REGULATORY REFORM REVIEW

Report for the NSW Resources Regulator

Noetic Group

September 2018

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EXECUTIVE SUMMARY

This Report is the second report by Noetic Solutions Pty Limited (Noetic) on the regulatory reform initiated by the NSW Resources Regulator (the Regulator). The first report was published in December 2016, which was partly instigated by the Mine Safety Advisory Council (MSAC) Fatality Review in 2014. The purpose of this Report is to review the progress made with the reform project since 2016. The Report follows up on the *Incident Prevention Strategy* published by the Regulator in February 2016 and Noetic's review of the Regulator in December 2016. At the time of the December 2016 Report, the Regulator had for the most part identified *what* needed to be done and *how,* but implementation was in its early stages. In this review, Noetic can comment on the effectiveness of implementation of the *Incident Prevention Strategy*.

Overall, Noetic has seen widespread improvement in the policies, practices and processes used by the NSW Resources Regulator since 2016. This extends to the ability to articulate the strategy and its implementation across the organisation. In Noetic's engagement with the Deputy Secretary, Chief Compliance Officer and the executive team, we observed greater cohesion and collegiality compared to 2016. There is a marked improvement in the ability of the senior members of the Regulator's executive team to discuss, in common language, the rationale for what they are seeking to do, how they are going about it, the difficulties faced and how these may be overcome. We observed more of this shared understanding outside of the executive team, with a notably higher level of knowledge and interest in the issues faced by the Regulator compared with 2016 and earlier. We also heard their enthusiasm (measured by the variety of ideas they generated to improve further), which was not encountered in 2016. This also may reflect the changes in personnel that have taken place as part of the regulatory reform program.

The risk-based approach to regulatory intervention, which had commenced at the time of the previous review, is now further embedded. The Regulator has established a planned approach to its inspection activities that is underpinned by a fundamental view of mining hazards. This includes an effective risk-based approach to intervention with sites facing significant risks and compliance issues. This control-focused approach to regulation is foundational to the Regulator's *Incident Prevention Strategy.* While it has made significant progress in this area, this report identifies opportunities to further mature this approach and ensure that the effectiveness of risk controls remains a core component of regulatory activity. Additionally, and in support of the risk-based approach, the Regulator should further consider the value of some of its ongoing activities, namely where it is required to authorise and register plant items and designs.

Changes to the organisational structure and governance that were underway at the time of the previous review are complete, and related changes to processes and systems embedded. In our view, many of the governance activities and panels have reduced the scope for regulatory capture and increased the ability of the Regulator to strategically respond to industry trends and major compliance issues it identifies. A particularly important development is the effective embedding of a centralised incident notification assessment and response function (the Central Assessment Unit – CAU). The CAU has promoted appropriate and consistent response to incident notifications by the Regulator. We found evidence of improvements of the CAU in the timeliness and quality of its management of incidents.

This review also found that the Regulator's communication and engagement activities have matured in support of its regulatory approach. The publications, bulletins, reports, media releases and other communications products support the compliance outcomes targeted by its regulatory activity. As identified in the *Incident Prevention Strategy,* the Regulator has clearly communicated its priorities, increased awareness of health and safety risks, and promoted effective compliance.

In parallel to the above improvements, Noetic observed significant progress in developing the management and data tools required to support the *Incident Prevention Strategy.* The use of the ACES

software platform has increased the visibility of regulatory activity and improved accountability in following up inspection plans and incidents. The platform appears to support the consistent assessment and categorisation of incidents, which in turn has enabled the Regulator's intelligence capabilities. There is still considerable and ambitious work underway in the Regulator to provide more leading data on risk controls and the management of specific hazards, although some risks in the current approach are identified.

While this review identifies areas for improvement, Noetic has not identified any problems in implementing the reform program of which the executive team were not already aware. Furthermore, the Regulator does not seem complacent about the significant hazards that are a feature of the mining industry, especially underground mining. The more flexible and nuanced approaches to major issues, such as the gas exceedances at an underground coal mine and similarly difficult issues, reflect the Regulator's recognition that effective regulatory intervention requires a more proactive approach than what was previously applied.

In Noetic's view, based on our international experience of high hazard regulators in the resources sector, the Regulator is well on the way to being comparable with the best high hazard regulators in the world. This assumes the reform program continues and addresses the improvements already identified by the Regulator.

INTRODUCTION

In 2015, the NSW Resources Regulator ("the Regulator") began a major regulatory reform of the Mine Safety Branch. This was partly instigated by the Mine Safety Advisory Council (MSAC) Fatality Review in 2014 that identified the need to develop and improve regulatory processes. This review made the following recommendations:

- MSAC should consider how information on the implementation of risk controls for significant risks could be routinely collected, analysed and used to support a data led incident prevention strategy.

- Drawing on the discipline of human factors, including human and organisational factors expertise, identify the reasons which make it more likely that risk controls will be successfully and reliably implemented.

- Consider if the Regulator should explicitly focus on critical controls for significant risks as part of an incident prevention strategy.

The recommendations made in the MSAC Review formed the basis of a body of work intended to improve the strategic approach to mine safety in New South Wales. The *Incident Prevention Strategy* was published to guide this work by outlining the scope, timing and extent of the changes and improvements.

Noetic Solutions Pty Limited (Noetic) was contracted to undertake a review of the Mine Safety Regulatory Reform Program (the Program) in 2016. Noetic noted that substantial, high-quality improvements had been made to systems and processes that would support effective and efficient regulatory practice. However, at the time of the review, the Regulator was at a relatively early stage of the Program and Noetic could not form any definitive judgement about the program's success. Noetic also identified a number of opportunities for improvement in support of the Program. Annex A describes some of the features of the Regulator at the time of the 2014 MSAC Review.

The objective of this 2018 review is to assess the progress made since the last review, identify new areas for improvement and provide advice on how to achieve sustained, effective regulatory practice.

METHODOLOGY

In this review, Noetic aimed to answer the following questions:

- Is the Resources Regulator doing what it said it would in relation to implementing its *Incident Prevention Strategy* (February 2016)?

- To what extent does the *Incident Prevention Strategy* (and its associated activities) continue to be an appropriate course of action for a modern mining regulator?

- To what extent has the initial improvements to systems and processes, improved and supported the work of inspectors in the field?

The review was undertaken over five days from 2 July 2018 to 6 July 2018 at the Regulator's office in Maitland, NSW. Noetic reviewed documents provided by the Regulator in support of the above questions. A list of the documents reviewed is at Annex B.

In this period, Noetic interviewed a selection of management staff from the Regulator, as well as Senior and Principal Inspectors from the Mine Safety team. The interviews were a mixture of semi-structured individual and group discussions. A complete list of the Regulator interviewees is at Annex C.

At the end of the five-day review, Noetic provided a summary of the key findings to the Regulator's executive team and drafted a review report summarising its findings. The report is structured using key themes of the *Incident Prevention Strategy.*

1. RISK BASED INTERVENTION

1.1 RISK PROFILING AND HAZARD BURDEN ASSESSMENT

A key aspect of the risk-based intervention detailed in the *Incident Prevention Strategy* is creating an understanding of the risk profile at each mine site in NSW to aid in planning regulatory activity. Profiling assesses the risk resulting from health and safety hazards inherent to the type of operation. It assesses the likelihood of a hazard creating an unwanted event (based on inspectors' view and without consideration of risk controls already in place) and a consequence of this event (based on the expected number of people exposed to the hazard). This assessment produces a ranking of sites against each hazard, and priority ranking of the hazards relevant to each sector. This information is then used to inform planned inspection activities and provide a focus for its compliance activities.

Noetic reviewed the most recent risk profiling documentation (dated April 2017) for NSW Metex mines, coal mines, small mines and quarries. This included a demonstration of how the risk profiling process is incorporated into Mine Safety's ACES tool, which assists with planning inspection activity and collecting Mine Safety information.

In Noetic's previous review, we found that risk profiling documents were in draft and that the profiling process was applied to underground coal operations only. In this review, we observed in ACES that this profiling is used by Mine Safety Operations to prioritise sites and hazards in the inspection programs across all sectors. In particular, we understand that the use of risk profiling has supported a refocus of Mine Safety activities on areas of highest risk. A specific example is in relation to opal mining operations at Lightning Ridge, where Mine Safety carried out a compliance campaign on high hazard areas such as ground control. In this case, risk ranking provided a means of focusing on areas of highest risk and driving compliance in the most important areas.

Finding

The Regulator's development and use of risk profiling techniques effectively supports a risk-based approach to mine safety.

1.2 TARGETED ASSESSMENTS AND SITE INSPECTIONS

Noetic's 2016 Review reported the Regulator had developed a range of programs and processes including the Targeted Assessments Programs (TAPs), Planned Inspections and the Targeted Intervention Programs (TIPs). These provide a range of regulatory tools that give a rational, transparent and consistent approach to how regulatory resources are applied to inspection and audit programs. At the time of the 2016 review, these processes were at an early stage of implementation and it was consequently difficult to come to any conclusions based on operating experience. This next section of the Report discusses these programs.

TAPs are intended to assess "…how effectively mine operators are managing the principal hazards defined in the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 (WHS (M&PS) Regulation)."[1] Planned Inspections have a similar aim. The main difference between TAPs and Planned Inspections is in relation to the level of coverage of a mine's health and safety management and hence, the level of time and resources devoted to each program. TAPs are more detailed than Planned Inspections (Figure 1). The diagram below summarises the relationship. Given the similarity in process, greater attention is given to TAPs compared with Planned Inspections.
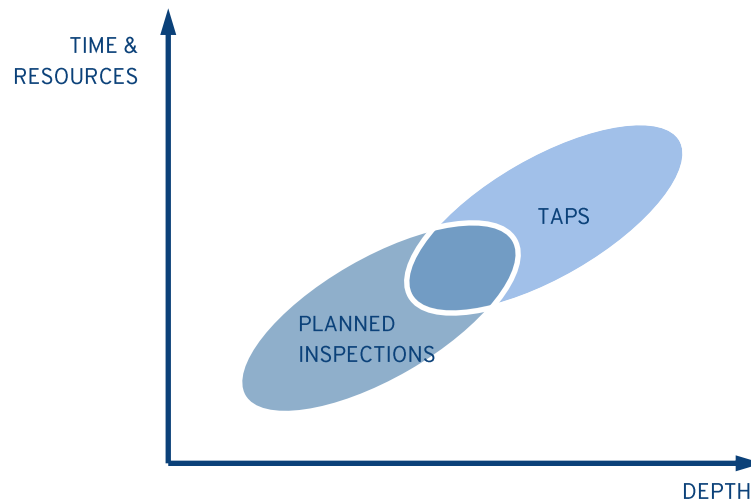

Figure 1. Comparison of Planned Inspection and TAPs.

TAPs are an important part of the Regulator's strategy to assess how well mining companies manage principal mining hazards "…as these hazards have the greatest potential for causing fatalities if not effectively controlled."[2] A feature of most principal mining hazards is that (fortunately) they only rarely eventuate. As a result, an important preventive strategy for both duty holders and regulators is focussing on how well controls are implemented and not waiting for an incident to occur as the consequences are severe. The TAPs program is intended to deliver this type of oversight by the Regulator.

To assess the program, Noetic interviewed selected staff, including the Chief Inspector, and examined a range of documents. These included but were not limited to TAPs on worker exposure to diesel exhaust emissions, fire and explosion at an underground coal mine and the findings from a series of TAPs conducted on Emergency Management[3]. Planned Inspection reports were also examined.

In the 2016 report, Noetic commented that the TAPs approach "… is an essential tool for a modern health and safety regulator."[4] We also observed that the early sample of TAPs were overly detailed, lengthy and did not always clearly identify the extent to which the critical controls were effectively implemented.

[1] See for example a report of the TAPs in relation to emergency management; NSW Resources Regulator 2017, *Consolidated report – Emergency management in underground mines*, NSW Department of Planning and Environment.

[2] NSW Resource Regulator 2016, *Fact Sheet: Targeted Assessment Program*, NSW Department of Planning and Environment, p. 1.

[3] 2018/00838 *Fire or explosion: Underground coal – Assessment tool, Ulan West underground.*

[4] Noetic Group 2016, *Regulatory Reform Review: Report for NSW Department of Industry, Mine Safety,* Noetic Group, Canberra, p. 9.

Important improvements to the TAPs process have now been made. TAPs are based on an analysis of the controls that are generally recognised as most important in preventing and mitigating the principal mining hazards. These are documented in bowtie diagrams.[5] A regulatory focus on the controls provides a means to directly check what prevents these significant hazards from eventuating. The bowties provide a documented, consistent basis on which to carry out TAPs. A similar approach is also applied to the other main proactive regulatory tool in use by the Regulator, namely Targeted Interventions (see section 1.3).

Although the TAPs have tangibly improved, they are still too detailed and lengthy. The examples examined, (fire or explosion and worker exposure to diesel exhaust emissions) were both more than 70 pages long. Although there is more emphasis on the risk controls in the documents, the relationship between what is reported upon in the TAPs and the controls identified in the bowtie is not always clear. Noetic were advised that this shortcoming had already been recognised and remediation was underway (including training). This was confirmed during our interviews.

Related to the improvements noted in the previous paragraph, Noetic is not sure that the balance between reviewing legislative compliance based on examining company documents and assessing the implementation of risk controls is appropriate. It appears that too much attention is given to the former and there is insufficient focus on control implementation. However, this is difficult to judge from an office-based assessment. Noetic has similar concerns in relation to Planned Inspections. The templates prepared for use by inspectors in the Planned Inspections are of good quality. However, we have not seen how they are used "in the field." We found from our discussions with senior managers and inspectors that these issues in relation to TAPs and Planned Inspections are understood and work is underway to refine the implementation of these programs.

Finding

There is now greater focus on risk controls. However, this can be further improved, and the complexity and length of the reports reduced.

Recommendation 1

Refine the implementation of TAPs and the Planned Inspection's to ensure a clearer focus on the risk controls.

1.3 TARGETED INTERVENTION PROGRAM (TIP)

Targeted Interventions are the third element of the Regulator's risk-based approach to regulation. They supplement TAPs and Planned Inspections discussed above. Targeted Interventions are typically undertaken following the Regulator identifying a change in a site's risk profile. This may be because of an incident, information obtained following Planned Inspections or other sources of relevant intelligence about the site. Although they take place after the Regulator determines that an issue or topic warrants

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[5] Bowties provide a visual representation of the linkages between a hazard, its causes and the controls to either prevent a risk occurring or minimise the consequences if it does occur. The Resources Regulator has developed bowties for principal mining hazards that include expected risk controls for each hazard.

further attention, they are still subject to a formal planning process within the Regulator. The steps for initiating, executing, reporting and review of a Targeted Intervention Program are documented.[6] In many ways, TIPs have similar characteristics to TAPs and Planned Inspections, such as: a review of relevant documentation, a site visit to check that systems and procedures to manage risk are implemented as intended, and that the workforce is competent and confident about the relevant risk controls.

Noetic was provided with a sample of reports on Targeted Interventions. These included Targeted Interventions related to gas management, gas outbursts and duties of officers in relation to a mine about to be reopened. These documents demonstrated significant improvements compared to the style of documents examined in 2016. The rationale for the Targeted Inspection is generally clear and the reports are (for the most part) self-explanatory and straightforward. The topic under consideration was clear, what was found well summarised and the evidence on which the conclusions were based was present.

Similar to TAPs, we found the relationship between the controls reported upon in the Targeted Intervention and the controls identified in the Regulator's bowties is not always clear. For example, the Target Intervention report for Metropolitan Mine[7] says that:

"The assessment team identified that the following critical controls are in place …:

Reduce gas content to below defined threshold limits

1. *Implement and comply with Permit to Mine process according to PHMP (normal, restricted or remote mining)*

2. *Identify outburst indicators and correctly respond*

3. *Identify outburst risk structures and correctly design gas drainage plan*

4. *Identify outburst indicators and correctly respond (according to outburst indicator TARP)*

5. *Personnel correctly don self rescuers and self-escape*

6. *Response personnel correctly don CABA and assist those unable to self-escape to escape*

7. *Account for all personnel and correctly respond to recovery process"*

However, the Regulator's own bowtie lists eight controls. Furthermore, six controls are listed under a heading of "Critical Controls" in Appendix 2 of the Metropolitan Mine report. The relationship between these three different lists of critical controls is not explained. We emphasise that it is the site's responsibility to identify critical controls, but equally the Regulator is expected to make an independent judgment of the adequacy of the company's assessment. This is where the Regulator's bowtie and control identification are valuable. They enable a considered discussion to take place between the Regulator and regulated companies where discrepancies in identified critical controls are encountered. However, the difference between the various critical controls is not explained. Noetic was advised at the start of this review that this is recognised (in relation to TAPs) and remediation is underway. It is assumed this will be applied to Targeted Interventions as well. Targeted Interventions seem to play a useful part in the approach to regulation and the small sample examined suggests they are well executed, subject to the improvements identified for Targeted Interventions as well as TAPs.

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[6] Resources Regulator procedure; *Planning and execution of targeted assessments, interventions and site inspections*, PROC 16/20, version 1.1.

[7] NSW Resources Regulator, *Targeted Intervention Report (TIP): Gas outburst, Assessment Tool, Metropolitan Mine*, NSW Department of Planning and Environment, p. 4.

Finding

There is greater rigour in the TIPs with the use of bowties and more focus on controls however the quality and consistency of their use can be improved.

Recommendation 2

Improve the linkages between the bowties, controls and the conduct and the reporting of the TIPs.

1.4 MANAGING MAJOR EMERGENCIES

Sections 1.1 to 1.3 discussed how the Regulator has made progress in addressing low probability but high consequence events such as fires and explosions through its program of regulatory interventions including TAPS and Planned Inspections (as well as investigations and other regulator activities such as publishing guidance). Because of the low probability of this type of event, experience in managing them when they do occur is inevitably rare. Their rarity and complexity also pose significant problems in coordinating an effective response. A significant factor in this arises from the nature of the multi-actor response (i.e. response beyond the site operator) that is typically required. For example, a variety of public agencies will be involved, such as: the Police, as the designated "Combat" or lead agency; the Resources Regulator; emergency services, including a mines rescue company; and a variety of other government and non-government organisations. As a result, although the Regulator has a pivotal role to play in this area as one of a variety of organisations required to actively cooperate in an effective response if the worst outcome should occur. We examined the extent to which the Regulator had considered this topic, given that an effective response strategy is a natural complement to the effective prevention strategy outlined in the *Incident Prevent Strategy*.

Noetic found that the Regulator has identified emergency management as a regulatory issue, and this is reflected in its recent activity. For example, we found that the Regulator had carried out a TAP covering site emergency plans and published the results in August 2017. Amongst other things, this found a need for mine operators to improve risk assessments, consultation and implementation of controls.[8] Several improvement and notice-of-concern notices were served. Noetic also found that the Regulator was re-considering the learnings from previous disasters such as Moura #2[9] amongst others, as well as the learnings from exercises in NSW and Queensland. Both the earlier disasters and the exercises pointed to the need to carry out further work on a wide range of topics. These topics include, but are not limited to, the type of equipment provided for escape and rescue, organisational methodologies in relation to escape and rescue, and how the Regulator interfaces and cooperates with other organisations such as the Police.

At the time of writing, these issues were under active consideration within the Regulator. From the material seen, including TAPs and incident investigations (some of which were still underway), Noetic

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[8] NSW Resources Regulator 2017, *Targeted Assessment Program: Consolidated report – Emergency management in NSW underground mines*, NSW Department of Planning & Environment (PUB17/512).

[9] Moura #2 was a mining disaster that occurred in August 1994 at the Moura No 2 underground coal mine in Queensland. An initial explosion, followed by a more violent second explosion, resulted in the deaths of 11 workers. More information can be found in the Wardens Inquiry report: https://publications.qld.gov.au /storage/f/2014-06-13T04%3A41%3A45.893Z/moura2.pdf.

believes that this is an important topic for the industry as a whole and will require careful discussions with other agencies and industry. To facilitate this, we suggest that the Regulator, once more detailed work has been done, publishes a report or discussion paper on this topic to canvass those issues which require broader action and involvement beyond the Regulator alone.

Finding

The Regulator has identified the need to improve emergency management and the importance of doing so in conjunction with other stakeholders including (but not limited to) the Police.

Recommendation 3

Develop an internal position paper on this topic and consider how the broader range of stakeholders are engaged once the Regulator has defined its approach.

2. STRUCTURAL AND ORGANISATION REFORM

2.1 GOVERNANCE MODEL FOR COMPLIANCE MATTERS

The 2016 Review observed that "…much of the structural and organisational changes were a 'work in progress'"[10] including the planned formation of a newly structured executive leadership group. However, some of these changes including the formation of the Central Assessment Unit (CAU) and the Safety Incident Review Panel (SIRP) had taken place, albeit only shortly before the 2016 Review. In this Report we discuss the new structures and how the governance changes have worked out in practice.

Before the changes instituted in 2016 to form the CAU and the Safety Incident Review Panel, it was normal practice for each mine site to have an inspector responsible for providing the principal point of contact between a mine site and Mine Safety including the reporting of incidents. As reported in 2016, the absence of a centralised system, "… did not permit senior personnel to have a complete picture… and as a result, it was difficult to analyse … trends… [and]… difficult to take a more strategic view."[11] A specific review of how the CAU functions is provided in section 2.2.

The arrangements put in place in 2016 worked well and have continued to evolve. The system now involves the Daily Review Panel (DRP)[12], the Review and Allocation Panel (RAP)[13], Compliance and Enforcement Panels (CEP)[14] and the Strategic Review Panel (SRP)[15]. Documented terms of reference are in place for each of these governance groups.

We interviewed many of the members of these committees. The prevailing opinion was that the system developed since Noetic last reviewed the organisation, is more professional and brings the appropriate skills and knowledge together at different stages of the Regulator's involvement with those it regulates. As a result, there is much less scope for suggestions of regulatory capture as no one person is making decisions on what action is taken. In addition, a more strategic view is now taken which integrates

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[10] Noetic Group 2016, *Regulatory Reform Review: Report for NSW Department of Industry, Mine Safety,* Noetic Group, Canberra, p. 11.

[11] *Ibid*, p. 11-12.

[12] The DRP meets daily to undertake a technical review of all notified incidents and allegations received by the Central Assessment Unit. It is chaired by the Principal Inspector Central Assessment and comprises the Principal Inspectors of Mining, Mechanical and Electrical Engineering.

[13] The RAP meets weekly and consists of senior Mine Safety staff and is chaired by the Director Regulatory Services. RAP reviews and allocates an incident (or allegation) to the appropriate part of the Regulator for action.

[14] CEPs handle ongoing case management, one of which focuses on work health and safety laws and the other on the Mining Act. The CEP panel meets fortnightly and consists of the Chief Compliance Officer, Chief Inspector and the Directors of Regulatory Services, Strategy and Engagement, Business Operations and Assurance, Compliance Operations and the Manager Major Investigations. The CEPs are chaired by the Director Regulatory Services (WHS) and Director Compliance Operations (Mining Act).

[15] SRP takes a more strategic view and evaluates and integrates information obtained from the full panoply of audits, inspections, investigations and other matters and information that comes to the attention of the Regulator. This committee meets fortnightly and is chaired by the Chief Compliance Officer.

information from incidents, planned regulatory interventions such as TAPs and Planned Inspections and investigations. Senior staff also commented how much more integrated the executive team now is. From the review of the documented processes and interviews with personnel, the Regulator now has an effective governance system which helps to ensure the Regulator takes the action appropriate to the circumstances in a more consistent manner.

Finding

The Regulator's governance system has continued to improve and evolve since the 2016 review and it effectively supports effective regulatory intervention.

2.2 CENTRALISED INCIDENT NOTIFICATION MANAGEMENT

In Noetic's previous review, we identified that the creation of the Central Assessment Unit (CAU) as a centralised incident recording and response mechanism was an important development since it encourages consistent treatment and a holistic view of notified incidents. We reviewed the current function of the CAU, its procedures for handling incident notifications and discussed the embedding of notification review and response procedures into Mine Safety operations with the head of the CAU.

The procedures describe how incidents notified by phone are classified by the CAU[16], who determine an appropriate response in accordance with the procedures. We also discussed how incident notifications are reviewed at the Daily Review of Notifications, how the weekly summary of incidents is prepared and published, and how the CAU makes recommendations on investigation levels (such as a Major Investigation, an on-site investigation or a desktop assessment). The level of investigation and other actions taken are then reviewed by the Review and Allocations Panel (RAP). The Regulator's response is based on incident severity, whether or not incidents are repeat cases, if there is an ongoing risk exposure or whether they have reason to believe an incident was incorrectly reported.

The daily review and ongoing monitoring of notifications in the Assessment Compliance and Enforcement System (ACES) encourages comprehensive assessment and processing of incidents to provide timely and useful information about health and safety performance across NSW. This is evidenced by fact that the average time taken to 'close out' an incident response and investigation has reduced significantly since the 2016 review[17].

Finding

The CAU provides effective and consistent management of incident notifications.

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[16] NSW Resources Regulator, Procedure: *CAU Receiving incident notifications by phone*, p. 6 (PROC16/31).

[17] For the past four months, the average number of days it takes the Regulator to close incidents has been under 40. This number was down to 9.5 days in June 2018 (the most recent result at the time of Noetic's review). By contrast, it took on average over 200 days to close out some incidents in 2016.

2.3 LICENSING AND AUTHORISATION

Part of the Regulator's role is to authorise the use of certain plant, materials or practices by providing licences or other approvals. These activities are legislated by the *Work Health and Safety Act 2011, Explosives Act 2003*, *Mining Act 1992* and other legislation. We were informed that, since Noetic's report in 2016, the regulator has undertaken an internal review[18] of its authorisation activities, which produced a series of observations and recommendations. This section reviews the observations and recommendations of the *WHS authorisation activities review project* (the internal review) and the extent to which the authorisation activities support the *Incident Prevention Strategy*'s risk-based regulatory intent.

Some examples of authorisation activities include:

- licensing for "high risk activities" such as repairing or modifying of plant components that protect against or prevent explosions[19]

- providing a character reference for applicants for a Blasting Explosives User Licence to oversee the handling and use of explosives

- authorising site exemptions for specific aspects of the Work Health and Safety Regulation 2017 or Work Health and Safety Regulation (Petroleum and Sites) 2014

- registration of high risk plant items and their design (such as booster fans, detonators, winding systems, etc.).

The internal review describes the strong similarities between each authorisation activity in terms of what is required of the Regulator. However, it observes considerable differences in how the Regulator carries out its role and how decisions are made. It also suggested that the administrative processes for some authorisations placed considerable burden on the Regulator's resources (particularly individuals with specific technical expertise) and had remained unchanged for several years. The internal review also suggests that in some cases, such as registering plant items and designs, the regulator is performing detailed assessment of technical specifications, which the legislation does not require.

The internal review describes a range of operational, financial and reputational risks that are associated with some of these authorising activities. Of particular note, there is the potential that any activities that involve technical assessment of a plant item or design, inevitably leads to some acceptance of risk by the Regulator (i.e. that the Regulator is perceived to have endorsed a design or undertaking). This is an approach which, as the internal report states, "conflicts with the overall approach and nature of the legislative framework (which places responsibility for managing risk on the entity or individuals creating the risk)".

As a result of the internal review, changes are underway which will improve these authorisation processes. These will go some way to reducing the resourcing requirements for these activities and allowing resources to be diverted to "higher value" regulatory activity. However, based on our brief examination of this topic, a more fundamental review is warranted to determine which, if any, of these activities the Regulator should be engaged in to most effectively enact the risk-based approach described in the Incident Prevention Strategy.

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[18] NSW Resources Regulator 2017, *WHS authorisation activities review project: Observations and recommendations*, NSW Department of Planning and Environment.

[19] NSW Resources Regulator, *Licensed activities*, available at: https://resourcesandgeoscience.nsw.gov.au/ miners-and-explorers/safety-and-health/applications/high-risk-activity-license.

Finding

The Regulator has reviewed some of its functions to authorise certain plant, materials and practices. This internal review identified potential regulatory risk with its current activity, and we observe that there may be additional issues with its current approach.

Recommendation 4

Consider further reviewing the Regulator's role in authorising particular plant and practices to ensure that regulatory intervention is focused in areas of highest risk.

3. STAFF SKILLS DEVELOPMENT AND TOOLS

Noetic reviewed how the Regulator develops its staff capability in support of the *Incident Prevention Strategy*, primarily by examining the training it provides.

Since Noetic commenced working on the Mine Safety Regulatory Reform Program, we have noticed tangible increase in the knowledge and confidence amongst members of the senior leadership team about the organisational changes and improvements in capability (described elsewhere in this report) that have eventuated. This extends to the Principal Inspectors who understand the rationale for the changes and how they improved organisational capability. There is an evident interest and enthusiasm in continuing to make improvements and strong understanding of the current issues facing the Regulator.

Given that we cannot easily examine the causes of this improvement in leadership and understanding, we have focused specifically on training in this section.

3.1 STAFF TRAINING

Developing the skills and knowledge of the Regulator's personnel is an essential part of the regulatory reform project. Noetic's 2016 Report reviewed the training planned to support the reform process. At the time of the 2016 Review, we were advised the training program described in the *Incident Prevention Strategy* was to start.

Noetic found that the Regulator has training programs and tools which have or are in the process of being implemented. These include:

- training to improve the quality of enforcement notices issued under workplace health and safety legislation
- human and organisational factors (HOFs) training to develop the skills of inspectors and other key staff on human error and other linked topics
- induction and onboarding program for newly appointed employees
- Certificate IV and Diploma in Government Investigation
- WHS Framework awareness project intended to improve understanding of the workplace health and safety framework
- an interactive inspector's manual to improve inspector's accessibility to information and guidance
- critical control training to improve inspector's knowledge of the barriers which have the greatest impact on the control of catastrophic risk.

In 2016, we were advised of a project to develop a compliance assessment decision tool (CADT) to assist inspectors in making consistent and transparent compliance decisions. Development of the tool is complete and Noetic reviewed the finished document. Although complete, we note that the need for this tool has been vastly diminished with the improved governance processes and inspector training as detailed above..

The combination of training in the use of enforcement notices and stronger managerial leadership has led to significant improvements in the quality of the drafting of notices and a concomitant reduction in the number of notices being challenged. Similarly, the Regulator has delivered training in HOFs. The impact of this training is evident in the degree to which HOFs are explicitly covered in incident reports and publicised

in the factsheets on human factors (see section 4.1). Applying HOFs in TAPs and Planned Inspections is more difficult and has proved less successful in practice and integrating HOFs into these activities will require further work. The induction and onboarding program has also begun, with the first sessions conducted in June 2018. All the other training programs and processes mentioned above are expected to be underway by the end of the year with delivery providers identified and program content in development.

Noetic was advised of an innovative training program entitled *Learning from disasters*, which is targeted at mining personnel seeking a practising certificate for certain statutory positions in the mining industry. The goal of this training is to ensure the lessons learnt from past disasters are not forgotten. An important development, in Noetic's view, is the incorporation of this program into the Regulator's training. Major disasters are rare and as a result are (fortunately) outside of the normal experience of most industry workers. Unfortunately, this rarity reduces individuals' knowledge of what happened in the past and over time can reduce the care with which the risk controls are applied.

Finding

The Regulator has developed suitable tools and training to support the regulatory reform program and the tools are being implemented.

4. COMMUNICATION AND ENGAGEMENT

The Resources Regulator's *Incident Prevention Strategy* describes how the Regulator will use communication to industry on "high risk areas and risk priority to encourage improvements and the adoption of best practice". Effective communications can enhance the efficacy of regulators by taking the learnings from specific regulatory interventions, such as investigations, Planned Inspections and TAPS, and broadcasting them to a wider audience. In effect, they act as a multiplier of the actions taken by the Resources Regulator in individual cases by bringing the information to the attention of a wider audience, increasing awareness of health and safety risk and promoting compliance.

We reviewed the extent to which the Regulator is achieving this objective as outlined in the June 2018 *Communications and Engagement Strategy*[20] and May 2017 *Public Comment Policy*. We examined several public communications published by the Regulator, including media releases, publications and communications on activities. The activities covered include planned and undertaken inspection and compliance activities, incident investigations, enforcement undertakings and other engagement with sites and duty holders. We also specifically examined the communication of compliance priorities and how the Regulator has sought to achieve compliance outcomes against these stated priorities.

4.1 COMMUNICATION AND ENGAGEMENT STRATEGY AND PRODUCTS

In Noetic's 2016 Review, we examined a range of the documents produced by the Regulator and concluded that "Mine Safety has developed useful reporting mechanisms…" and suggested "…further improvements can be made such as describing … controls that failed … in" reports on investigations.

The June 2018 *Communications and Engagement Strategy* documents the Regulator's objectives and overall approach to communication. The stated objectives of this strategy are to ensure effective engagement with stakeholders on regulatory issues, proactively share information to improve regulatory performance, identify and respond to emerging issues and to do this in an accurate and consistent manner.[21] This is to be done principally by producing and disseminating appropriate material. The following materials were reviewed:

- Three factsheets on human factors in mining, each of which detailed learnings from a fatal accident presented in a two-page format intended to facilitate their use as training aids within companies.

- "Compliance Priorities Outcomes", which are summaries of projects intended to improve compliance in specific risk areas, such as control of bench heights and plant used in hazardous zones. The Compliance Priorities Projects are examined in more detail in section 4.3.

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[20] NSW Resources Regulator 2018, *Communications and Engagement Strategy*, NSW Department of Planning and Environment.

[21] Ibid, p. 4.

- "Quarterly Safety Report – January to March 2018[22]" published 12 June 2018. This is a substantial document of 62 pages which provides a wide range of information by individual mining sector. It provides statistical data, results from the Regulator's proactive safety interventions, incident investigations as well as examples of good practice.
- Investigation reports such as the investigation into a serious injury following a fall from an articulated dump truck.[23]

We were impressed by the quality of these documents. This included layout, the use of diagrams and photographs, the detailed content and usability of the content for the target audience. The tone of the language is appropriate for the target audience, including mine workers at all levels. The language avoids using a hectoring or patronising tone which can be common in safety related publications and can inhibit the understanding of key messages. The Regulator has made improvements to the published incident investigations as suggested in 2016 and further, incident reports now explicitly address human factors.

Finding

The Regulator delivers high quality information on risks, how they are controlled, the results of its regulatory interventions as well as incident investigations.

4.2 PUBLIC COMMENT POLICY

In addition to the *Communication and Engagement Strategy*, the Regulator's communication activities are also guided by of the activities that support the Regulator's *Public Comment Policy*, published in March 2017. We reviewed this policy, public statements and media releases made by the Regulator. These cover areas such as major prohibition or infringement notices issued, prosecutions commenced, major investigation outcomes and important guidance. These activities are important to supporting the effectiveness of risk-based regulatory intervention as they demonstrate the Regulator's objectives to industry and the community. These communications also support compliance outcomes by ensuring that the Regulator can demonstrate effective use of its enforcement tools to achieve regulatory outcomes. For instance, we heard that, because of the significant and well-publicised regulatory intervention at the Appin Colliery, the Regulator was engaged voluntarily by another site dealing with similar risks, inviting the Regulator's guidance and intervention in their management of hazards related to gas. Our review of the public comment policy and use of compliance priorities suggest that the Regulator is appropriately supporting its intervention strategy with public communication and engagement.

From both its communication and engagement products and its public comments, we conclude the Regulator has made strong and effective progress in executing the communications aspect of the *Incident Prevention Strategy*. The current approach to communication and engagement supports their strategy by both appropriately sharing knowledge and experiences across the industry and clearly communicating the intent of the Regulator's enforcement activity.

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[22] NSW Resources Regulator 2018, *Quarterly Safety Report January to March 2018*, NSW Department of Planning and Environment.

[23] NSW Resources Regulator 2017, *Investigation Report: Report into the serious injury of a mine worker on 1 February 2016 at the Sibelco Salt Ash Sand Plant*, NSW Department of Planning and Environment.

4.3 COMPLIANCE PRIORITIES PROJECTS

A key objective of a regulator is to communicate its view of the high-risk areas and risk priorities for the industry. It is important for the regulator to then demonstrate that its activities reflect its view of risk, and that through its action, to ensure that these risks are appropriately managed. We reviewed the NSW Resources Regulator's Compliance Priorities projects in support of this principle.

Compliance Priorities are published by the Regulator as a clear set of enforcement priorities to be achieved either in within a six-month timeframe or on an ongoing basis. They are treated internally as defined projects, and we viewed internal project plans which describe the context, objectives and key activities that will address these priorities. Externally, these Compliance Priorities are documented on the Regulator's website, along with additional focus programs such as Targeted Assessment Programs. Priorities are accompanied by justification of the priority (such as concerning incidents or high inherent hazards) and an indicator of future regulator activity to drive compliance.

The Compliance Priorities Briefs reviewed detail a range of activity to improve regulatory compliance. This includes:

- ▪ 'Compliance Campaigns' which target specific hazards, sites or regions, such as the Lightning Ridge compliance operation

- ▪ extensive literature review or desktop review of mine's hazard management plans, such as the review carried out in support of the heat stress compliance program

- ▪ published or updated guidance sheets, fact sheets, tools and other resources, such as online videos for issues related to health monitoring

- ▪ industry engagement in workshops or seminars, such as the workshop held on 29 November 2017 in support of the 'Plant used in hazardous zone' Compliance Priority

- ▪ reports detailing the findings of TAPs or TIPs or other activities carried out as part of the program.[24]

The outcomes of the Compliance Priorities projects are published on the Regulator's website.[25]

Based on a review of the internal plans and published outcomes, these Compliance Priorities support the *Incident Prevention Strategy*'s intent by using a range of approaches to drive compliance. Of note is the Lightning Ridge compliance operation's incorporation of a variety of post-reform regulatory tools. The

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[24] NSW Resources Regulator 2017, *Consolidated report – Gas outbursts risks in longwall mining*, NSW Department of Planning and Environment.

[25] NSW Resources Regulator n.d., *Compliance activities and reports,* viewed 23 July 2018, available at: https://www.resourcesandgeoscience.nsw.gov.au/regulation/compliance-and-enforcement/compliance-reports.

operation included clear communication of the compliance areas in focus and planned activities, comprehensive inspection activity on those focus areas and communication of the findings and outcomes of the compliance activity to all stakeholders.[26] Since this operation, it is understood that the Regulator has initiated further compliance activity focused on opal mines based on its risk profiling for hazards in the sector and the results of previous compliance activity.

We conclude that the Regulator is using a broad range of tools to support compliance activity. These include communicating its priority risk areas and its compliance expectations, as well as providing guidance, analysis and feedback to duty holders.

Finding

The Regulator is appropriately communicating its Compliance Priorities and supporting these focus areas with a range of activities to drive compliance.

4.4 COMPLIANCE-RELATED COMMUNICATION WITH COMPANIES

The Regulator has improved its regulatory approach to engaging with companies where potentially serious situations become apparent at sites they operate. Hitherto, the Regulator's approach would conventionally involve an inspector (or inspectors) dealing predominantly with the site were the serious situation existed, whether or not more senior representatives of the company were based elsewhere. For example, the most senior person at a site might be a mine manager but who reported to a general manager at the head office in another location. The Chief Executive Officer (CEO) could be at a third location.

Where a serious situation is identified (which is not necessarily an accident), the Regulator now forms an Incident Management Team (IMT) to consider how best to deal with the situation. Amongst other things, this decides how best to communicate with the company and at what level to achieve the required regulatory outcomes. This may mean that in addition to the traditional onsite focus by inspectors, others in the Regulator may engage with other roles in the company's management team, such as Chief Risk Officers, members of the executive leadership and Board members depending on the issue and its significance.

This more nuanced approach to engaging with companies has a number of benefits, such as providing a more direct line of communication to senior executives who may not have been appropriately informed of site level issues. This can result in more effective and speedier resolution of compliance issues. We were provided with a number of examples of how the Resources Regulator has adopted this approach successfully. We conclude this is a valuable addition to the range of tools and techniques, developed and implemented by the Regulator since the 2016 Review. This is another indication of an improving and maturing regulator.

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[26] NSW Resources Regulator 2017, *Compliance priorities outcomes, July-December 2017*, NSW Department of Planning and Environment.

Finding

The Regulator has improved its approach to communicating with companies on compliance issues by more accurately targeting its communications so that they are appropriate for different levels of a company's organisation.

5. DATA COLLECTION AND ANALYSIS PROCESSES

A key aspect of the *Incident Prevention Strategy* is a focus on quality data to support risk-based regulatory intervention. Since Noetic's last review, the following initiatives have been undertaken:

- improved use of the ACES in support of planning, managing and recording regulatory activities (which had been in place at the time of the previous review)
- development of an improved platform to supersede ACES (ACES 2.0)
- development of a structured classifications to improve safety data (UniQuest taxonomy project).

We saw a demonstration of how ACES, how incident data is recorded and the planning of Mine Safety activity. We also reviewed documentation relating to the ACES 2.0 Business Systems Project, including Project Plans relevant to Risk Assessments (or risk profiles), Assessments and Event Notifications (such as activities, authorisations and incidents). We then spoke with the ACES 2.0 project team to discuss testing, implementation and scheduled completion of the project.

Although the project is still underway, we reviewed the progress made in the taxonomy project to support consistent structured data for trend analysis on incidents and causal factors.

5.1 ACES – CURRENT STATE

In 2016 ACES was introduced as the primary data recording tool, with data being migrated from the legacy system COMET. ACES is an important tool for planning and supporting inspection activity and is a key source of intelligence and management information. We reviewed documentation for ACES and explored its functionality, including its risk profiling information (see section 1.1), incident notification response and management (section 2.2), and management of inspection activity.

Although it is soon to be updated to the ACES 2.0 system, ACES has been embedded in the in the way Mine Safety is managed. The move from the previous system to ACES has been supported by increased diligence in Mine Safety reporting, allowing the effective recording of inspection activity and site history. It is understood that prior to introducing ACES, inspection activity and key correspondence was not comprehensively reported for each site. ACES has also supported effective planning and decision-making in relation to planning inspections based on risk and in response to notifications and incidents (see section 2.2). For instance, when the CAU must determine an appropriate response to an incident at a particular site, it can readily view the site's prior incidents and compliance notices.

Finding

The use of ACES in planning and recording regulatory activity has supported more accountable and data-led regulation in Mine Safety.

5.2 DATABASE IMPROVEMENTS – ACES 2.0

In our discussions with the ACES 2.0 project team, we were informed that the project is on track for completion by November 2018. At the time of this report, the majority of the system's build is complete

and user acceptance testing is the key component of the remaining work. There is a provision for user training with the introduction of ACES 2.0 to ensure the system is understood by the Mine Safety team and other end users. The project team also emphasised the ability of the system to be modified according to the Mine Safety Inspectorate's approach and how its taxonomy develops.

Based on our review of the Regulator's spotlight reports and other intelligence sources, the current approach to trend analysis on incident data is appropriate and is clearly supporting the Regulator's risk-based approach to regulation. However, in order to effectively provide leading metrics for incident prevention (particularly for low frequency, high consequence events), inspection findings on the effectiveness of controls must be captured as data. Noetic's review of the development of ACES 2.0 suggests that it is capable of supporting the appropriate collection and analysis of control-related data from inspections. This is an important component of overcoming the limitations of relying on intelligence based on incident notification data, which often does not adequately capture trends relevant to fatal or catastrophic incidents.

Findings

The Regulator is planning improvements to ACES that will support more useful control related data and improve its intelligence capability.

5.3 INCIDENTS, CAUSES AND CONTROL TAXONOMY

A key value proposition of ACES 2.0 is its ability to collect Mine Safety data by providing a classification system for health and safety information. We reviewed progress of the project underway with the University of Queensland to develop nomenclature and taxonomy related to incidents: their context, causation of incidents and the controls. Also reviewed were draft taxonomies and bowties related to two hazards (Operating vehicles/mobile plant, and Ground and strata).

The project has thus far produced comprehensive draft classifications for site information, hazards, events and controls to collect important incident-related data. The project has produced suggested reporting forms for data collection using this taxonomy. The currently defined ACES 2.0 reporting forms cover important control-related information and, if appropriately collected, such data will establish whether identified controls are implemented and monitored effectively. There is also a considerable amount of proposed detail on human organisational factors, risk management system factors and other additional insights. This represents a significant long-term opportunity for Mine Safety to expand its data sources used in incident prevention from incident-related data to Planned Inspections and TAPs data. Gathering comparable information on control performance across various sites will provide a rich source of data to inform Mine Safety of how well risks are managed on site, as incident investigations are only a small sample of all available information that can be collected on risk controls. However, based on our review of draft forms for data collection on control performance, we believe that the further consideration should be given to the practical collection of this data at site. The currently defined forms are highly detailed and, without testing or applying appropriately considered business rules for their use by inspectors, we believe they may be too onerous to complete in the course of incident investigation and inspection activities. This could lead to in incomplete or unreliable data if inspectors cannot accurately assess all aspects required by the forms.

In discussions with the intelligence team, the ACES 2.0 project team and senior leadership, we were informed that the above issues with overly detailed data collection have been identified. Additionally, we were also informed that engagement with the taxonomy project by inspectors had been limited, leading to the project developing without adequate input from inspectors and other staff who will collect the

information 'in the field'. Although we understand that this issue was being addressed whilst this Report was being drafted

Based on the above, there is work underway to align inspection practices and outcomes with intelligence functions and information systems. While this work is positive and supports the intent of the *Incident Prevention Strategy*, there is a risk that concurrent initiatives could cause confusion and additional resourcing burden if final implementation is not thoroughly planned and coordinated.

Additionally, if the data produced from this system is not accurate or practical for inspectors to apply, there is also a risk that the Mine Safety team and the intelligence team develop diverging approaches to using data and assessing risk. While there will always be a need for inspectors and specific Mine Safety teams to perform their own ad hoc data analysis, we understand that the Regulator intends to ensure that inspection and incident data analysis is centrally governed and undertaken primarily by the Regulator's intelligence and analysis function. We also understand that action is already underway to better integrate the two business areas, for example, having an analyst attend the CAU's daily incident notification review meeting.

Managing intelligence and analysis centrally should support more robust, consistent and meaningful data analysis in support of the *Incident Prevention Strategy*. For this to succeed, particularly in light of the work identified in incident and control taxonomy, we suggest that the Regulator considers action to ensure that:

- any inspection and incident data collection in ACES 2.0 is tested with Mine Safety Inspectorate so it is not burdensome, impractical or conducive to unreliable data from inspections and incidents

- inspectors understand and can use the Incident Assessment, Planned Inspection and TAP forms in ACES 2.0 in order to provide the results of their activities in a structured and useable form for evaluation and data analytics

- the evaluation and data analytics team remain closely engaged with Mine Safety to provide insights that can inform its priorities and support in taking a risk-based approach to regulatory activity.

Finding

In support of risk-based intervention, the Regulator has undertaken an ambitious program of work to improve how it classifies incidents and control-related data. However, there is a risk that improvements to data quality and collection do not align with the Inspectorate's approach to assessing risk and gathering associated data.

Recommendation 5

Review the approach to the taxonomy project, ACES 2.0 and any changes to regulatory activity to ensure that they are aligned and will produce quality data.

An example of a suitable approach may be to set up 'pilot project' focused on one principal mining hazard package, where the Mine Safety team and the Strategy and Engagement team jointly establish:

- a bow tie with common critical controls that are applicable across comparable mines

- a simple, shared understanding of control verification on site (i.e. is the control in place? is functioning as intended?)

- inspection and incident reporting requirements which capture this information and report on it in comparable formats

- an intelligence reporting format that can clearly convey the performance of these controls in a way that is comparable across sites and time.

Testing the above approach with a series of Planned Inspections and TAPs will help clarify roles, test business processes and inform training requirements. This will significantly benefit the roll out of the taxonomy project, the ACES 2.0 roll out and the ongoing implementation of a control-focused risk approach in incident investigations and inspections.

6. CONCLUSION

The Regulator has implemented most of the tools and processes foreshadowed in the *Mine Safety Regulatory Reform Incident Prevention Strategy* published in February 2016. Work is well underway on the rest. The changes are far reaching, encompassing both "back office" and "front line" activities. In 2016, much of this work had started but was either incomplete or underway and there was relatively little operating experience with the new style of working. However, much of the *Incident Prevention Strategy* is now in place and the Regulator has significant operating experience with the new tools and processes. It has also made substantial changes to the organisational structure and how certain tasks, such as the management of incidents and other legally required notifications, are case managed.

The important changes which the Regulator has made, whether field work or back office, are all interlinked. For example, the regulatory intervention program is based on a logical analysis of the inherent hazards and more specific site (or company) risk analysis carried out back in the Regulators office. This approach considers the variety of "inherent" hazards evident in the industry (i.e. underground mining is inherently more hazardous than open cut mining). Similarly, site and company risks are also taken into account.

The ability to publicly explain this hazard and risk-based approach to resource allocation is, in our view, a key marker of a competent regulator. It should be borne in mind that the NSW mining legislation (in common with other regulatory regimes) puts the onus on those in direct control of hazardous activity to manage the risk. The regulatory body has "powers" to visit sites, investigate incidents and stop activities, but the legislation does not generally say *how* the Regulator should carry out its role nor how to prioritise its efforts. The priorities it chooses can then influence where companies apply their resources to best manage risk. Therefore, it is very important that the Regulator's approach is clear, transparent and, therefore contestable if need be. The approach adopted by the Regulator demonstrates its understanding of the wide range of hazards and risks faced by the mining industry. These range from the rare disasters to more frequent fatal accidents, occupational health exposures such as respirable dust to the more frequent occupational accidents common to many workplaces. The approach to addressing these diverse risks by the Regulator is clear, based on sound reasoning and formalised in procedures.

Compared with the situation in 2016 (and especially 2014), the Regulator now has a much clearer understanding of its purpose, how this can be achieved, an aligned and enthusiastic leadership team and has defined and implemented its processes. Much of the results of the improved approach are now visible to the industry and wider public in the documents published by the Regulator on the internet. There is still more to be done, as described in this report. However, the Regulator is well on its way to becoming a safety regulator comparable with good practice high hazard regulators in other parts of the world.

List of Recommendations

1. Refine the implementation of TAPs and the Planned Inspection's to ensure a clearer focus on the risk controls.

2. Improve the linkages between the bowties, controls and the conduct and the reporting of the TIPs.

3. Develop an internal position paper on this topic and consider how the broader range of stakeholders are engaged once the Regulator has defined its approach.

4. Consider further reviewing the Regulator's role in authorising particular plant and practices to ensure that regulatory intervention is focused in areas of highest risk.

5. Review the approach to the taxonomy project, ACES 2.0 and any changes to regulatory activity to ensure that they are aligned and will produce quality data.

ANNEX A: THE REGULATOR IN 2014: THEN AND NOW

Introduction

It is difficult to judge the amount and quality of change discussed in this Report without providing some context or "baseline." This short addendum to the main Noetic Report describes some of the features of the Regulator, (then known as Mine Safety) as seen immediately prior to the start of the reform process in 2014. This will include how the Regulator addressed low probability but high consequence hazards (such as underground fires and explosions); the Regulator's governance structure; the extent to which sufficient focus was applied to the implementation of risk controls as part of the risk management strategy; and finally, data collection and analysis.

The Balance between Reactive and Proactive

In 2014, it was difficult to determine the rationale for resource allocation between reactive work, such as responding to incidents in which people were injured or other so called near misses, compared with proactively assessing how well mining companies are managing the hazards and implementing the required risk controls. The difficulty in determining this balance between reactive and proactive work, was partly due to the quality of the then repository for data (COMET) but also due to the absence of a clear strategy in this area.

In 2014 it appeared too much effort was expended on reactive at the expense of proactive work. There is no one right answer to this regulatory dilemma. However, high hazard industries, including mining, are susceptible to incidents that are very rare but can have catastrophic potential consequences such as underground fires or explosions. One such example is the explosion at Appin Colliery in July 1979 which resulted in the death of 14 workers. In contrast, most reported frequently incidents typically affect one person or two at most and are unrelated to these major hazards. The rarity of the major incidents such as explosions can lead to a loss of focus on them. Both low frequency and high frequency incidents are important and are part of the regulatory regime, but a balance between the two must be drawn. Over-focus on one can affect the resources available for the other. Where major (or to use mining language, principal) hazards exist, it is important to ensure there is proactive inspection of the risk controls intended to prevent and mitigate the consequences of those major disasters which have occurred in the past. It is too late once they have occurred. In 2014 it was not clear what the balance was between these two types of mining hazards.

The rationale for the allocation of resources for proactive versus reactive regulatory interventions, and the proportion of the resources devoted to the principal mining hazards, is now much clearer. Furthermore, what is to be considered when carrying out regulatory interventions on the principal mining hazards is now clearly documented. Making this consideration transparent is an important characteristic of modern high hazard regulators and allows the public, the regulated industry and others affected by the Regulator's decisions to comment and contest the resource allocation decisions.

Governance Arrangements

In 2014 it was normal for one inspector to be responsible for providing the principal point of contact between a mine site and Mine Safety including for incidents reportable by law. There are merits in having a single point of contact. However, it had led, in some quarters, to a perception of regulatory capture as well

as inconsistent decision taking. Unfortunately, a perception of regulatory capture, even if untrue, was damaging to the role of the Regulator whose independence is crucial to it retaining its social licence to regulate. This single point of contact arrangement also led to inconsistency in the regulator's response to reportable incidents. On some occasions individual inspectors in practice became "gatekeepers" of information in respect of reported incidents – even if this was not the stated position of the Regulator at the time. Reportable incidents are now centrally recorded and assessed as part of the formal governance arrangements and allocated as required to the appropriate part of the Regulator for further action as appropriate. This has the merit of removing individual front line decision taking, which promotes consistency and permits broader organisational priorities to be considered.

A similar theme pervades the organisation of formal regulatory interventions. These now typically take place in a team environment (typically two inspectors for a Planned Inspection) and potentially a larger team for TAPS. Furthermore, what is examined in these regulatory inspections is subject to a formal plan based on the hazards and risks of the site and knowledge of the company and less dependent on the individual inspector allocated to the company. Noetic is aware that this may reduce somewhat local knowledge of a particular mine site but was essential in our view to altering some perceptions of regulatory capture.

A Focus on Risk Controls

The 2014 Fatality Review questioned whether "…sufficient focus is applied [by the Regulator] to the implementation of risk controls as part of the risk management process compared to the risk assessment process[27]." The significance of this focus on "control" measures is that the prevailing model of incident prevention and workplace health and safety legislation, requires risks to be assessed and controls implemented to eliminate or minimise the risk. This concept is at the heart of the current and previous legislation. However, it was apparent that the focus on risk controls could be significantly improved. This has happened, although it should be acknowledged there is still more to be done in this area.

Data

The 2014 Fatality Review commented on a variety of weaknesses in the data available to the Regulator and the mining industry in general to support a data led approach to regulation. In 2016 we commented on the work underway, "ACES" to improve the access to good quality data. At this Review we revisited this topic and found that "the use of ACES as a tool in planning and recording has supported more accountable and data-led regulation in Mine Safety." Further improvement to the data system are in train. Compared with 2014 the improvements are manifest.

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[27] See Annex C1 of the MSAC Fatality Review

ANNEX B: SKILLS AND KNOWLEDGE REQUIRED OF THE REGULATOR

As part of our review, we were specifically asked to address the question: what skills, knowledge and experience is required of senior executives at the Resources Regulator? Noetic has considered this in the context of other similar high hazard regulators in Australia and elsewhere in the world. However, we have done this without considering any particular regulatory requirements that may currently exist in relation to the NSW mining industry.

The MSAC Fatality Review published in 2014 identified the need for the Regulator to explicitly consider the contribution of human and organisational factors (HOFs) to mine safety. The rationale for this is that the most incidents have multiple contributory causes. These typically include: issues to do with technology and engineering; how work is organised or managed; and how people interact with each other, the technology and working systems. Consequently, there is no one discipline which has a monopoly on all of these issues and mine safety regulation requires a range of capabilities and disciplines, including but not limited to engineering or mine management.

As is reported in this review, HOFs are now explicitly taken into account in the work of the Regulator and, in addition, there is greater diversity in the Regulator in terms of knowledge, skills and backgrounds of its staff. This move recognises that a capable mining Regulator requires a strong engineering capability, however this is not sufficient on its own. We understand from our work in the mining industry that mining companies have come to a similar conclusion and have a variety of skills and backgrounds represented at senior levels. Senior management positions are not restricted to individuals with statutory qualifications in mine management or mining engineering, which traditionally provided the background for operational management roles. Experience in these fields is required in the management structure at sites but is not a prerequisite for any individual to effectively manage a site.

A similar trend is evident in regulation. Well regarded regulatory organisations have had successful leaders at various times (sometimes carrying the title Chief Inspector) from a wide variety of disciplines and backgrounds. Examples include a chemical engineer as a chief inspector of railways, a PhD scientist as head of an offshore petroleum regulator, and a physicist and former Royal Navy officer as the inaugural CEO of the Australian National Offshore Petroleum Safety Authority, now NOPSEMA. What these individuals all had in common were senior leadership abilities, experience in regulation and the capability to be credible leaders of regulatory bodies in technically complex industries. We note that the regulator now has a number of senior leadership positions which draw upon variety of technical and regulatory experience, which, when operating as a whole, provide for a better positioned and more robust regulatory approach.

We believe that a strong driver of this in both industry and regulators was the need to widen the potential pool of senior staff. In the NSW Resources Regulator, we understand that inspectors, and hence the Chief Inspector, are required to have statutory qualifications in mine management or engineering. It is not clear to Noetic that these qualifications are required individually in the Chief Inspector role or any of the Regulator's senior executive positions. However, we do strongly recommend that there are senior managers with such qualifications. This is necessary within an inspectorate so that high quality decisions can be made on issues that require knowledge of engineering topics to fully understand. It is also essential so that stakeholders including mine managers who hold statutory qualifications and other members of the

workforce have confidence that the inspectorate can bring to bear all the appropriate skills, qualifications and knowledge required to be an effective regulator.
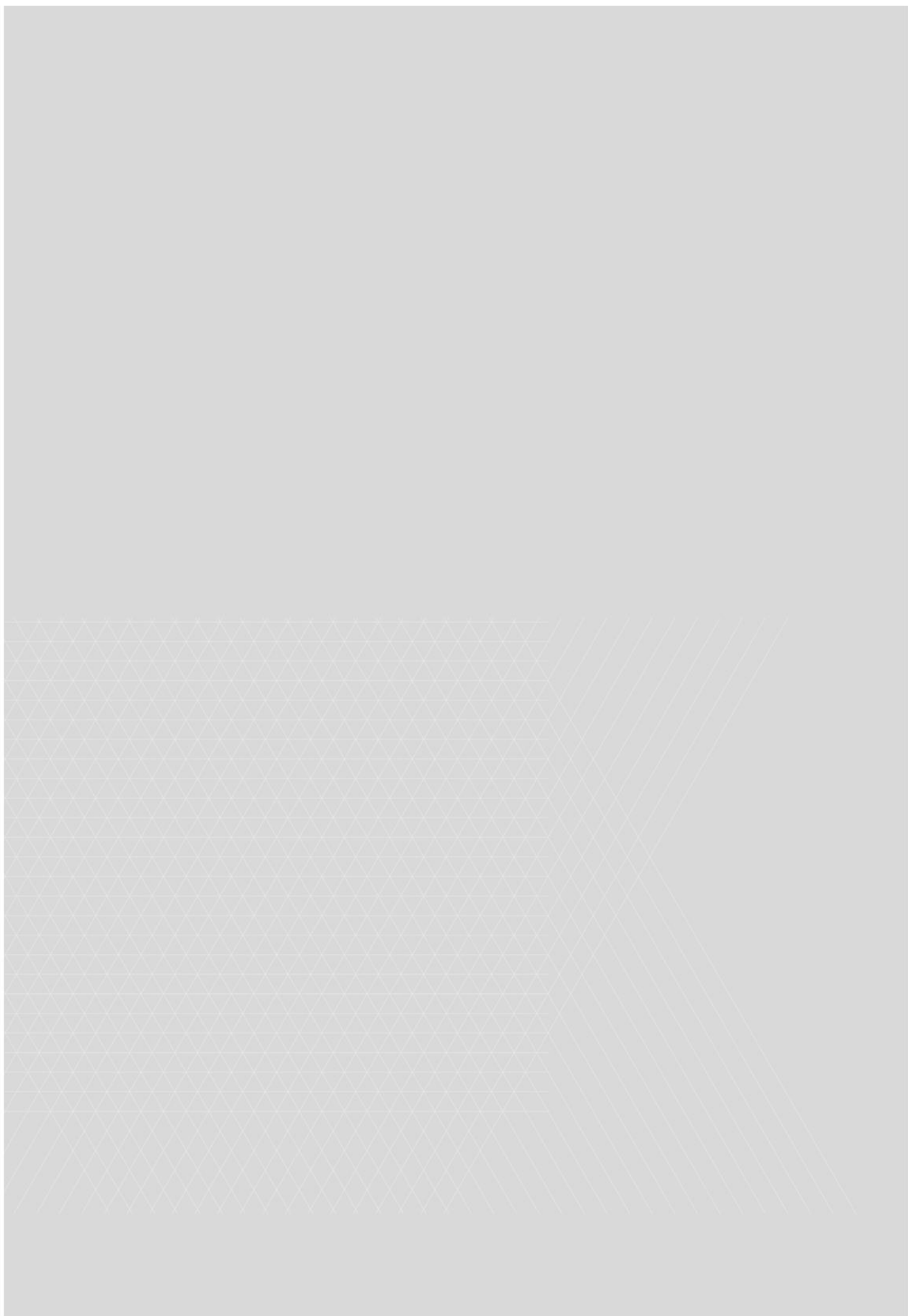
ANNEX C: DOCUMENT LIST

- ACES 2.0 Business Systems Project, Detailed Design: Risk Assessment, Apr 2018
- ACES 2.0 Business Systems Project, Detailed Design: Event Notifications, Feb 2018
- ACES 2.0 Business Systems Project, Detailed Design: Risk Assessment, May 2018
- Centralised Incident Notification CMS – CAU Incident Risk Classification Matrix
- Centralised Incident Notification CMS – Incident Triage Flowchart
- Communications and Engagement Strategy, June 2018.
- Compliance assessment decision tool (CADT), PROC16/26.
- Compliance Priorities Brief: Blasting Exclusion Zones, INT17/183801.
- Compliance Priorities Brief: Control of Bench Heights, INT17/226436.
- Compliance Priorities Brief: Fires on mobile plant, INT17/183801.
- Compliance Priorities Brief: Gas Outburst, INT17/219473.
- Compliance Priorities Brief: Hazardous Chemicals Regulation, INT17/211493.
- Compliance Priorities Brief: Incident Reporting, INT17/191462.
- Compliance Priorities Brief: Plant used in the hazardous zone, INT17/219418.
- Compliance priorities outcomes: July-December 2017, PUB18/100
- Compliance priorities: January – June 2018, February 2018, PUB17/919.
- Fact Sheet: August 2016 - Targeted assessment program, PUB16/393
- Factsheet 1: Human factors in mining, PUB17/189.
- Factsheet 2: Human factors in mining, PUB17/192.
- Factsheet 3: Human factors in mining, PUB17/194.
- Fire or explosion TAP assessment – Ulan West underground mine, SAss 2018/00838
- Governance Framework Terms of Reference, INT17/149327/DOI.
- Guide: Notification of incident and injury, PUB18/179
- Industry engagement: Health control plan, August 2017, Version 0.1 (Draft).
- Investigation Report: Report into the serious injury of a mine worker on 1 February 2016 at the Sibelco Salt Ash Sand Plant, November 2017, PUB17/805
- Mine Safety Incident and Event Classification Taxonomy – Risk: Ground and strata (Draft), 29 May 2018.
- Mine Safety Incident and Event Classification Taxonomy – Risk: Operating vehicles/mobile plant (Draft), 21 May 2018.
- Mine Safety Incident Typology – Revised Interim Taxonomy, Jan 2018 (spreadsheet)
- Mine Safety Incident Typology – Revised Taxonomy and mapping to Principal Mining Hazards, Jul 2017 (spreadsheet)
- Mine Safety Monthly Intelligence Report – April 2017
- Mine Safety Monthly Intelligence Report – June 2017
- Mine Safety Regulatory Reform: Incident prevention Strategy, February 2016, PUB16/59.
- Mine Safety Review and Allocation Panel (RAP): Terms of Reference, Version 1.1, June 2018, INT17/215962.

- Mine Safety Risk Profiling 2017: NSW Metex Mines (Draft), 28 April 2017.

- Mine Safety Spotlight Report – Failure of Explosion Protection, July 2017

- Mine Safety Spotlight Report – Misfires, April 2018

- Observations and recommendations: WHS Authorisation activities review project, November 2017, INT17/218989.

- Policy: Public Comment Policy, May 2017, PUB17/6.

- Procedure: CAU Receiving incident notifications by phone, PROC16/31.

- Procedure: CAU Responding to Notified Incidents (Draft), May 2018

- Procedure: Planning and execution of targeted assessments, interventions and site inspections, PROC16/20.

- Procedure: Weekly Incident Summary, PROC17/39

- Quarterly safety report: January to March 2018, 12 June 2018, DOC18/352598

- Request for Quotation Part B: Mine safety incident and event classification taxonomy, INT17/18152

- Targeted Assessment Program: Consolidated report – Emergency management in NSW underground mines, August 2017, PUB17/512

- Targeted Intervention Program: Gas Management, Mandalong Mine, 9 October 2017.

- Targeted Intervention Program: Gas outburst Assessment tool, Tahmoor Mine, 19-20 July 2017.

- Targeted Intervention Program: Gas outburst Assessment tool, Metropolitan Mine, 2-3 August 2017.

- Targeted Intervention Program: Gas outburst Assessment, Appin Colliery, 5-6 July 2017.

- Targeted Intervention Program: Consolidated report – Gas outburst risks in longwall mining, September 2017, PUB17/634

- Targeted Intervention: Underground coal – S27 Duties of officers, Integra Underground Coal Mine, 5 December 2016

- Taxonomy Project: Overview, Progress Update and Future Actions, May 2018.

ANNEX D: INTERVIEW LIST

- Lee Shearer, Deputy Secretary
- Anthony Keon, Chief Compliance Officer
- Garvin Burns, Chief Inspector
- Tony Linnane, Director Regulatory Services
- Melanie Brown, Director Strategy & Engagement
- Steve Orr, Manager Major Investigations
- Tony Forster, Strategic Advisor to the Deputy Secretary
- Mark Smith, Principal Inspector Targeted Assessment
- Leigh Nicholls, Principal Inspector Central Assessment
- Matthew Barnes, Senior Mine Safety Officer
- Tom Richards, Compliance Coordinator
- Edward Basile, Principal Application Developer, Information and Systems
- Stewart Armstrong, Manager Regulatory Systems, Information and Systems
- Catherine Bass-Kendzy, Manager Monitoring & Evaluation
- Kylie-Ann Kay, Manager Intelligence
- Bill Barraclough, Principal Inspector Coal and Petroleum
- Peter Berkholz, Principal Inspector Small Mines
- Gareth Thomas, Principal Inspector Metex
- Gary Parker, Deputy Chief Inspector Mining Engineering
- Ross Stutchbury, Inspector of Coal Mines – Mechanical