread equitably across different sources.

In many cases LBL may not be the best regulatory tool. Where there are specific water quality issues that need to be addressed, Pollution Reduction Programs or Environmental Improvement Programs negotiated with licence holders may provide a much more targeted and effective way to deliver the desired water quality outcomes while at the same time considering the practical implications for the industry.

4.3 The Issues Paper does not present scientific evidence of water quality issues

The Issues Paper states that *"there is emerging evidence that additional measures are required to address the potential impacts of the constituents of saline mine water discharges (e.g. ionic composition, metals/metalloid contamination) across the state"*, with reference to the Hunter Catchment Salinity Assessment. However, the Hunter Catchment Salinity Assessment concluded that *"Experimental studies are recommended in order to fully understand the environmental effects of the different components of saline water discharged to the Hunter River catchment (e.g. ionic composition, metals/metalloid contamination, etc.)"* (NSW EPA 2013).

The EPA is planning further work in this regard, with a Pollution Reduction Program being proposed for mines in the Upper Hunter to gain a more complete understanding of the constituents of mine water discharge and what effect they might have on the Hunter River.

This is not sufficient evidence on which to base further regulatory measures on top of the Hunter River Salinity Trading Scheme, or to assume that LBL would be the most appropriate tool to apply.

5 Conclusions and recommendations

While the Issues Paper provides some information on mining-related emissions to air and water, given the potentially significant implications of including mining within the LBL scheme, NSWMC is concerned with the relatively simplistic analysis in relation to the LBL scheme's effectiveness to date; the environmental impact of mining-related emissions; the practicality of including mining within the LBL scheme; and the environmental benefits that including mining within the LBL scheme would deliver.

Overall, NSWMC believes that the Issues Paper downplays the effectiveness of the existing regulatory framework for mining operations; overstates the impact of mining-related emissions; and understates the complexities of applying LBL to mining operations.

NSWMC believes that applying the LBL scheme to mining would be ineffective, complex and inefficient, which could be reasons why there is no precedent of any similarly designed scheme being applied to mining operations.

Recommendations

- The EPA should not pursue the extension of the LBL scheme to include mining. The existing regulatory framework for mining is comprehensive and has been demonstrated to effectively deliver environmental improvements and meet environmental outcomes. Rather than being 'complementary' to other regulatory tools, the addition of LBL to the existing regulatory framework for mining risks complicating the regulatory framework and creating an ineffective, inefficient, complex and inequitable regulatory regime.
- The EPA should not pursue the extension of the LBL scheme to include fugitive dust emissions. The LBL scheme remains an inappropriate regulatory tool to apply to fugitive dust emissions, demonstrated by the lack any comparable precedent, and is unnecessary given the availability of more suitable regulatory tools.
- The EPA should not pursue the extension of the LBL scheme to include mine water discharges. There is no evidence to suggest that there is a gap in the existing regulatory framework for mine water discharges and the Issues Paper does not present a case for the extension of LBL to mine water discharges.
- The preparation of any proposal paper and supporting cost benefit analysis should be undertaken in close consultation with affected industries to ensure options and assumptions are realistic.

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