

IN THE MATTER OF THE HAZELWOOD MINE FIRE INQUIRY

WITNESS STATEMENT OF ROMEO JOSEPH PREZIOSO

1. My name is Romeo Joseph Prezioso.
2. My work address is Brodribb Road, Hazelwood Victoria.
3. I am employed by the Hazelwood Power Corporation at the Hazelwood Coal Mine (“**Mine**”) as a Senior Mine Planner.
4. I have worked at the Mine for approximately thirty years in various roles, including as a Mine Planner, a Mine Field Coordinator and a Mine Planning Superintendent.
5. Between 2006 and 2008, I was employed at the Mine as the Fire Services Officer.
6. On Thursday 29 May 2014, I gave evidence to the Inquiry in relation to the events of Sunday 9 February 2014, in light of the Emergency Commander role that I assumed on that day.
7. I have been requested to provide a witness statement in relation to the implementation of recommendations arising out of the following reports in relation to previous significant fires at the Mine:
 - a. October 2006 Mine Fire Investigation – Incident Investigation Report, which was prepared by GHD in January 2007 (“**2006 GHD Fire Report**”); and
 - b. September 2008 Mine Fire – Incident Investigation Report, which was prepared by GHD in December 2008 (“**2008 GHD Fire Report**”).
8. Copies of the 2006 GHD Fire Report and the 2008 GHD Fire Report are annexed to the witness statement of Robert Dugan.

(1) Recommendations arising from 2006 GHD Fire Report

Background

9. The 2006 GHD Fire Report contained, in Part 5, a series of recommendations for preventative and corrective actions to “*address deficiencies in system defences and organisational processes*”.
10. The 2008 GHD Fire Report contained, in Appendix A, a review of whether the recommendations from the 2006 GHD Fire Report had been implemented.
11. In the following paragraphs, I describe the recommendations made in the 2006 GHD Fire Report, and the findings of the 2008 GHD review of their implementation.

Comments on specific recommendations

12. Recommendation 1 within the 2006 GHD Fire Report was as follows: “*In July of each year, a plan should be developed for the upcoming fire season based on weather predictions and mine conditions. Note that with the current conditions, a fire season may need to be designated from October to March.*”
13. As shown in item 1 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.
14. Recommendation 2 within the 2006 GHD Fire Report was as follows: “*An annual audit of the fire system should be undertaken prior to the start of the fire season in accordance with the*

fire season plan (Refer to Recommendation 1). The audit should review all aspects of the fire service facilities, systems and procedures. This should include hardware, documentation (e.g. emergency response plans), fire pumps and electrical supply, spray coverage of coal levels and fire fighting training, etc.”

15. As shown in item 2 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.
16. Recommendation 3 within the 2006 GHD Fire Report was as follows: *“Predefined conditions should be identified to assist in determining whether a Fire Alert should be declared. The criteria should not be based solely on CFA Total Fire Bans as the CFA criteria includes factors relating to conditions that are not applicable to an open-cut coal mine. These conditions should include ranges in temperature, humidity, wind direction or speed that can define “severe weather conditions.”*
17. As shown in item 3 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.
18. Recommendation 4 within the 2006 GHD Fire Report was as follows: *“Fire Alert processes are understood but are not always fully complied with. As the Fire Alert is a critical control to prevent fires, the procedures including roles and responsibilities should be reviewed, updated, reiterated and enforced for mine personnel.”*
19. As shown in item 4 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.
20. Recommendation 5 within the 2006 GHD Fire Report was as follows: *“Roles and responsibilities of Fire Services and personnel to support Fire Services during a Fire Alert and in an incident should be reviewed. The review should cover the responsibilities and tasks required by the Fire Services Group including the Fire Services Officer, Supervisor and Operators for the normal daily tasks, during a Fire Alert and during an incident. The review should also cover which mine personnel or contractors would provide a valuable and effective resource to support Fire Services during a Fire Alert and an incident dependent on their roles and responsibilities. For instance, utilising the maintenance crew for additional fire spotting after a Fire Alert has been declared. Refer to Appendix D for Organisational responsibilities in Fire Prevention.”*
21. As shown in item 5 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.
22. Recommendation 6 within the 2006 GHD Fire Report was as follows: *“Interface and communications between Operations, Fire Services and Maintenance needs to be reviewed in terms of fire systems, particularly in relation to the power supply for the fire pumps.”*
23. As shown in item 6 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed and was further assessed as having been demonstrated effectively during the 2008 fire.
24. Recommendation 7 within the 2006 GHD Fire Report was as follows: *“Roles, responsibilities and procedures outlined within the IPRH Emergency Response Plan should be reviewed and rewritten utilising a checklist approach so that each person undertaking an emergency role can confirm that they are undertaking their key activities.”*
25. As shown in item 7 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed. GHD further noted that the role checklist was quite high level, and could be improved to assist the emergency response roles.
26. Recommendation 8 within the 2006 GHD Fire Report was as follows: *“In a significant fire, each coal level should be treated as a fire zone and a Zone leader allocated after consultation with the CFA.”*

27. As shown in item 8 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed. However, GHD noted that it was not well executed during the 2008 fire. However, as detailed by Robert Dugan in his evidence to the Inquiry on 28 May 2014, a sector approach was successfully implemented during the 2014 fire, in consultation with the CFA.
28. Recommendation 9 within the 2006 GHD Fire Report was as follows: *“Once it has been determined that there is a significant fire, all supervisors should return to the ICP [Incident Control Point] for a briefing and to undertake a role of co-ordinating the fire teams. A co-ordinated approach to fighting fires is more effective than just large numbers of fire fighters.”*
29. As shown in item 9 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed. GHD further noted that this was a significant improvement during the 2008 fire.
30. Recommendation 10 within the 2006 GHD Fire Report was as follows: *“The ICP should continue to be established as a special facility separate from normal operations or mine activities. The ICP should have available all essential equipment required for an emergency response, that is easily and quickly accessible; and able to be transported to any onsite facility. This equipment may be available as a mobile ‘kit’.”*
31. As shown in item 10 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed. GHD noted that the completion of this recommendation *“contributed significantly to the improved management of the 2008 fire”*.
32. Recommendation 11 within the 2006 GHD Fire Report was as follows: *“IPRH should consider notifying the CFA immediately once a spot fire has been reported and verified on site. The CFA remains on alert for a nominated amount of time (eg. 15 minutes). Within this time frame they must receive further notification from the site that the fire has been extinguished otherwise they will send out an initial response crew in anticipation that the fire has escalated and requires their assistance. This practice is undertaken at other mines in Latrobe Valley.”*
33. As shown in item 11 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed. However, GHD noted that at the time of the 2008 GHD Fire Report, *“some confusion still exists within IPRH and also within CFA as to when the CFA should be notified”*. The Emergency Response Plan, section 21, and Mine Fire Instructions, section 7.1, were subsequently updated to address this issue, following consultation with the CFA.
34. Recommendation 12 within the 2006 GHD Fire Report was as follows: *“The IPRH Significant Issue Corporate Response Plan and the IP Corporate Serious Incident Procedure should be reviewed and updated to ensure there are no discrepancies and the IPRH Emergency Response Plan should be consistent with the IPRH Significant Issue Corporate Response Plan.”*
35. As shown in item 12 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.
36. Recommendation 13 within the 2006 GHD Fire Report was as follows: *“Work procedures and practices within the ‘Mine Fire Service Policy and Code of Practice’ and the ‘Fire Instructions’ should be systematically reviewed and updated.”*
37. As shown in item 13 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.
38. Recommendation 14 within the 2006 GHD Fire Report was as follows: *“Whilst it should be recognised that the priority is to ensure that sufficient water is used to control the spread of fires, particularly to ensure no burning coal is transferred to the power station, mine operations should be trained to understand the effects of excessive water transferred to the power station.”*

39. As shown in item 14 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.
40. Recommendation 15 within the 2006 GHD Fire Report was as follows: *“The use of thermal imaging cameras and other technology in the detection of faulty idlers should be investigated for their application and used where appropriate.”*
41. As shown in item 15 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.
42. Recommendation 16 within the 2006 GHD Fire Report was as follows: *“The use of thermal imaging cameras was effective during the fire fighting and should be considered as well as other technology for wider use in spotting fires within the mine.”*
43. As shown in item 16 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed, however GHD noted that the use of thermal imaging could be extended further. Thermal imaging was used extensively in the 2014 fire.
44. Recommendation 17 within the 2006 GHD Fire Report was as follows: *“A procedure for dealing with Carbon Monoxide (CO) during fire fighting, including the use of CO monitors, should be developed since personnel safety is a major responsibility and concern in fighting coal fires.”*
45. As shown in item 17 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed. GHD further noted that it was still an ongoing issue, although a number of actions had been completed. As detailed in the evidence of Robert Dugan and Steven Harkins to the Inquiry (respectively, 28 and 30 May 2014), Hazelwood utilised CO monitors during the 2014 Mine fire from an early stage, and had CO management policies, developed in consultation with the CFA.
46. Recommendation 18 within the 2006 GHD Fire Report was as follows: *“Whilst the efforts of all mine, contractor and CFA personnel are highly commended in their assistance with the fire fighting, it should be emphasised and reinforced to all personnel that no job is so important that they should take excessive risks.”*
47. As shown in item 18 of Appendix A to the 2008 GHD Fire Report, this recommendation was assessed as having been completed, however GHD commented that it should again be re-emphasised. This recommendation was successfully implemented during the 2014 Mine fire, with the regular briefings of fire fighting personnel run by the Mine, emphasising the importance of safety.
48. Recommendation 19 within the 2006 GHD Fire Report was as follows: *“Allocating IPRH operations staff to CFA strike teams during a fire should be included within IPRH procedures (e.g. Emergency Response Plan and/or Fire Instructions) and reinforced so that it becomes normal practice.”*
49. As shown in item 19 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed, but should again be re-emphasised. The Emergency Response Plan, section 6.8, was subsequently updated to include reference to escorts. During the 2014 Mine fire, on Sunday 9 February 2014, Hazelwood escorts were arranged for CFA trucks entering the Mine. Throughout the 45 day fire fighting operation, Hazelwood personnel were embedded within teams of CFA fire fighters.
50. Recommendation 20 within the 2006 GHD Fire Report was as follows: *“To ensure that the ongoing efficient operations of the mine are not compromised over the long term as a result of the fire incident, a detailed risk analysis should be carried out to assess the life cycle impact of the fire on maintenance costs and longevity of the mine infrastructure assets.”*
51. As shown in item 20 of Appendix A to the 2008 GHD Fire Report, this recommendation was completed.

Additional comments

52. The implementation by the Mine of the 20 recommendations arising from the GHD 2006 Fire Report was overseen by a range of regulators, including the Department of Primary Industries (“DPI”), now known as the Department of State Development Business and Innovation (“DSDBI”).
53. I note that as a direct result of the 2006 fire, the following fire policy documents were produced:
 - a. Guidelines for Season and Period Specific Fire Preparedness And Mitigation Planning;
 - b. Guidelines for Season Specific Fire Preparedness and Mitigation Planning;
 - c. Check List For Fire Fighting Equipment Annual Audit and Inspection; and
 - d. Check List For Season Specific Fire Preparedness and Mitigation Planning.
54. In addition, the following fire policy documents (which were reviewed annually) were updated to reflect the recommendations from the 2006 GHD Fire Report:
 - a. Fire Service Code of Practice;
 - b. Emergency Response Plan; and
 - c. Mine Fire Instructions.

(2) Implementation of recommendations arising from 2008 GHD Fire Report

Background

55. The 2008 GHD Fire Report contained, in Part 6, a series of recommendations for preventative and corrective actions to “*address deficiencies in system defences and organisational processes*”.
56. Annexed to this witness statement as **Annexure 1** is an extract from the Mine’s Paradigm II system. Paradigm II is a software system maintained by the Mine to manage compliance. Individual employees of the Mine with responsibility for taking or overseeing actions record the steps taken in Paradigm II. The Paradigm II extract at **Annexure 1** contains the Action Items developed in response to the recommendations in the 2008 GHD Fire Report, and the status of the Action Items.
57. Annexed to this witness statement as **Annexure 2** is a report prepared by Stan Kemsley, the Technical Compliance Manager at the Mine, dated 29 June 2012. The report includes a table which lists the recommendations from the 2008 GHD Fire Report and states whether they have been addressed, and whether they have, in Mr Kemsley’s view, been effective.
58. In the following paragraphs, I have set out the recommendations from the 2008 GHD Fire Report, and what steps the Mine has taken to address them. Unless I have stated otherwise, the extracts from the Paradigm II system are consistent with Mr Kemsley’s report.

Comments on specific recommendations

59. Recommendation 1 within the 2008 GHD Fire Report was as follows: “*Improved integration between IPRH and CFA*”.
60. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for this recommendation, and it was noted as complete on 5 August 2009. The entry stated that a meeting was held with the CFA at the Mine Office on 24 June 2009. The entry noted that the

Mine was awaiting further information from the CFA, and that “*Integration could possible involve familiarisation days & or training in the techniques for fighting coal fires conducted on the mine site*”. These measures were subsequently implemented, with the Mine regularly hosting training and site familiarisation days for the CFA Morwell Group comprising Yinnar and Churchill CFA (see Robert Dugan witness statement at paragraph 35).

61. Recommendation 2 within the 2008 GHD Fire Report was as follows: “*Allocate IPRH personnel to CFA strike or zones/sectors teams as required.*”
62. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for this recommendation, and it was noted as complete on 8 February 2010. The recommendation was completed in then-section 4.7 (now section 6.8) of the Emergency Response Plan.
63. Recommendation 3 within the 2008 GHD Fire Report was as follows: “*IPRH ER personnel should utilise a handover form and log sheet similar to that of the CFA.*”
64. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for this recommendation, and it was noted as complete on 5 August 2009. The entry stated that a meeting was held with the CFA at the Mine Office on 24 June 2009, and that the Mine was awaiting further information from the CFA. In the 2014 fire, the Mine kept registers of Hazelwood personnel entering and exiting the Mine as part of the fire fighting operations.
65. Recommendation 4 within the 2008 GHD Fire Report was as follows: “*Develop a mine safety briefing video and coal mine fire fighting techniques video.*”
66. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation. The Paradigm II system entry at **Annexure 1**, and Stan Kemsley’s 2012 Report at **Annexure 2**, notes this recommendation was not implemented, and that a video existed on fire fighting techniques, but that it was to be reviewed to be brought up to date. Whilst this review was not completed, a greater emphasis was placed on “hands-on” fire fighting training following the 2008 fire, which in my view is more effective than a video.
67. Recommendation 5 within the 2008 GHD Fire Report was as follows: “*The annual audit of the fire system must include the fire system and access in non-operational areas*”.
68. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation, and it was implemented in September 2009. The system includes a comment that the annual fire service audit was updated to include a plan showing the mine access roads to operational and non-operational areas.
69. Recommendation 6 within the 2008 GHD Fire Report was as follows “*A risk assessment should be undertaken on the non-operational areas to determine if further prevention work is required. The risk assessment should include a Cost/ Benefit Analysis.*”
70. The implementation of this recommendation is discussed in detail below.
71. Recommendation 7 within the 2008 GHD Fire Report was as follows: “*A number of potential improvements to the ICP at the Training Centre were identified and should be considered.*”
72. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation, and it was noted as complete on 1 July 2009. The Paradigm II entry notes that the changes included the addition of a store room to the building exterior to enable the dispatch of items in a more efficient and controlled manner and the addition of a new entry door on the north side of the building for the registration of personnel attending an emergency event.
73. Recommendation 8 within the 2008 GHD Fire Report was as follows: “*A number of potential improvements to fire fighting equipment were identified and should be considered.*”

74. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation, and it was noted as complete on 1 July 2009. The Paradigm II entry notes that pumps for boosting water pressure had been purchased and were ready for use as required. The entry notes that the pumps would assist the crane monitors when fighting fires located high in the coal faces. Further, the existing crane monitors were being rebuilt to handle harsh conditions in the mine.
75. Recommendation 9 within the 2008 GHD Fire Report was as follows: *"IPRH should improve the practical fire fighting skills through training in advanced coal mine fire fighting techniques"*.
76. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation, and it was noted as complete on 20 July 2009. Mr Kemsley's report stated that this recommendation was *"considered but insufficient resources"*. However following the 2008 fire, the Mine's fire training was enhanced to focus on practical skills. Fire training sessions run at the Mine now include a theory session, and a practical skills session, which may involve:
- a demonstration of coal and oil fires, in response to which the use of different fire fighting infrastructure within the Mine is demonstrated, including extinguishers, hydrants, sprays and the Mine fire tanker; and
 - a practical demonstration of setting up the crane monitors (for the maintenance gang).
77. Recommendation 10 within the 2008 GHD Fire Report was as follows: *"Pre-existing geological hot spots need to be better monitored."*
78. As shown in the Paradigm II system entry at **Annexure 1**, Duncan Orr (a former Civil Engineer at the Mine, now deceased) and I were responsible for overseeing the implementation of this recommendation, and it was noted as complete on 18 March 2010. The entry further noted that through consultation with the Mine planning and engineering group, a regular report and inspection of all known hot spots was conducted. The entry notes that the report was in the form of an A3 sheet outlining the mine detail, identifying all known areas and recommending action items if required.
79. Recommendation 11 within the 2008 GHD Fire Report was as follows: *"Review selection criteria for purchasing Thermal Imaging cameras."*
80. As shown in the Paradigm II system entry at **Annexure 1**, Steve Dargan and I were responsible for overseeing the implementation of this recommendation, and it was noted as complete on 8 September 2009. The entry stated that the Mine was in the process of establishing a large scale Thermal Imaging Camera, which was expected to be operating prior to the start of the 2009/2010 fire season. The camera was operating by that fire season, and has been used by the Mine in a fire and emergency context since then.
81. Recommendation 12 within the 2008 GHD Fire Report was as follows: *"Consider developing an IPRH Welfare Officer role to monitor CO, fatigue, time spent in the mine, etc."*
82. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation, and it was noted as complete on 11 June 2009. The entry noted that the role of Welfare Officer was contained in then-section 4.18 (now section 6.16) of the Emergency Response Plan for the Mine, which was a newly created role responsible to the emergency coordinator, with responsibility for the overall welfare of all personnel responding to the emergency.
83. Recommendation 13 within the 2008 GHD Fire Report was as follows: *"Consider establishing a role with responsibility for access and infrastructure"*.
84. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation, and it was noted as complete on 11 June 2009. The entry noted that the role of Field Officer was contained in then-section 4.6 (now section

6.5) of the Emergency Response Plan for the Mine. The entry also noted that the Field Officer role had expanded to include a responsibility to co-ordinate requirements to ensure that access to emergency areas and civil infrastructure is maintained throughout the emergency, such as mine roads, surface drainage, water supply and pumping infrastructure.

85. Recommendation 14 within the 2008 GHD Fire Report was as follows: “*Consider establishing a role with responsibility for monitoring water supply*”.
86. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation, and it was noted as complete on 11 June 2009. The entry also noted the Field Officer role which I have set out above, and the role of Logistics Officer. In respect of the Logistics Officer role, the entry stated that the role had expanded to include responsibility for providing support for civil infrastructure, such as the power supply to pump stations, building, lighting and power.
87. Recommendation 15 within the 2008 GHD Fire Report was as follows: “*Identify potential roles and personnel from the Power Station or Administration.*”
88. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation, and it was noted as complete on 11 June 2009. The entry noted two newly-created roles in the Emergency Response Plan, being that of Welfare Officer and Information Technology Support Officer.
89. Recommendation 16 within the 2008 GHD Fire Report was as follows: “*Review status of recommendations from October 2006 fire investigation.*”
90. As shown in the Paradigm II system entry at **Annexure 1**, I was responsible for overseeing the implementation of this recommendation, and it was noted as complete on 14 May 2009. The entry noted that the October 2006 recommendations had been reviewed as part of the GHD 2008 Fire Report.

(3) Implementation of recommendation 6 from the GHD 2008 Fire Report

91. The 2008 Mine fire was found to have likely been caused by a flare up of a fire hole on the southern batters of the Mine. Early efforts to fight the fire had been hampered by a lack of available water at that location, and by access issues (with Mine infrastructure such as conveyors impeding the fire fighting vehicles’ egress on the relevant levels of the batter).
92. Recommendation 6 of the GHD 2008 Fire Report was as follows:

A risk assessment should be undertaken on the non-operational areas to determine if further prevention work is required. The risk assessment should include a Cost/Benefit Analysis.

A range of options have been identified in terms of prevention of hot spots from reigniting and detection of hot spots.

93. As I understood it at the time, the key issues of concern, underpinning various recommendations arising from the GHD 2008 Fire Report, including recommendation 6, were as follows:
 - (1) Improving access to worked out batters such as the southern batter; and
 - (2) Ensuring early detection of “flare ups” of hot spots within the Mine.
94. I have contacted the GHD Incident Investigation Leader responsible for the GHD 2008 Fire Report, Simon Casey (who has recently left GHD), in the course of preparing this witness statement. He has indicated to me that he would not have necessarily expected that the Mine

would obtain, or produce, a formal risk assessment report in response to this recommendation.

95. My understanding at the time was that the risk assessment referred to in recommendation 6 was intended to be focussed on access to, and early detection of, hot spots.
96. A draft version of the 2008 GHD Fire Report that I have located is consistent with this recollection (copy at **Annexure 3**). In this draft report, the risk assessment is listed as part of recommendation 10, which provides as follows:

RECOMMENDATION 10

A risk assessment should be undertaken on the non-operational areas to determine if further prevention work is required. The risk assessment should include a Cost/Benefit Analysis.

A critical element of the initial response and the ongoing emergency response was the lack of fire water supply to the non-operational areas and the restrictions in access due to the conditions of the roads, the accumulation of debris and that the some batters did not have road access.

The annual audit should include fire water supply to non-operational areas, access and housekeeping.

A range of ideas were identified in the brainstorming session (refer Appendix B) in terms of prevention of hot spots from reigniting and detection of hotspots.

97. Appendix D (Brainstorming Session Minutes) of the draft GHD 2008 Fire Report relevantly included the following ideas in relation to Detection and Monitoring:

- ***New or significant improvements to existing processes:***
 - *Thermal imaging to detect fires. Determine how many and required performance. Consider integrating the monitoring into fire systems.*
- ***Left field ideas and suggestions from other sites/ industries:***
 - *Buried thermocouples for hot spots.*

98. In response to recommendation 6 in the final GHD 2006 Fire Report, I undertook a range of actions over a period of several years, in conjunction with Duncan Orr. These actions are detailed below.

Hot spot inspection reports

99. I developed a pro forma risk assessment with Duncan Orr for monitoring known hot spots within the Mine.
100. The specific steps in the development of this risk assessment protocol were as follows:
 - a. On 10 December 2008 at the Mine Planning and Scheduling Meeting it was noted that:
 - i. I was to prepare a register of known hotspots; and
 - ii. Duncan Orr was to include the registered fire holes on the weekly batter stability routine,

(see Minutes at **Annexure 4**).

- b. On 18 December 2008, I prepared a map showing known hotspots. This map was the pro forma for the inspection reports later completed by Duncan Orr (referred to below). The date the pro forma was completed is stamped in the bottom left corner of each of the Monthly Hotspot Inspection Reports.
- c. On 24 December 2008 at the Mine Planning and Scheduling Meeting it was noted that:
 - i. I had prepared a register of known hotspots; and
 - ii. Duncan Orr was to include the registered fireholes on the weekly batter stability routine,

(see Minutes at **Annexure 5**).

101. From about February 2009 to April 2013, Duncan Orr (and after he passed away in about February 2013, Alex Chisholm) completed a Monthly Hotspot Inspection Report with respect to the known hotspots that I had marked on a map.

102. Examples of the Monthly Hotspot Inspection Reports between February 2009 and April 2013 are at **Annexure 6**.

Trial of thermal imaging camera

103. Duncan Orr trialled the use of a thermal imaging camera to detect hot spot flare ups within the Mine. After a period of time, however, Duncan determined that the thermal imaging camera was not very effective at identifying hot spot flare ups, particularly during the day, when he was out in the field undertaking the inspections. On this basis, Duncan continued with visual inspections, where he assessed hot spot flare ups by sight and smell.

Consideration of buried thermocouples

104. I considered the installation of heat sensors (buried thermocouples) in the vicinity of the known hot spots, in response to one of the brainstorming ideas referred to in the draft GHD 2008 Fire Report.

105. Sensors of this nature may have been able to deliver an automated alert of an increase in the coal temperature (indicating a potential flare up in a proximate hot spot). However, I did not consider that the Mine should proceed with works of this nature, on the basis that:

- a. I had concerns about the reliability of equipment of this nature, and of the potential implications of its failure, if it were relied upon as the primary means of monitoring hot spots. Geotechnical equipment installed throughout the Mine can have reliability issues, given the conditions within the Mine (heat, cold, wind, rain, dust and in some areas, ground movements). I was of the view that visual inspections on a regular basis would be a more reliable means of monitoring the hot spots; and
- b. I determined that it was not cost effective to deliver power to equipment at the locations of the known hot spots (northern batters, southern and south eastern batters) given the distances involved.

Audit of access and water supply to “worked out” batters

106. In response to the recommendations in the GHD 2008 Fire Report, the Mine’s fire service plan was updated to incorporate an annual audit of non-operational areas of the Mine. As part of this annual audit, Mine personnel drive into those areas of the Mine and conduct a physical audit of the infrastructure and access.

107. The audits assess any difficulties encountered with obtaining access to the area, and then assess the water supply (including the reticulated fire service pipes in the area). As a result of

the audits, various improvements have been made to the water supply, including the repair or installation of new pipes, valves, sprays and other mechanisms.

108. In around 2012, the Mine's annual fire-fighting equipment audit was also enhanced to more comprehensively address the non-operational areas of the Mine. The 2009-2010 Fire Equipment Audit (**Annexure 7**) did not include a detailed audit of the non-operational areas of the Mine. By contrast, the 2013-14 Fire Equipment Audit (**Annexure 8**) directly addressed the southern, south-eastern and northern batters (at pages 48 to 50). The annual audit now assesses access conditions and the condition of the fire services infrastructure at the worked out areas of the Mine.

Removal of infrastructure

109. One of the key issues identified in the GHD 2008 Fire Report was the issue of obtaining access to worked-out batters. In the 2008 Mine fire, disused Mine infrastructure impeded access to the fire by Mine vehicles with fire fighting capabilities, and CFA tankers.
110. Further, there were limited accessible roads on the relevant levels of the southern batters.
111. One of the key measures undertaken in order to implement Recommendation 6 was the removal of disused infrastructure on the southern batters, such as a conveyor and ARMCO vehicle crossing, which improved access considerably. A road was also realigned to create better access.

Earthworks

112. The Mine has also dug out and recapped with clay the known hot spots within the Mine on several occasions in the period since 2008.

Other actions relevant to monitoring hot spots

113. From about December 2012, Robert Dugan included the results of the monthly inspection of the "Fire Hot Spots status throughout the Mine" as part of the Fire Management Systems – Weekly Status "Rag Reports". Examples of the Rag Reports dated 17 December 2012, 31 December 2012, 7 January 2013, 21 January 2013 and 9 December 2013 are at **Annexure 9**. The Rag Report for the week commencing 3 February 2014 is Annexure 13 to Robert Dugan's witness statement.
114. In December 2009, GHD provided a draft Report for Major Mining Hazards Assessment in response to a request by the Mine. The report identified Mine Fires as such a risk including spontaneous combustion of reactive coal (p.12). In Appendix A, it identified visual hot spot monitoring as a control system for spontaneous combustion (p. 32/51). A copy of this GHD report is at **Annexure 10**.
115. The Major Mine Hazards Risk Assessments and Control Measures have been adopted and kept up-to-date. Attached as **Annexure 11** is a Bow-Tie diagram relating to Spontaneous Combustion dated 22 October 2012. As part of the Control Measures for hotspots under this Risk Management Process, System Control 0303 is Visual Hot Spot Monitoring. The performance Elements of the Control Measure include Tri-weekly monitoring by the 1 x 7 crew and shift monitoring by the 2 x 12 operations crew. A copy of System Control 0303 is at **Annexure 12**.

ROMEO JOSEPH PREZIOSO