

IN THE MATTER OF**The Hazelwood Coal Mine Fire Inquiry****SUBMISSION OF ALCOA OF AUSTRALIA LIMITED**

Date of Document: 20 July 2015

Solicitors Code: 53
DX: 187

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INTRODUCTION

1. Alcoa of Australia Limited (**Alcoa**) owns and operates a brown coal mine and power station at Anglesea, Victoria. The facility was originally developed to supply power to the Point Henry smelter in Geelong, meeting approximately 40% of the smelter's power needs. Since August 2014, following closure of the smelter, the facility has operated as a stand-alone supplier to the National Electricity Market. When Alcoa announced in February 2014 that the Point Henry smelter would close, it also announced that it would seek a buyer for the Anglesea mine and power station. Unfortunately the sale process did not result in a sale and, on 12 May 2015, Alcoa announced it would close the Anglesea operations. Cessation of operations is scheduled to take place on 31 August 2015.
2. This submission is made to the Board of Inquiry (**Board**) in respect of paragraph 11 of the Board's terms of reference (**ToR**):

Sustainable, practical and effective options that could be undertaken by the mine operator to decrease the risk of fire arising from or impacting the Anglesea Mine for the 2015/2016 summer season, noting the impending closure of the mine on 31 August 2015.
3. The jurisdiction of the Board is limited to analysing the options that could be undertaken by Alcoa to decrease the risk of fire in respect of the Anglesea mine for the 2015/2016 summer season, and is therefore forward looking in its application.
4. The adequacy of historical fire management practices of Alcoa at the Anglesea mine are therefore not within the scope of the Board's inquiry, and neither are the longer term fire management practices that will be implemented by Alcoa as part of the rehabilitation of the mine following the 2015/2016 summer season.

5. It is noted that the "catch-all" contained in paragraph 12 of the ToR ("any other matter that is reasonably incidental to those set out in paragraphs 6 to 10") does not apply to paragraph 11 of the ToR.
6. This submission is therefore divided into two parts.
 - (a) Part A (Background) – this section provides background information about Alcoa; the mine; the regulatory environment within which Alcoa operates the mine; current Anglesea Heath management arrangements; previous mine fires and management responses; Alcoa's current practices to manage fire risk; and the activities at the mine prior to cessation of operations on 31 August 2015. This information is only relevant to the Board to the extent this background information provides a context to understand Alcoa's submission in respect of paragraph 11 of the ToR which is set out in Part B.
 - (b) Part B (Alcoa's submissions in respect of ToR 11) – this section directly responds to paragraph 11 of the ToR and therefore contains Alcoa's submissions in respect of the sustainable, practical and effective actions Alcoa considers will decrease the risk of fire arising from or impacting the mine for the 2015/2016 summer season.

PART A - BACKGROUND

ABOUT ALCOA

7. Alcoa is owned 60 per cent by Alcoa Inc, and 40 per cent by Alumina Limited.
8. Alcoa Inc is listed on the New York Stock Exchange with a market capitalisation of approximately US\$17bn. A global leader in lightweight metals technology, engineering and manufacturing, Alcoa Inc employs approximately 59,000 people in 30 countries to deliver value-add products made of titanium, nickel and aluminium, and produce best-in-class bauxite, alumina and primary aluminium products.
9. Alumina Limited is an Australian company listed on the ASX and the OTC market in the U.S. with a market capitalisation of approximately A\$3.9bn.
10. In Australia, Alcoa operates an integrated bauxite mining, alumina refining and aluminium smelting system.

THE MINE

Land

11. The "Anglesea Mine" is defined in the ToR as "the land the subject of the Mines Aluminium Agreement (Agreement 6829) as in force from time to time, which was ratified by the *Mines (Aluminium Agreement) Act 1961*".
12. The coal mine operates pursuant to a State Agreement (the Mines Aluminium Agreement) that Alcoa entered into with the Victorian Government. Some further information about the State Agreement and the *Mines (Aluminium Agreement) Act 1961* (Vic) (**MAAA**) is set out at para 25-29, below.
13. The Anglesea site comprises freehold land (approximately 143 ha) and leased Crown Land (7,289 ha). It is located to the north of the town of Anglesea, approximately 40 km southwest of Geelong and 120 km southwest of Melbourne.
14. The Anglesea power station is located adjacent to the coal mine and both operations are located within the overall site boundaries.

Mining operations

15. Since February 1969, Alcoa has mined approximately 1.1 million tonnes per annum of brown coal from the main upper seam within the open cut located in the south-east of the leased area. A truck and excavator methodology has been used.
16. The current mining footprint lies approximately in the centre of a proven coal field that contains reserves to last another 57 years at previous rates of extraction.
17. Back filling and rehabilitation have taken place in areas that have been mined.

Comparison to Latrobe Valley coal resources

18. The Anglesea coal is of a higher grade than the tertiary brown coal used elsewhere in Victoria for electricity generation, and is classified as a soft brown coal approaching the hard brown coal stage due to its age.

19. The Anglesea brown coal deposits provide a reliable source of fuel and exhibit some characteristics that are favourable compared to brown coal located in the Latrobe Valley.
20. The coal is approximately 40 million years old, making it older than the Latrobe Valley coal, with a greater heating value. The coal has comparatively less moisture (at approximately 45%), is harder and less porous, and contains slightly less volatile organic compounds than the Latrobe Valley coals.
21. The absence of fire events at the small emergency stockpile at the Anglesea power station, in place for more than 18 years, is a good demonstration of the relatively low risk of Anglesea coal spontaneously combusting. Alcoa understands that due to spontaneous combustion risks, similar stockpiling of Latrobe Valley coals does not occur.
22. This lower potential for spontaneous combustion of the coal contained in the Anglesea mine is important to understand when considering Alcoa's submissions in Part B.
23. Over its life, the Anglesea mine has had an average seam thickness of 27 metres, with overburden depths reaching as high as 80 metres. Alcoa understands that in Latrobe Valley deposits the situation is reversed, with thicker coal seams up to 100 metres and typically shallower depths of overburden around 20 metres. The overburden to coal ratio at the Anglesea mine is therefore greater than for the mines located in the Latrobe Valley, meaning that the mine generates comparatively more overburden.
24. This greater overburden to coal ratio has enabled progressive backfilling and rehabilitation of sections of the mine where coal has been extracted, ensuring relatively less residual coal exposure, the elimination of most of the old coal faces, and the minimisation of external overburden stockpiles.

REGULATORY REGIME

MAAA and State Agreement

25. The mine and power station are operated under a State Agreement between Alcoa and the State of Victoria dated 22 November 1961. The State Agreement has been ratified, validated, approved and given effect to by the MAAA. The State Agreement commenced on 1 February 1962 with an original term of 50 years and was renewed (and amended) in 2012 for a further 50 years. The State Agreement is now scheduled to expire on 31 January 2062.
26. The State Agreement is treated as a mining licence under the *Mineral Resources (Sustainable Development) Act 1990* (Vic) (**MRSD Act**), of which Alcoa is the registered proprietor.

Work Plan

27. Alcoa holds an approved work plan for the purposes of the MRSD Act, which authorises it to carry out mining works within the "stage 1 area" of the "specified area", as those terms are defined in the State Agreement. The "stage 1 area" covers the area of Alcoa's historic mining operations together with the areas described as "stage 1" and "stage 2" in the work plan. The "specified area" includes the "stage 1 area" but also includes the areas described as "stage 3" through to "stage 6" in the work plan.
28. Alcoa is deemed to have a work authority in respect of its endorsed work plan.
29. Alcoa must carry out work in accordance with the endorsed work plan and any subsequent endorsed work plan variations (condition 1.1 of the work plan conditions).

Rehabilitation

30. The work plan conditions require that the final rehabilitation of the mine is in accordance with the endorsed work plan (condition 25.2).
31. The priority for Alcoa is to ensure the safe, environmentally sound, and efficient permanent shutdown of the mine and power station on 31 August 2015, with a particular focus on ensuring the safety and wellbeing of Alcoa employees during this very difficult period, the longer term closure, decommissioning and rehabilitation plan will be developed following shutdown. These longer term plans will be consistent with the approved work plan, and be developed in consultation with the appropriate Government Departments and following stakeholder and community engagement.

ANGLESEA HEATH – CURRENT ARRANGEMENTS

32. An agreement between Alcoa and Department of Environment, Land, Water and Planning (**DELWP**) allows the joint management of the non-mining part of the leased area, to ensure that the land area known as the "Anglesea Heath" is protected.
33. The lease contains approximately 7,079 hectares of heath land, managed co-operatively between Alcoa and Parks Victoria (**PV**) under a formalised agreement initiated in 2000. The agreement aims to protect the biodiversity, landscape, water catchments, and cultural heritage of the land for conservation, while providing opportunities for public appreciation and sustainable enjoyment of the area. Management of the Anglesea Heath occurs through the implementation of strategies and actions in the Management Plan including the protection of threatened species, track rationalisation and rehabilitation.
34. In general terms, Alcoa matches the contributions of the DELWP in relation to the costs of the co-management of the Anglesea Heath, which are agreed between the parties on an annual basis. Alcoa's contributions over the last 10 years total A\$739,000.
35. Approximately 124 hectares of Alcoa owned freehold land forms part of the Anglesea Heath. This land was initially acquired by Alcoa to provide a buffer between the town and the Anglesea operations. The land consists of mostly natural heath land, plus land leased to Council for use as the Anglesea Bike Park.
36. DELWP and PV are the authorities primarily responsible for fire risk management in the Anglesea Heath. Alcoa has no fire risk management role in the Anglesea Heath. This is not expected to change.
37. DELWP and PV's fire management role includes reducing the risk of fire through strategic fire breaks, fuel reduction burns and responding to bushfire.
38. Alcoa has a stakeholder role, providing feedback and input into DELWP's fire management and prevention strategy, predominantly from an ecological perspective, and providing consent and access for DELWP for fire prevention activities and water supply within the Anglesea Heath.

PREVIOUS MINE FIRES AND MANAGEMENT RESPONSES

39. During the life of the mine, it is the understanding of current Alcoa mine management, that there have been three types of fire events at the mine:
 - (a) mobile equipment fires;
 - (b) coal fires associated with spontaneous combustion; and

- (c) coal fires started by ember attack due to the Ash Wednesday bushfires in 1983 (the only occasion in the history of the mine, to the knowledge of current mine management, where an ember attack has led to fire on the exposed coal surface).
40. A description of these historic events, and Alcoa's management responses to these fires, is contained in paragraphs 23-45 of Christopher John Rolland's witness statement dated 22 June 2015. Alcoa notes that this witness statement refers to a 1999 flame event. As a result of reviewing historical aerial photographs, Alcoa is now of the belief that this flame event was likely to have occurred in 1997 rather than 1999. However, despite conducting an extensive search, Alcoa has been unable to locate any relevant documentation relating to this event.
41. In relation to spontaneous combustion, it is important to note that this is a naturally occurring event the risk of which needs to be carefully managed.
42. Alcoa considers spontaneous coal combustion to have three progressive stages:
- (a) steamy coal;
 - (b) blue smoke/odour coal; and
 - (c) open/visible flame coal.
43. Heat haze visible from steamy coal and any associated odour are conditions that indicate the early presence (and detection) of a developing risk of spontaneous combustion.
44. Alcoa has procedures in place (contained in the "Mine Coal Fires and Hot Coal Procedure Standard Work Instruction" (**SWI**)) to prevent blue smoke events from occurring. Visible heat haze from steamy coal and associated odour are used as triggers to quickly mobilise an Alcoa team and prevent the coal heating up to an extent that it leads to a blue smoke/odour or open/visible flame coal event. Usually this involves excavating or otherwise removing the impacted material and dousing it with water.
45. Fire prevention is an important consideration in Alcoa's operations, and Alcoa is proud that in 46 years of mining at Anglesea it has not had any significant fire events. In fact, to the best knowledge of Alcoa's current mine management, there have only been three occasions where the coal has heated through spontaneous combustion to an extent where open/visible flames were observed. These "Flame Events" are detailed in Christopher John Rolland's witness statement (noting again that Alcoa now considers that the date of the first flame event is likely to be in 1997 rather than 1999), and were all extinguished within hours using Alcoa resources and conventional earthmoving equipment.
46. In relation to the out-of-control DELWP back-burn in the Anglesea Heath in 2009, Alcoa provided a water cart inside the mine boundary to protect its crushers and coal stockpiles. Alcoa also helped DELWP to put out the peat swamp fire that arose from the burn by providing approximately 50% of the hoses and supplying pumps and water from ash pond number 2 to extinguish the fire.

CURRENT MANAGEMENT OF FIRE RISK

47. Alcoa currently has policies, procedures and practices in place to:
- (a) decrease the risk of fire arising from the mine;
 - (b) decrease the risk of fire impacting on the mine from an external source such as a bushfire;
 - (c) mitigate the effect of a fire arising from the mine; and

- (d) mitigate the effect of fire impacting the mine from an external source such as a bushfire.
48. These policies, procedures and practices are detailed in paragraphs 46-59 of Christopher John Rolland's witness statement dated 22 June 2015.
49. For example, Alcoa has an "Alcoa Power Station Anglesea Emergency Management Plan" (**Emergency Plan**) which is a site wide plan that includes bushfire and coal mine fire procedures. The Emergency Plan, amongst other things, has separate sections dealing with "coal fire" and "bushfire". These sections describe fire behaviour and fire hazards. Furthermore the plan outlines procedures that are undertaken by Alcoa in order to prevent the risk of fire. The Emergency Plan is prepared in accordance with regulation 5.3.34 of the *Occupational Health and Safety Regulations* (2007) Vic. Alcoa also has a trained and experienced emergency response team.
50. In response to the Hazelwood mine fire and ensuing 2014 inquiry, Alcoa proactively undertook an internal risk assessment in December 2014 prior to a risk assessment process being developed and directed by authorities. Further information about this risk assessment is contained in paragraphs 50-52 of Christopher John Rolland's witness statement dated 22 June 2015. The 2014 risk assessment did not identify any high risks for a mine fire. A number of medium risks were identified, including steamy coal (where risks were driven by frequency, with the actual impact of any steamy coal event being negligible). Fire and emergency management plans were also found to be in place. However, a number of follow up actions and improvements were noted as listed in the risk treatment plans. Key to this was ensuring the SWI was robust, well communicated, and effective in its implementation.
51. These actions and improvements were implemented appropriately.

CURRENT LIKELIHOOD OF MINE FIRES

52. Alcoa is of the opinion that the current likelihood of fires starting within the mine, and the mine being impacted from an external fire source such as a bushfire, is low. This is as a result of:
- (a) the inherent properties of the coal itself which reduces the risk of spontaneous combustion;
- (b) the very small number of historic fire events at the mine over its nearly 50 year history;
- (c) Alcoa's progressive backfilling and rehabilitation practice which is aided by the higher overburden to coal ratio at the mine;
- (d) Alcoa's current policies, procedures and practices to manage and mitigate fire risks (refer to further detail in paragraphs 46-59 of Christopher John Rolland's witness statement dated 22 June 2015); and
- (e) the commencement of the overburden placement project (refer to further information in Part B of this submission).
53. This conclusion is supported by the risk assessment and technical review, the details of which are included in Part B of this submission.

WHAT IS HAPPENING AT THE MINE PRE CLOSURE?

54. Alcoa has commenced developing a safe, environmentally sound and efficient shutdown plan (**Shutdown Plan**) for its Anglesea operations. The Shutdown Plan will guide the decisions

necessary to achieve the safe and efficient shutdown of the mine and power station on 31 August 2015, and contains the following key milestones.

Key Activity	Target Date
Closure Announcement	May 12, 2015
Commence people counselling, career transition, training , etc	May 12
Commence covering remaining open coal areas with overburden	May 28
Complete people counselling, career transition, training, etc	July 31
Complete station emergency coal stockpile removal	July 31
Establish onsite 24/7 ongoing security	August 17
Complete covering coal with overburden (excluding the western wall area, refer to para 80, below)	August 20 ¹
Cease coal mining and delivery activities	August 23
Cease generation	August 25 @ 1100
Shutdown and isolate 220kV transmission line	August 26
Complete SO ² station decommissioning and recovery	August 28
Complete shutdown of auxiliary plant no longer required	August 28
Complete making station safe for handover	August 31
Handover to the Alcoa Asset Planning & Management group	September 1

¹ This is an internal target date for completion, which provides a buffer to the hard stop date of 31 August 2015 for completion of the overburden covering project.

PART B – ALCOA'S SUBMISSION IN RESPECT OF TOR 11

55. As set out in the Introduction, Part B of this submission responds directly to paragraph 11 of the ToR, and therefore contains Alcoa's submissions in respect of the sustainable, practical and effective options it considers could be undertaken to decrease the risk of fire arising from or impacting the mine for the 2015/2016 summer season.
56. The Board is referred to Warren Steven Sharp's witness statement dated 22 June 2015, which provides preliminary evidence in relation to these actions. The Board is also referred to Mr Sharp's supplementary witness statement, submitted to the Board on 14 July 2015.

EFFECT OF CLOSURE ON FIRE RISK FOR 2015/2016 SUMMER SEASON

57. It is Alcoa's view that cessation of coal mining and associated operations at the mine and power station will further reduce the already low (see para 52, above) risk of fire associated with the Anglesea site. This view is based on the following:
- (a) the cessation of coal mining and associated activities;
 - (b) the covering of exposed horizontal surface coal with approximately one metre of overburden (see para 69-72, below);
 - (c) an immediate reduction in "hot work" activities that are a normal (carefully managed) part of any mining operation;
 - (d) Alcoa retaining control over the site and ensuring that both resources and response procedures are in place as appropriate (see para 119-135, below);
 - (e) Alcoa working with various authorities, including Country Fire Authority (**CFA**), Emergency Management Victoria (**EMV**), Worksafe Victoria (**WV**) and PV with respect to managing any short term impacts associated with the cessation of operations on 31 August 2015 (see para 99-118, below); and
 - (f) A risk assessment completed by Alcoa on 10 July 2015 did not identify any significant risks relating to fire at the site. In addition, a variety of actions identified in the Risk Assessment will be implemented by Alcoa prior to 31 August 2015 to ensure fire risks are managed in an appropriate fashion (see para 93-98, below).
58. It is expected that the measures described above will remain in place to ensure ongoing fire risk prevention, detection and mitigation until the final closure and rehabilitation plan is agreed with relevant stakeholders (which is expected to be consistent with the currently approved work plan), and associated long term rehabilitation activities commence.

DECREASING FIRE RISK BY HAVING CLEAR LINES OF ACCOUNTABILITY

59. Alcoa has a well-established and experienced team that will manage the Anglesea site, including Alcoa's freehold land, during the 2015/2016 summer season; and will have in place the necessary resources to provide extensive site and fire management knowledge.
60. After operations cease on 31 August 2015, the Anglesea site will be managed by Alcoa's Eastern Australian Asset Planning and Management group (**APM**) based at Alcoa's Point Henry site. APM will provide services to Alcoa relating to decommissioning and rehabilitation of the mine and power station.

61. The current manager of the Anglesea operations, Warren Sharp, is a member of APM, having been appointed the Point Henry site asset manager in September 2014, and will also become the Anglesea site asset manager on 1 September 2015.
62. APM is part of Alcoa Inc's global International Project and Asset Management group (**IPAM**). Formed in 2003, IPAM is dedicated to supporting Alcoa Inc business units in the repositioning of locations and assets, providing further resources, guidance, experience and expertise in the areas of:
 - (a) facility decommissioning;
 - (b) project management;
 - (c) environmental remediation;
 - (d) brownfields redevelopment;
 - (e) real estate development and land master planning;
 - (f) finance and accounting; and
 - (g) stakeholder engagement.
63. Alcoa Inc globally has significant mining and mine rehabilitation experience, including in relation to coal mines. Alcoa is able to access that expertise via Alcoa Mining and its Global Mining Centre of Excellence based in Western Australia.
64. Alcoa notes that its occupational health and safety reporting system will not change in terms of accountability following the cessation of operations of its freehold land at Anglesea for the foreseeable future.

DECREASING FIRE RISK THROUGH EFFECTIVE SITE SECURITY MEASURES

65. Alcoa will maintain an onsite presence through a 24 hour, 7 days a week contracted security service for monitoring the mine and power station, and will ensure appropriately trained (including with respect to fire identification, firefighting and appropriate emergency responses) personnel will be present on site at all times. This contracted security presence will be at the power station and mine through the 2015/2016 summer season.
66. These resources are expected to be mobilised to site prior to 31 August 2015 to allow for adequate site familiarisation and training.
67. Communication between the site security resources and the local CFA will be established, inclusive of having the new site security group participate in the local CFA site re-familiarisation visit to be scheduled approximately mid-August 2015.
68. This site security presence will be supported by adequate and appropriate Alcoa resources.

DECREASING FIRE RISK THROUGH THE OVERBURDEN STRATEGY

69. Recognising the potential future risk of fire, albeit low, Alcoa decided, based on past experiences and the judgment of its staff, and in light of what was practical to achieve by 31 August 2015, to ensure that all exposed coal within the mine, with the exception of the western wall, would be covered by approximately one metre of overburden by 31 August 2015 (**Overburden Strategy**).

70. The decision to implement the Overburden Strategy was made in order to significantly reduce any risk of fire arising from, or impacting on, the mine in the 2015/2016 summer season and into the future by limiting oxygen supply to the buried coal (thereby reducing the risk of self combustion), and minimising the chance of a fire being ignited by external ember attack.
71. Implementation of the Overburden Strategy, which is a key element of the operational Shutdown Plan, commenced on 28 May 2015.

Implementation plan

72. The implementation plan developed by Alcoa for the Overburden Strategy consists of the following steps:
- (a) assessing the total exposed coal area to be covered by 31 August 2015 to a depth of approximately one metre;
 - (b) developing a target for the volume of overburden required;
 - (c) setting daily overburden coverage targets;
 - (d) sourcing the volume of overburden required from onsite resources such as the overburden stockpiles and from pushed down material from selected surrounding batter regions;
 - (e) utilising Alcoa's existing mining operations team and mining fleet to cover the exposed coal (supplemented by external resources if required);
 - (f) implementing a daily management process to review progress against targets; and
 - (g) completion of the Technical Review (see para 73-82, below);
 - (h) completion of a review by Alcoa's Mining Centre of Expertise (see para 83-87, below).

Technical Review

73. Mining One Consultants was engaged by Alcoa on 15 June 2015 to conduct an independent technical review of the Overburden Strategy (**Technical Review**). The scope of the Technical Review may be summarised as follows:
- (a) Review the current Overburden Strategy documentation, including validation of the area of coal to be covered, the total volume of overburden material to be moved, and the daily/weekly/monthly rates of overburden movement necessary to achieve the targeted completion date of 20 August 2015;
 - (b) Identifying any potential risks that may impact on the achievement of overburden movement targets;
 - (c) Evaluation of the one metre coverage strategy, and its adequacy to prevent any form of spontaneous combustion from the buried coal; and
 - (d) Provision of an opinion/advice regarding possible alternative methods for covering currently exposed western mine batters.

74. Principal Mining Engineer, Cameron Farrington, of Mining One Consultants undertook the Technical Review.
75. Mining One conducted a one day site visit on 23 June 2015 to inspect the current status of the mine and to inspect the material that is being used for covering the coal to ensure its suitability. The site visit was primarily focused on critiquing the initial phase of the mine shutdown strategy and to make recommendations on ensuring that the initial shutdown would secure the coal until the final closure and rehabilitation phase. During the site visit, Mining One inspected the coal faces, the status of the coal cover with the Overburden Strategy, and assessed the nature of the material being used for covering.
76. Extracted below is the executive summary of the Technical Review:

Mining One has conducted a site visit for the purpose of assessing an interim mine shutdown strategy to ensure the in-pit coal asset (including any remnant coal and other coal-associated combustible components) is adequately secured as to provide a suitable level of risk mitigation for adverse heating and potential ignition of the coal this includes reducing the potential of spontaneous combustion or ash attack. The interim mine shutdown period will be maintained until final landform work commences at Anglesea including rehabilitation and revegetation of the site.

Mining One endorse the current strategy of capping all horizontally (flat lying) oriented coal asset exposure with 1.0m of material with a clay content greater than 10%. A clay content of less than 10% can be tolerated where remnant coal is being encapsulated.

For vertically exposed coal (coal in the pit faces) Mining One have recommended two alternative strategies:

- 1. Full encapsulation of the coal with a 5.0m buffer as to prevent ash attack and coal oxidation.*
- 2. A managed program involving daily pit inspections and suitably managed action plans. This option will deliver a fire risk in line with the current risks associated with the vertically exposed coal, which historically has been low.*

Mining One is comfortable that there is adequate supply of suitable material within the site waste dumps to achieve the encapsulation of the coal within these guidelines. As this represents the first phase of the mine closure Mining One recommends that these strategies be monitored during the interim period to ensure adequate coverage is achieved. These recommendations have been made understanding that equipment and manpower constraints dictate that priority be given to the flat-lying coal assets so that these are covered prior to the mine shutdown on the 31st August 2015.

77. The Technical Review also found that the horizontal area of exposed coal to be covered is approximately 41.3 hectares, compared to the 32 hectares originally estimated by Alcoa.
78. The overburden material being used to cover the coal was inspected by Mining One with the following comment subsequently provided at page 9 of the Technical Review:

An inspection of the waste material being sourced for capping was undertaken with the main observations being that all material being sourced for capping has minimal rock in it and is therefore considered ideal for capping as it predominantly consists of clays and sands. As the material is being sourced from an old waste dump the material was well blended and had a good distribution of clays through

it. With the exception of the white coarse sand most of the material appeared to contain adequate clay to provide a competent cap. It should be noted that inspection of this material indicated clay levels approximating 20%, this is considered ideal for encapsulation of the coal.

79. Alcoa is satisfied that the Technical Review supports its view that the Overburden Strategy will further reduce an already low risk of fire in the mine.
80. A section of the western mine batters (approximately 850 metres long by 5 to 10 metre's high²) cannot be covered with overburden by 31 August 2015 as originally intended, due to its proximity to the approved Cultural Heritage Management Plan boundary (which prevents earth being pushed down from above), the short timeframe, and the significant work required to cover the horizontal coal surfaces. It should be noted that sections of this wall have been exposed for up to 28 years without any spontaneous combustion events. Alcoa is confident that strategy 2 (above) recommended by Mining One will continue to result in a low fire risk for the exposed west wall during the 2015/2016 summer season. Alcoa intends that this section of the western mine batters will be covered with overburden by 2017/2018, as part of the longer term mine rehabilitation process.
81. A copy of the Technical Review has been provided to the CFA, WV, EMV and DEDJTR.
82. A copy of the Technical Review was included as Annexure B to Warren Sharp's supplementary statement dated 14 July 2015.

Internal review by Alcoa Mining's Centre of Expertise

83. Alcoa Mining's Centre of Expertise consists of a number of Alcoa personnel who are highly experienced in the management and operation of mining activities, including coal mines, around the world. This specifically includes recent experience in rehabilitation of an open cut coal mine in Rockdale Texas USA, which included management of spontaneous combustion risks.
84. A review of the Overburden Strategy by Alcoa Mining commenced on 16 June 2015 and was completed on 10 July 2015. The review included consideration of the Technical Review conducted by Mining One.
85. Key elements of the feedback received from Alcoa Mining in respect of the Overburden Strategy included:

"We agree with Mining One's proposed interim strategy for fire management at the site, given its scale, key characteristics, historical performance and the combination of risk management measures to be implemented..."

In terms of coal fire risk from self-combustion, the company's experience is that the risk may vary significantly between sites and be heavily influenced by chemical characteristics of the coal resource as well as other locality specific factors. Management measures applied at any site should be developed specifically for the particular location in question..."

While it would be desirable to also cover this section [the section of the west wall identified in section C of this statement] with 1m of overburden, Alcoa Mining

² In some documentation, the western batters are noted as being 15 metres high, however expected overburden earthworks will cover the lower section of the batters and therefore reduce the height of the uncovered wall to 10 metres where possible.

agrees the risk of self combustion in this area is low and can be adequately managed through surveillance and on-site fire response infrastructure...

Alcoa Mining considers the proposed approach is appropriate as an interim measure in preparation for the upcoming summer period."

86. A copy of the Alcoa Mining feedback was included as Annexure A to Warren Sharp's supplementary statement dated 14 July 2015.
87. The expertise within Alcoa Mining, including the Mining Centre of Expertise, will remain available to APM post the operational shutdown and will be engaged appropriately.

Implementation status

88. The Technical Review found that the horizontal area of exposed coal to be covered is approximately 41.3 hectares, compared to the 32 hectares originally estimated by Alcoa. As a result, the internal Alcoa daily and overall targets for overburden movement have been reset. It is still expected that the 41.3 hectares will be covered by the target date of 31 August 2015, although external contracted earth moving support is currently being sourced by Alcoa to ensure that this is the case.
89. Alcoa considers that the main risk to achieving this by 31 August 2015 is if there are extended periods of rain over the winter months. If the timetable for implementation is not being achieved, Alcoa intends to mobilise extra resources during periods of fine weather to make-up for lost wet weather days.
90. As at 20 July 2015, approximately 19 hectares of the estimated 41.3 hectares of exposed coal has been covered by approximately one metre of overburden.
91. Prior to 1 July 2015, the depth of the approximate one metre of overburden cover was being estimated by the Alcoa supervisor and mine operators. Following its site visit on 23 June 2015 Mining One reported "material being placed at a thickness approximating 1.0m". Since 1 July 2015, pegs have been placed into the area being covered and painted at a height of one metre to ensure that the depth of the overburden being placed on the exposed coal remains consistently at approximately one metre or above.
92. Compaction of the overburden is being achieved with the dump trucks tracking over the placed overburden.

Risk assessment

93. As part of the preparation of the Shutdown Plan, Alcoa commenced an internal risk assessment process on 12 June 2015 to further understand and assess potential risks associated with fires arising from or impacting on the mine following closure on 31 August 2015 (**Risk Assessment**). The Risk Assessment was undertaken in accordance with an Alcoa corporate standard (Risk Management Procedure) which is consistent with AS/NZS 4360:2004 Risk Management, and was completed on 10 July 2015.
94. The intent of the Risk Assessment included:
 - (a) identifying potential causes of fire arising from or impacting on the mine, and quantifying the risk associated with each potential cause, and identifying any actions and/or countermeasures which could be implemented to appropriately manage those risks;
 - (b) identifying key elements/event types that could initiate a mine fire; and

- (c) using the defined process in the Alcoa corporate standard, assessing each element for specific causes, existing controls, consequences against the likelihood of potential risk, and determining potential future and additional controls to control identified risks.
95. Following is a summary of the outcomes of the Risk Assessment:
- (a) History: To the knowledge of current mine management, in over 46 years of operation, Anglesea has only had three open flame coal fire events, each has impacted a very small area of coal, and been extinguished within hours of being detected using Alcoa resources. Sections of the west wall have been open for up to 28 years without any spontaneous combustion events. Ash Wednesday (1983) resulted in several small spot fires on the horizontal coal surface that were quickly extinguished following the passing of the fire front.
 - (b) Six potential sources of risk of coal fire ignition (elements) were identified in the Risk Assessment process.
 - (c) The Risk Assessment for each element did not identify any high risks.
 - (d) One medium risk was identified, which related to Image and Reputation risk (reflective of the team/community heightened sensitivity to this issue following the recent Hazelwood Mine fire).
 - (e) All other risks were rated low including for Environment Health and Safety related issues.
 - (f) The Risk Assessment did highlight the need for robust controls to be developed and put in place prior to 31 August 2015. This included review and updating of various procedures/SWIs, close consultation with various stakeholders (ie CFA), ongoing provision of resources to mitigate an event should it occur, and ongoing daily inspection regimes to detect any potential issues or events as early as possible. Key follow up actions and improvements were noted as listed in the risk treatment plans.
 - (g) Shutdown planning should include a review and implementation of each of the identified actions.
96. The Risk Assessment for the area of the western mine batters that will remain exposed did not identify any significant risks with a mitigation strategy that includes:
- (a) on-site security (see para 65-68, above);
 - (b) adequate and appropriate Alcoa resources (see para 59-68, above);
 - (c) retention of Alcoa equipment necessary for fire fighting (see para 130-135, below); and
 - (d) review and updating of key plans and procedures including the Emergency Response Plan, SWI, and the CFA Pre-Incident Plan (see para 119-129, below).
97. Each of the corrective actions identified in the Risk Assessment have been assigned to a responsible Alcoa employee with a target completion date of 31 August 2015. The Anglesea management team will review the progress of each action item weekly.

98. Alcoa is currently seeking to engage an independent fire risk assessor to assess the internal Risk Assessment outcomes and the process.

DECREASING FIRE RISK THROUGH COOPERATION AND CONSULTATION WITH RELEVANT AGENCIES

Surf Coast Mine Task Force

99. On 28 May 2015, a number of Alcoa representatives attended a Surf Coast Mine Task Force meeting facilitated by EMV which included the CFA, WV, Environment Protection Authority Victoria (**EPA**), DEDJTR, Department of Premier and Cabinet and the Surf Coast Shire Council (**Shire**). At this meeting, Alcoa's initial intention to cover all exposed coal at the mine with approximately one metre of overburden by 31 August 2015 as part of the developing Shutdown Plan was communicated.
100. The agencies present at this meeting indicated that they were supportive of Alcoa's strategy to address fire risk, and understood why this was being undertaken.

Department of Premier and Cabinet - Implementation Monitors

101. On 28 May 2015, Alcoa hosted a visit and mine tour for Steve Gleeson and Brian Hine of the Department of Premier and Cabinet in their role as implementation monitors overseeing the recommendations of the Victorian Government's Hazelwood Mine Fire Inquiry. Mr Gleeson and Mr Hine indicated that they were comfortable with Alcoa's strategy, and noted that Alcoa's proposal was ambitious given the amount of soil which would need to be moved by 31 August 2015.

EPA

102. Alcoa met with EPA representatives Tony Robinson, Eve Graham, Carolyn Francis and Andrew Sargeant on 3 July 2015. The discussion included providing an update on the current shutdown planning status and future fire risk mitigation and response strategies. No significant concerns were raised by the EPA at that meeting.

DEDJTR and other Departments

103. Alcoa had a meeting with representatives from DEDJTR on 19 June 2015 with discussions including an update on the current shutdown planning status and future fire risk mitigation and responses strategies. No significant concerns were raised by DEDJTR in relation to fire management. DEDJTR requested a copy of both the Technical Review and the Risk Assessment when available. Both have been provided.
104. Alcoa has provided updates on the current shutdown planning status and future fire risk mitigation and response strategies to mixed department meetings including representatives from DEDJTR, DELWP and EPA on 3 and 8 July 2015. No significant concerns were raised with respect to fire management into the future.

CFA

105. Alcoa will work with the CFA and review the Alcoa Anglesea Pre-Incident Plan (**Pre-Incident Plan**) ensuring it is appropriate for the Anglesea operations post closure. This is a CFA document that ensures an appropriate response can be undertaken for any event requiring CFA support.

106. Alcoa and the CFA met on 8 July 2015 to discuss the current status of Alcoa's shutdown planning in readiness for 31 August 2015, and also to discuss fire response and mitigation strategies post 31 August 2015.
107. Attendees at this meeting included Wayne Aylmer and Geoff McGill of the CFA, and Warren Sharp, Bryce Hutton, Chris Rolland and Lisa Mills of Alcoa.
108. The meeting agenda is set out below:
- (a) *Update on Alcoa Shutdown Planning for 31 August 2015 including mine, power station and water.*
 - (b) *Discuss future response to fire events.*
 - (c) *Identify CFA requirements including:*
 - (i) *Site access;*
 - (ii) *Water;*
 - (iii) *Escort; and*
 - (iv) *Other.*
 - (d) *Discuss 'trigger' points.*
 - (e) *Communication between Alcoa and CFA after 31 August 2015.*
 - (f) *Pre-Incident Plan review requirements.*
 - (g) *Review of Alcoa's Emergency Plan.*
 - (h) *Other.*
109. The overview of Alcoa's shutdown planning included an update on the Overburden Strategy, the station shutdown strategy, expected onsite water sources and availability post 31 August 2015, and expected site access, induction and communication arrangements post 31 August 2015. Discussions were constructive and the CFA did not raise any significant concerns.
110. Below is a summary of the key outcomes agreed at the 8 July 2015 meeting.
- (a) Alcoa complete review of current Emergency Plan.
 - (b) Alcoa and CFA complete a review of the current Pre-Incident Plan.
 - (c) Follow up meeting scheduled for 3 August 2015 including both Alcoa and CFA to jointly review both documents in detail together.
 - (d) Schedule a visit by the local CFA to site for approximately mid August (preferred date to be advised by CFA) for site re-familiarisation, walk through changes to Pre-Incident Plan and arrangements that will be in place post 31 August 2015.
 - (e) It is expected that in the review of the Alcoa Emergency Plan and the Pre-Incident Plan all of the detailed issues, arrangements, and procedures will be highlighted and detailed appropriately.

PV

111. Alcoa has held initial discussions with PV, and has scheduled a follow up meeting on 21 July 2015 to provide an update on the current status of shutdown planning, including with respect to fire preparedness. To date no significant concerns have been raised by PV.

EMV

112. An update on the current status of shutdown planning was provided to EMV on 16 July 2015 including with respect to the Overburden Strategy; no significant concerns were raised. The Technical Assessment and Risk Assessment were provided to EMV following this discussion.
113. A follow up meeting has been scheduled with Craig Lapsley and Peter Schmidt of EMV on 28 July 2015. At this meeting an update will be provided on the current status of the shutdown planning, including discussion on future fire risk mitigation and response strategies.

WV

114. Alcoa met with Chris Walschots, Sean Byrne, and Tony Ferrazza of WV on 29 June 2015 to provide an update on the status of the current shutdown planning, and also to discuss future fire risk mitigation and response strategies. This included an inspection of the coal covering activity underway. WV did not raise any significant concerns with respect to the Overburden Strategy.
115. WV requested a copy of the Technical Review and Risk Assessment when available, and this has been provided.
116. WV provided an entry report indicating that it would attend site for a follow up review on 12 August 2015, and that this would include review of numerous items including "Fires and Emergency Planning" and "Controls relating to fire". During this visit it is anticipated that both the updated Emergency Plan and Pre-Incident Plan will be provided to WV.
117. WV has since advised it will be attending site for an update on 22 July 2015. Alcoa will provide an update on the current status of the coal covering strategy during this visit.

Shire

118. Alcoa had discussions with Shire representatives in early June 2015. The meeting included providing an update on Alcoa's future fire risk mitigation and management strategies. No significant concerns were raised by the Shire in relation to Alcoa's fire strategies. The Shire is also part of the Surf Coast Mine Task Force, and attended the community consultation held by Alcoa on 13 July 2015 (see para 136-140, below).

DECREASING FIRE RISK BY HAVING AN EFFECTIVE EMERGENCY PLAN IN PLACE

119. Alcoa is reviewing its Emergency Plan to ensure future fire prevention, protection, mitigation and response plans are in place prior to 31 August 2015. The updated Emergency Plan will reflect the different risk profile for the Anglesea operations during the closure period.
120. The Emergency Plan will include response plans to any identified emergency event, including fire events, describing actions to be undertaken by both Alcoa and external parties. The Emergency Plan includes sections on:
- (a) general and facility information;
 - (b) emergency contacts;

- (c) emergency procedures;
 - (d) evacuation procedures;
 - (e) bushfire;
 - (f) coal fire; and
 - (g) various other emergency events.
121. The updated Emergency Plan will include relevant training for the security service monitoring the site, as well as procedures for the security service to follow when responding to any issues, including fire, they identify.
122. Alcoa's initial review of the Emergency Plan will be completed by 31 July 2015 with a draft updated plan then available for review by key stakeholders.
123. The process to review the Emergency Plan was discussed with the CFA on 8 July 2015, at which time it was agreed that Alcoa and the CFA will conduct a joint review of the updated Emergency Plan on 3 August 2015.
124. WV will be attending site on 22 July and 12 August 2015, and Alcoa expects to review the updated Emergency Plan with WV at that time.
125. A review and update of the Emergency Plan was highlighted as a key action identified in the Risk Assessment.

DECREASING FIRE RISK BY UPDATING OTHER ALCOA POLICIES, PRACTICES AND PROCEDURES

126. A review of the current SWI was initiated by Alcoa on 13 July 2015 to ensure future fire prevention, protection, mitigation and response plans are in place prior to 31 August 2015.
127. It is intended that the updated SWI will reflect the different risk profile and circumstances for the Anglesea mine post 31 August 2015.
128. This review is expected to be completed by 7 August 2015.
129. This document, and adequate training, will be provided to those people engaged to operate the retained Alcoa equipment post 31 August 2015, to ensure preparedness in the unlikely event of a coal fire. Any improvements identified during the training and communication will be incorporated into the SWI.

DECREASING FIRE RISK BY HAVING SUITABLE EQUIPMENT AVAILABLE TO MANAGE FIRES

130. Alcoa has committed to retaining one excavator, one wheel dozer and one 60,000 litre water cart for fire mitigation in the mine in the unlikely event that a coal fire occurs. Even though the risk of fire will be materially less following closure, this is the equipment that Alcoa currently uses to mitigate fires in the mine.
131. This equipment will be located in an appropriately safe and secure position on-site, and an appropriate maintenance and testing regime implemented to ensure that the equipment is functional.

132. Alcoa is currently undertaking a process to identify and engage adequately trained contractor personnel to operate this equipment. An agreement with respect to appropriate response times if the fire response plan is triggered will be entered into. These arrangements will be in place by 31 August 2015.

DECREASING FIRE RISK BY HAVING SUFFICIENT WATER SUPPLIES AVAILABLE TO MANAGE FIRES

133. It is anticipated that the following water sources will be available on-site over the 2015/2016 summer period:
- (a) the mine fire service dam (approximately 30 megalitres);
 - (b) the town water supply tank (approximately 82 kilolitres); and
 - (c) Ash pond number 2 (in excess of 170 megalitres).
134. Alcoa discussed this with the CFA on 8 July 2015 and the CFA indicated that this would be adequate.
135. As part of the review of the Pre-Incident Plan with the CFA, the process for accessing each of these water sources will be developed with provision for appropriate connecting points.

DECREASING FIRE RISK BY CONSULTING WITH THE COMMUNITY

136. On 18 May 2015 Alcoa held a Community Consultation Network meeting at the Anglesea Senior Citizens Club. This meeting was held to discuss the closure announcement and provide an opportunity for the community to raise any significant concerns. During this meeting fire risk was raised as an issue and Alcoa told the meeting that "part of the mine closure plan will be eliminating the risk of coal mine fire in the future. The intention is that the mine site's exposed coal will be covered by 31 August." This was subsequently documented in the meeting snapshot provided to all attendees.
137. Alcoa attended the Hazelwood Coal Mine Fire Inquiry Anglesea community consultation meetings on 28 June 2015. This provided insight into community concerns with respect to fire risk, management and mitigation.
138. Alcoa held a further Community Consultation Network meeting on 13 July 2015 at the Anglesea Senior Citizens Club. This meeting was attended by 50 people including 27 community members, and various representatives from DEDJTR, EPA, DELWP, Hazelwood Mine Fire Inquiry Board, the Shire and Alcoa. At this meeting Alcoa discussed the current (interim) strategy to mitigate future fire risk, including that:
- (a) all horizontal coal was expected to be covered by approximately one metre of overburden by 31 August 2015; and
 - (b) part of the west wall (approximately 850 metres long and 5 – 15 metres high) would remain exposed until the future closure plan is implemented.
139. The map referenced in the Risk Assessment was displayed during the meeting to further explain the Overburden Strategy.
140. Alcoa also displayed a PowerPoint slide at the meeting to advise that future fire risk mitigation would include:
- (a) Coverage of exposed coal (approximately 41 ha as at 28 May 2015);

- (i) Eliminate ember attack risk; and
- (ii) Reduce already low spontaneous combustion risk;
- (b) Alcoa to remain accountable for site from 1 September 2015;
- (c) Onsite 24/7 security from 1 September 2015;
- (d) Ongoing station and mine routine inspections;
- (e) Retain excavator, wheel dozer, water cart;
- (f) Retain onsite water availability;
- (g) Review/update Emergency Management Plan;
- (h) Review/update Pre-Incident Plan;
- (i) Engaged with CFA;
- (j) Independent Technical Review completed – endorses strategy; and
- (k) Risk Assessment completed – low risks.

A number of questions were asked, however no significant concerns were raised with the proposed strategy.

DECREASING FIRE RISK AT THE HEATH

- 141. Alcoa's involvement with the Anglesea Heath will be reviewed in light of the decision to close the Anglesea operations, and following discussions with the relevant Government agencies. Alcoa anticipates that there will be a period of transition in respect of the management of the Anglesea Heath, rather than any immediate change or end to the current arrangements.
- 142. For the 2015/2016 summer season, Alcoa expects that the current arrangements in respect of fire management in the Anglesea Heath will continue:
 - (a) DELWP and PV will remain the authorities responsible for the management of fire risk;
 - (b) Alcoa will continue to be a stakeholder for consultation only, providing feedback and input into DELWP's fire management and prevention strategy, predominantly from an ecological perspective;
 - (c) Alcoa will provide consent for DELWP to conduct fire prevention works within the leased area; and
 - (d) Alcoa will provide access to the Heath for fire prevention activities, including fuel reduction burns, and water supply.

CONCLUSION AND RECOMMENDATION

Conclusion

- 143. The current risk of fire at the Anglesea coal mine is low.

144. Cessation of operations at the mine and power station will reduce this already low risk of fire even further.
145. The Anglesea coal mine will be well managed after mining operations cease on 31 August 2015, as Alcoa has a well-established, experienced team that will assume control of the site on 1 September 2015. This team will manage the site over the 2015/2016 summer season, and will have access to Alcoa's significant mining and mine rehabilitation expertise.
146. The management team will be supported by a 24/7 appropriately trained on-site security presence. Site management, site security services, and external response resources will have access to appropriate fire fighting equipment to be retained on site, as well as sufficient water supplies for fire suppression purposes.
147. An updated Emergency Plan and CFA Pre-Incident Plan will be in place for the 2015/2016 summer season, which will reflect the new risk profile associated with the mine following cessation of operations. These will have been reviewed by the relevant authorities including CFA and WV.
148. Alcoa's overarching strategy when it comes to managing fire risk at the mine post closure in the 2015/2016 summer season is to cover all exposed coal within the mine (with the exception of the west wall) with approximately one metre of overburden by 31 August 2015. Alcoa is confident that strategy 2 recommended by Mining One will continue to result in a low fire risk for the exposed west wall of the mine during the 2015/2016 summer season.
149. The outcomes of the Risk Assessment carried out by Alcoa have informed the Overburden Strategy, which in turn has been reviewed both internally (Alcoa Mining) and externally (Technical Review).
150. The Overburden Strategy has also been discussed with, and supported by, relevant Government agencies.
151. The internal and external review of the Overburden Strategy, and discussions with relevant Government agencies, shows that the Overburden Strategy, in combination with the other actions being implemented by Alcoa at the Anglesea site, are sustainable, practical and effective actions for Alcoa to take to reduce the already low risk of fire at the mine in the 2015/2016 summer season.

Recommendation

152. Alcoa submits that the Board should recommend that Alcoa continues to implement the actions outlined in Part B of this submission, as those actions have been shown to be sustainable, practical and effective actions to decrease the risk of fire arising from or impacting on the mine over the 2015/2016 summer season.