



STATE CORONER'S COURT OF NEW SOUTH WALES

Inquiry:	The State Mine Fire, (also known as the bushfire starting at Marrangaroo Training Area), Lithgow on 16 October 2013
Hearing dates:	30 April 2019
Date of findings:	14 May 2019
Place of findings:	State Coroners Court, Lidcombe
Findings of:	Deputy State Coroner E. Truscott
Catchwords:	Coronial Law- General Inquiry into Fire-Origin and Cause
File number:	2013/324779
Representation:	<p>Counsel Assisting : Ms C Stern SC and Ms A. Mitchelmore SC instructed by Alexander Jobe of the Office of General Counsel</p> <p>Rural Fire Service: Mr N Newton instructed by Ms H Allison of Crown Solicitors Office</p> <p>Commonwealth of Australia (as represented by the Department of Defence): Ms G. Wright instructed by Ms F Bradshaw of Maddocks Lawyers.</p>
Findings:	The State Mine Fire was caused on 16 October by a demolition serial conducted by ADF personnel at the Marrangaroo Training Area. The fire spread extensively, in particular having regard to the weather conditions over the period 16-17 October 2013, causing damage to property but no serious injury or loss of life.
Recommendations:	Nil

Glossary

AAR	After Action Review
ADF	Australian Defence Force
AWS	Automatic Weather Stations
BMP	Bushfire Management Plan
COI	Commission of Inquiry
DEOTS	Defence Explosive Ordnance Training School
DOTAM	Director of Operations and Training Area Management
DTAMM	Defence Training Area Management Manual
EI&G	Estate and Infrastructure Group
EO	Explosive Ordnance
EOD	Explosive Ordnance Disposal
HEAT	High Explosive Anti-Tank
IMT	Incident Management Team
MAB	Marrangaroo Army Base
MAA	Mutual Aid Agreement
MOU	Memorandum of Understanding
MTA	Marrangaroo Training Area
UXO	Unexploded Ordnance
PRDD	Permanent Range Demolitions Detail
RCO	Range Control Officer
RFS	NSW Rural Fire Service
RSO	Range Standing Orders
UAV	Unmanned Aerial Vehicle

IN THE STATE CORONER'S COURT
LIDCOMBE
NSW

SECTION 81(2) CORONERS ACT 2009

Coronial Inquiry into the Fire at Marrangaroo Army Base ("State Mine Fire")

Introduction

1. This is an inquiry held pursuant to s 30 of the *Coroners Act 2009 (NSW)* (**the Act**) into the bushfire which started on 16 October 2013 at the Marrangaroo Training Area (**MTA**) in Lithgow. The fire is known as the State Mine Fire.
2. The State Mine Fire destroyed a number of industrial, residential and commercial buildings. No significant injury or loss of human life has been attributed to the Fire though some fire fighters sustained minor injuries such as cuts, strains and minor burns.
3. On 22 April 2015, the State Coroner gave a direction under s 32(4)(b) of the Act for a General Inquiry concerning the State Mine Fire.
4. Section 32(3) provides that: "A coroner is required to hold a general inquiry concerning a fire or explosion that has destroyed or damaged property within the State if the State Coroner gives a direction under this section for such a general inquiry to be held."
5. Accordingly, this hearing proceeded as a general inquiry into the State Mine Fire under s30(2) so that I may examine not only the cause and origin of the fire but

all of the circumstances concerning the fire – s30(3). I must make findings under s 81(2) of the Coroner’s Act. Under s82 I can make such recommendations as I consider necessary or desirable in relation to any matter connected with the fire.

6. Leave to appear at the inquiry has been granted to the Rural Fire Service, the Commonwealth of Australia (as represented by the Department of Defence), the Mount Wilson and Mount Irvine Rural Fire Brigade, NSW Fire and Rescue (who in September 2018 advised that they did not intend further to appear or be represented) and the Zig Zag Railway (who in November 2018 advised that they do not propose further to appear or be represented). On 10 April 2019 the Mount Wilson and Mount Irvine Rural Fire Brigade likewise advised that they do not propose to further appear or be represented.
7. The State Mine Fire has been the subject of a substantial investigation on the part of the Australian Defence Force (**ADF**), in the form of a Commission of Inquiry which reported in January 2014. The findings of that inquiry are not the subject of any dispute, and are of significant assistance to me in terms of making the findings under s 81(2) of the Coroners Act as to the cause and origin of the fire and in examining the circumstances of the fire more generally.
8. The Commission of Inquiry made recommendations which the ADF has sought to implement. A number of the recommendations flowing from the Commission of Inquiry involved the ADF working closely with the NSW Rural Fire Service (**RFS**).
9. The ADF has, among other things, purchased new fire-fighting equipment, increased hazard reduction and mitigation measures at the MTA, revised the plans and procedures dealing with the conduct of live fire exercises in bushfire season (for the MTA and more generally), and increased the level of communication and liaison between it and the RFS.
10. Those assisting me briefed an expert, Mr Richard Woods AFSM, of Wildfire Investigations and Analysis Pty Ltd. Mr Woods examined the adequacy of the

steps that have been taken since the State Mine Fire. Mr Woods is of the view that those steps are both adequate and reasonable.

11. The RFS also undertook an After Action Review (AAR) in relation to the State Mine Fire, and has implemented the recommendations flowing from that Review. There are no issues in relation to the adequacy of that response.
12. Consequently, there are no unresolved issues or matters which require further scrutiny or examination. There are no witnesses who have provided statements to this inquiry who should be examined. Accordingly, this hearing proceeded by the tender of the brief of evidence which comprises 6 large volumes of documentary evidence at Tabs 1 to 155.
13. The brief of evidence contains a number of documents of which parts disclosing the identities of the members of the ADF who had some involvement in the Fire and/or the response to it have been redacted as has and some further sensitive material. This approach was taken after the ADF foreshadowed making claims of public interest immunity. As the identity of particular individuals (and other redacted material) is not relevant to the issues of the general inquiry under the Coroners Act those assisting me and the representatives of the ADF have worked together to enable the brief to be admitted with those redactions. Although not identified by name, a numbering system has been adopted that means that the particular members of the ADF are referred to consistently throughout the documents in the brief.
14. Counsel Assisting addressed the evidence contained in the tendered bundle and submits that I need not make findings beyond those going to the cause and origin of the fire. Likewise, Counsel Assisting submits, that there are no matters upon which it would be necessary or desirable for me to make any recommendations. The course of this inquiry, and the submissions made by Counsel Assisting have been adopted by the remaining parties— namely the Rural

Fire Service and the Australian Defence Force. For the reasons set out, I accept both those submissions.

The Marrangaroo Training Area

15. The Marrangaroo Training Area (MTA) consists of about 1,700 hectares of land, and is located about 3 km to the north-west of the township of Lithgow. Lithgow abuts the foothills on the western side of the Blue Mountains. Access to the site is by the main entrance on Reserve Road, which is a right turn from the Great Western Highway, approximately 4 km west of the Lithgow turn off.
16. To the east of the MTA lies the northern part of the Blue Mountains area. About 50 km to the east, is the beginning of the Sydney Basin, at Kurrajong and the Hawkesbury River. The MTA is completely contained within a perimeter cyclone fence, which is inspected regularly by a resident caretaker.
17. The land consists broadly of two types of terrain: cleared areas that are generally flat or undulating small hills, and heavily wooded areas.
18. Although the MTA has historically housed resident ADF units, visiting units and cadets now use the site as a training area and in 2013 training included explosive ordinance training. Activities conducted on the site include field craft and demolition training.
19. Demolition training occurs on two extant ranges on the site:
 - a. The External Range, which is located in the northwest of the site.
 - b. The Internal Range, which is located in the eastern part of the MTA. It is more centrally located within the MTA, and thus has a slightly larger "Range Danger Area", being an area of land or water, together with specified air space, within which danger to life, limb or property may

occur arising from the firing of specified ammunition.

20. Both ranges are located within, and are immediately adjacent to, areas of dry sclerophyll forests. This is a typically Australian vegetation type, with plants such as eucalypts, wattles and banksias which are closely associated with low soil fertility.
21. The Internal Range is triangular in shape, with sides of approximately 30-40 m. Single dirt roads give access to each.
22. Given the MTA's use as an Explosive Ordnance training, storage and maintenance area, unexploded ordnance (**UXO**) is present throughout the range areas, and perhaps in other areas. The location of any UXO is unmarked.
(Chief of the Defence Force Commission of Inquiry (COI) Report at [10], V1 Tab 37 pp 168-170)

Mitigation of bushfire risk on the MTA before October 2013

23. The Bushfire Management Plan 2011-2014 (the **2011 BMP**) which was in force for the MTA at the time of the State Mine Fire contained "considerable discussion" about the steps involved in hazard reduction (see Chapter 2). However, according to the COI Report, before October 2013 there had been no hazard reduction on the MTA for approximately 20 years.
24. The 2011 BMP also noted that fire trail maintenance was crucial to implementation of the plan. Again, however, only one fire trail had been upgraded in recent times before October 2013 (Fire Trail 30); and it had no relevance to fighting fires in the areas of MTA which were most likely to be vulnerable to fire (being at the opposite end of the MTA to the two ranges). Additionally, water tanks which the 2011 BMP recommended be procured had been delivered, but not installed. *(COI V1 Tab 37 pp195-196)*

25. In his export report Mr Woods, comments s that while the 2011 BMP provided some general guidance to address fuel management, and outlined a monitoring and auditing process, there did not appear to be any evidence of any enforcement or audit process to ensure that the objectives of the Plan were met. *(V6 Tab 155 at 2708)*
26. At the time of the State Mine Fire there was no agreed protocol between the ADF and the RFS for fighting fires within the MTA. Having regard to the presence of unexploded ordnance at the MTA, the Commission of Inquiry considered that Defence could not have relied on the RFS to provide anything more than advice on fighting fires, hazard reduction and fire trail management within the MTA.
27. Further, whilst the ADF was a member of the Lithgow Bush Fire Management Committee, as at the time of the Fire it had attended only two of the last 16 meetings.
28. Generally, the COI found that there was a history of poor communication between the Bushfire Management Committee and the local RFS on the one hand, and the ADF on the other. *(COI V 1 Tab 37 pp195-197)*

Background to the events of 16 October 2013

29. On 2 September 2013, Wing Commander [Defence 19], who was the Commanding Officer of the Defence Explosive Ordnance Training School (**DEOTS**), issued a Range Instruction for Exercise Marrangaroo, which was scheduled to run between 27 September and 20 October 2013. The Exercise was a component of an Explosive Ordnance Disposal (**EOD**) course being conducted by DEOTS, and was envisaged to include live-fire training on the ranges at MTA.
30. Due to the late delivery of the explosive ordnance, the three days of live-fire in the EOD were collapsed into a single day. Throughout the day on 14 October

2013, a number of series were conducted by DEOTS at the External Range, for instructional or assessment purposes.

31. However, at the conclusion of the training on 14 October 2013, there remained a number of explosive items that required disposal. Inquiries were made of both DEOTS, and Thales Australia (which provides explosive ordnance storage and distribution to the ADF) as to the possible return of 8 x 84mm High Explosive Anti-Tank (**HEAT**) rounds to the EO Storage Depot at Orchard Hills. Based on the responses received, on 15 October 2013, it was determined that the return of these items was not reasonably practicable and that they would be disposed of by demolition at the MTA the following day.
32. It is recognised within the ADF that in certain circumstances it is appropriate for surplus EO to be expended rather than returned to the depot. The COI Report concluded that the decision to dispose of the 8 x 84mm HEAT rounds by demolition was reasonable in the circumstances, noting that the rounds had passed their operational use and significant cost would have been involved in returning them to the depot.
33. Having made this decision on 15 October 2013, the possibilities of standing up the Internal Range to dispose of the HEAT rounds were considered. The Range Control Officer (**RCO**), Major [Defence 13], confirmed that on 15 October 2013, he was spoken to about the proposal to conduct the serial on the Internal Range on 16 October 2013. He advised that it was necessary to amend (by pen) the Permanent Range Demolitions Detail (**PRDD**) that had been raised for 14 October 2013.
34. Sergeant [Defence 3] also contacted Captain [Defence 12], the OIC of Operations Training at DEOTS, in relation to the EO, noting that he had not been able to secure support for return of the rounds and that it was possible to fire the rounds. (*see COI V1 Tab 37 pp 171-172, 181-182*)

Weather conditions on 16 October 2013

35. The weather conditions leading up to 16 October 2013 were drier and warmer than average, contributing to a higher risk of bushfire on the MTA. Data from the Bureau of Meteorology Mount Boyce station indicated that from midnight on 15 October 2013 up until about 3pm on 16 October 2013, the wind had been blowing essentially from the west, at an average speed of 25 km/hour with gusts of up to 40 km/hour.
36. At the time of the demolition serial, the temperature was 19.5°. As the Commission Report noted, although the temperature was not high, “of significance is the fact that relative humidity had dropped from 45 per cent at midnight to 20 per cent at the time of the serial. This meant that the chance of controlling a fire within MTA, if one were to occur, was reduced.”
37. The Commission of Inquiry found that the conditions on 16 October 2013 and the higher winds occurring in the Blue Mountains the following day were accurately predicted by the Bureau in the week prior to the fire; and these predictions were readily available on the Bureau’s website.
38. The Commission of Inquiry also found that there was no indication that the Bureau’s predictions were taken into account by anyone directly involved in the serials on 16 October 2013, or by any Defence member, employee or contractor. Nor was there any indication that anyone connected with the management of the MTA or with the EOD course had any reference to the longer term seasonal weather prediction for the MTA.
39. The Commission of Inquiry found that while there were sections of the Range Standing Orders (RSO) which sought to have weather conditions taken into account in determining whether to proceed with a live fire serial, those sections were inadequate to achieve that aim (*COI Report V1 Tab 37 pp 189, 199-200*).

Fire Danger Rating

40. The fire danger rating, or FDR, for 16 October 2013 was “High” (V6 Tab 135). As explained in the Commission of Inquiry Report, fire danger ratings involve an assessment of the potential fire behaviour, the difficulty of suppressing a fire, and the potential impact on the community should a bushfire occur on a given day. It is determined by the Fire Danger Index, which is itself a combination of air temperature, relative humidity, wind speed and drought. (*COI Report at [171], V1 Tab 37 p 201*).
41. The Commission of Inquiry noted two features of the MTA which gave rise to the fire danger rating being a crude and inexact indication of the true bushfire risk at the MTA (*COI Report at [175], V1 Tab 37 p 201*):
- (i) The ranges in MTA are well within forests, and an assessment of fire danger rating which assumes a large component of grasslands (as is the case in the Central Ranges District) has the potential to underestimate the fire danger on MTA ranges.
 - (ii) The location of the MTA is at the border of the Central Ranges District and the Greater Sydney Region.

Detonation of the Explosive Ordnance, 16 October 2013

42. On the morning of 16 October 2013, at 9.26am, Sergeant [Defence 3] forwarded the amended PRDD to Captain [Defence 12]. He, in turn, sent an email to his superior, Wing Commander [Defence 19], seeking approval to sign the form. That approval was given at 9.33am. (*COI Report at [95]-[96], V1 Tab 37 p 184*)
43. At 9.49am, Captain [Defence 12] sent the email to Warrant Officer 2 [Defence 23], attaching the signed PRDD and noting that he had been authorised to sign it

on behalf of Wing Commander [Defence 19]. Warrant Officer 2 [Defence 23] showed the form to Major [Defence 13], and he gave his approval at 10.01am. (*COI Report at [96]-[97], V1 Tab 37 p 184*)

44. For the detonation of the demolition serial, Warrant Officer 2 [Defence 2] was the Officer in Charge Practice, Sergeant [Defence 3] was the Safety Officer, and Sergeant [Defence 4] was charged with constructing the serial. (*COI Report at [104], V1 Tab 37 p 185*)

45. According to Sergeant [Defence 4], he took from the storage point at the MTA sheet explosive, the 8 HEAT rounds, 4 metres of detonating cord and two electrical detonators. (*COI Report at [108], V1 Tab 37 p 185*)

46. Sergeant [Defence 4] proceeded with Warrant Officer 2 [Defence 2] and Sergeant [Defence 3] to the Internal Range, selected two existing craters for the detonation site and constructed two stacks for detonation (*COI Report at [109], V1 Tab 37 p 186*). He then made his way back to the sentry point. Sergeant [Defence 3] also moved to the sentry point and Warrant Officer 2 [Defence 2] returned to the Control Centre to complete a head count of students and staff. (*COI Report at [109], V1 Tab 37 p 186*) Sergeant [Defence 3] detonated the first stack by transmitter at 11.56am, and the second stack at 11.57am.

The Start of the Fire

47. As Safety Officer, it was the task of Sergeant [Defence 3] to move forward and clear the range. After waiting the requisite time, he proceeded on foot down range and proceeded to clear the area by visual observation for dangerous items.

48. After about 2-3 minutes of conducting those observations, Sergeant [Defence 3] heard a crackling sound. Looking to the edge of the range, he saw smoke coming from thick vegetation about 15-20 metres outside the range boundary.
49. Sergeant [Defence 3] approached the boundary and observed a small fire. When he first saw it, it was about 1 metre in diameter. He contacted Sergeant [Defence 4] by radio, advising of the fire and asking him to call for the Stryker Unit.
50. Sergeant [Defence 3] was not equipped with firefighting equipment, nor protective clothing. Because of the topography of the area, he was not able to contact the administration area directly, but had to relay the request for the Stryker Unit through Sergeant [Defence 4].
51. The Stryker Unit consisted of a Hilux ute with a 600 litre water tank, pump and hose on the back. The Stryker Unit was not at the checkpoint, Warrant Officer 2 [Defence 2] having taken the vehicle back to the administration area. This resulted in a longer response time, it taking between five and ten minutes for the Stryker Unit to arrive.
52. By the time the Stryker Unit arrived, the fire was about the size of a backyard swimming pool. The COI Report did not find that the presence of the Stryker Unit at the checkpoint would have permitted the fire to be extinguished before spreading, but noted that it could be the case that if there were any chance or controlling the fire at an early stage, it was lost before the Stryker Unit arrived at the Internal Range.
53. In any event, the COI Report found that the Stryker Unit was not capable of providing an effective response, because of its limited ability to gain access to the fire-ground, to project a large volume of water, and to transport a large quantity of water.

54. Sergeant [Defence 3] was joined at the range by Sergeant [Defence 4], Warrant Officer 2 [Defence 2], and two Visiting Assessors. The caretaker also attended, having contacted the RFS (although it appears the RFS had already been informed about the smoke by a non-military caller). The ADF members attempted to extinguish the fire using the available materials, which included the Stryker unit, shovels, a knapsack and their booted feet.
55. After a short time, and while the ADF members were in the vicinity of the fire just off the cleared range area, UXO was heard to explode. Warrant Officer 2 [Defence 2] considered the UXO was about 10 metres away, with a piece of shrapnel moving past his head and striking a tree 2-3 metres away from him.
56. Shortly after this occurred, Warrant Officer 2 [Defence 2] decided that the area was too dangerous to remain in, and that they should all withdraw to the administration area. The COI Report concluded in this regard that this was appropriate; it further noted that the presence of UXO in the immediate vicinity of the Internal Range, and its susceptibility to ignition by a bushfire, even in its early stages, rendered it unsafe for traditional firefighting methods to be employed in close proximity to any fire in the vicinity of the MTA. (*COI Report at [120-128], V1 Tab 37 p 189-191*)
57. According to the Section 44 Report that was prepared by the RFS Incident Controller for the State Mine Fire (*V3 Tab 96*), the fire was reported to the RFS at around 12.19pm. Initially two brigades were dispatched to the MTA, followed by an additional two brigades due to a number of follow up calls (*V3 Tab 96 p 1602*). After being informed that the ADF personnel had pulled out because it was too dangerous, all brigades were sent to the area of State Mine Gully, and reported that the fire was moving quickly and that spot fires were occurring outside of the MTA area (*p 1602*).

58. In his investigation of the Fire, RFS Investigator Wicks did not find any evidence of the following: lightning, campfire, smoking, debris burning, equipment use, Juvenile (fire play), rail lines or power line fault (*Vol 3 Tab 78 p 1272*).
59. It is without difficulty that I conclude that it was the demolition serial conducted on the MTA Internal Range to dispose of eight surplus 84 mm High Explosive Anti Tank rounds around midday on 16 October 2013 that caused the State Mine Fire. As is apparent from the material in the brief of evidence, once the fire started, the spread of the fire was difficult to prevent given the prevailing conditions on 16 and 17 October 2013. According to Mr Woods, the State Mine Fire was likely burning under Extreme and possibly Catastrophic Fire Danger Rating on 17 October 2013 (*Report V6 Tab 155 p 2721*).

Spread of the Fire

60. According to the Section 44 Report, the State Mine Fire was managed from the NSW RFS Lithgow District, by a multi-agency Incident Management Team (IMT), and an RFS Incident Controller was appointed (*V3 Tab 96 p 1603*).
61. Resources used to combat the State Mine Fire included fire-fighters from the RFS, Fire Rescue NSW, National Parks & Wildlife, Forest Corporation, County Fire Authority Victoria, Tasmanian Fire Service and Lithgow City Council (*V3 Tab 96 p 1604*).
62. By the time the first infrared line-scan was taken by the RFS, at 1.55pm on 16 October 2013, the fire had crossed the boundary of the MTA. However, it appeared to have only just passed out of Defence land.
63. Having regard in particular to the predicted winds of 90-95 km/h from the North West, a declaration under s 44 of the New South Wales Rural Fires Act 1997 (NSW) was made by the NSW Rural Fire Service Commissioner for the entire Lithgow Local Government Area on 16 October 2013 taking effect at 4pm. The declaration was amended the following day to include part of the Blue

Mountains Local Government Area and on 18 October 2013 to include also part of the Hawkesbury Local Government Area. The declaration was not terminated until 11 November 2013.

64. In detailing the findings of his investigation, RFS Investigator Wicks stated that the Fire travelled in a northerly direction and then to the east due to the prevailing winds, which impacted Marrangaroo to the west, Mountain Lagoon to the east, Mount York to the south and Bungleboori Creek to the North. He considered that the Fire was fuelled by heavy vegetation, while suppression efforts were hampered by the terrain and the risk of injury as a result of UXO. (*Vol 3 Tab 78 p 1272*)

65. In his report, Mr Woods considered that the rapid rate of spread and the high intensity of the State Mine Fire was evident in the reports of the incident (*Vol 6 Tab 155 p 2719*). The Section 44 Incident Controller's Report (*Vol 3 Tab 96 p 1607*) stated that shortly after the fire ignited, suppression efforts were unsuccessful due to the terrain, dry fuel conditions and weather, which influenced the fire behaviour under the influence of a strengthening northwesterly wind.

66. According to Deputy Commissioner Rob Rogers AFSM, firefighting efforts on the afternoon of 16 October 2013 were largely successful in containing the flanks of the blaze. However, conditions worsened significantly on 17 October 2013, with severe fire weather, high temperatures and wind gusts of up to 95 km/hour. On that day, the fire travelled more than 30 km in 24 hours. (*Vol 3 Tab 84 p 1322-1 to 1322-2*). Mr Woods refers in his report to the intensity of the fire on that day as being represented in the Line Scans on Day 2 (*Vol 6 Tab 155 p 2719*).

67. Ultimately, the State Mine Fire burnt an area of 54,862 ha, covering a perimeter of 461 km. (*Vol 3 Tab 84 p 1322-2*) It was not declared out until 11 November 2013 (*Vol 4 Tab 96 p 1623*).

68. According to the Section 44 Report, the Fire destroyed “six residential properties, three industrial buildings, one commercial building, and fourteen outbuildings” (*Vol 4 Tab 96 p 1603*). The assets which were damaged or destroyed included the following (*Summary in statement of the OIC, V1 Tab 2 p 24-42*):

- (i) At 157 Bells Road, Lithgow, six industrial units owned by Mr Ross Mumby. Mr Mumby had owned the units for six years. (*Mumby Statement: V6 Tab 142*)
- (ii) At the same address, a business conducted by Mr Daniel Galea in Unit 6 of the industrial units owned by Mr Mumby. The business was named Aelag Refrigeration, and comprised an office and showroom area. (*Galea Statement: V6 Tab 143*).
- (iii) At Scenic Hill, Lithgow, the premises of the Lithgow Valley Pistol Club. The Club had three buildings which were best described as sheds, all of which were destroyed. A hardwood fence spanning 25 metres was also damaged. (*Statement of Kevin Kirby: Pistol Club Captain, V6 Tab 144*)
- (iv) At Lot 54 Sandham Road Newnes, a cottage was were destroyed. The property was owned by Mr David McConnell.
- (v) At Lot 55 Sandham Road Newnes, another cottage was destroyed. Mr McConnell also owned Lot 55, which was tenanted at the time by Mr Greg Cohen. Two cars owned by Mr Cohen were also damaged. (*Statement of David McConnell, V6 Tab 146; Statement of Greg Cohen, V6 Tab 147*).
- (vi) At Bells Road, Lithgow, the maintenance premises for the Zig Zag Railway was destroyed. The premises contained machinery for the maintenance of rolling stock, various steam and diesel locomotives and a carpentry

workshop, along with the caretaker's carriage and another freight and passenger carriage. (*Statement of Michael Forbes, CEO of Zig Zag Railway Co Op Limited, V6 Tab 141*)

69. On 17 October 2013, bushfires also ignited at Springwood and Mount Victoria.

There is no suggestion that the State Mine Fire sparked or was in any way causative of or connected to those fires.

70. As part of his report, Mr Woods was asked to address whether the emergency notification warnings to residents were adequate and reasonable (*V6 Tab 155 p 2718*). Mr Woods noted that Community Meetings and Warning Messages, updates on the NSW RFS Website, the "Fires Near Me" smartphone app, Emergency Services social media platforms, and organised Media Briefings, provide a number of opportunities to keep the public informed of rapidly changing and serious bushfire events. The accuracy and timely management of these pathways rely on valid and well-timed information from and concerning the incident scene and predictions of movement of the fire, which can be a challenge in relation to remote and fast-changing events (*p 2718*).

71. Mr Woods considered that the appointment of a Media Officer within the Incident Management Team within the first three hours of the fire was appropriate. However, on Day 3 of the event the Media Officer was redeployed, which required the Incident and Deputy Incident Controllers to fulfil the role. Mr Woods considered that these officers were suitably experienced and trained to effectively undertake the role. However, he noted that the Incident Controller had recommended in his report that a dedicated Media Officer should be maintained in future events. Mr Woods agreed with this recommendation but noted that during periods of activity, resources may from time to time be depleted and may preclude the allocation of a Media Officer at every incident (*Vol 6 Tab 155 p 2719*).

72. Mr Woods considered that the initiation of Public Meetings when communities were identified to be at risk was a valid strategy (*Vol 6 Tab 155 p 2719*). He also referred to the activation of “Emergency Alerts” and “Emergency Warnings” in a number of instances as a good example of pre-empting fire impact and providing advice to the community during a fast moving and rapidly changing fire situation (*Vol 6 Tab 155 p 2720*). In response to Mr Woods’ report in this regard, the RFS noted that in May 2017 it issued an updated Operational Protocol 1.1.5, dealing with Warnings and Publications, to further enhance how the RFS prepares for and engages with the community during emergencies (*V3 Tab 82*).

73. In correspondence with the then State Coroner, the Mount Wilson/Mount Irvine Rural Fire Brigade identified a number concerns in relation to the State Mine Fire, in particular the lack of warning and advice of the movement of the Fire into their area. I will address those matters below. For present purposes, however, I note that Mr Woods considered it important that the provision of timely and accurate advice, including to the Mount Wilson/Mount Irvine Rural Fire Brigade, needed to be placed in the context of a developing situation involving three fires, where the fire prediction and available intelligence did not indicate that the Mount Wilson area would be impacted for a few days. In those circumstances, the RFS prioritised community meetings in areas that were predicted to be more imminently impacted. (*Vol 6 Tab 155 p 2720*)

ADF directives regarding conduct of live-fire exercises and bushfire prevention at the time of the State Mine Fire

74. According to the Commission of Inquiry Report, the evidence before the Commission “revealed a rather convoluted and complex set of administrative, environmental, certification, maintenance and other management arrangements, including orders and arrangements relating to the use of the MTA as a training facility (*COI Report at [177], V1 Tab 37 p 202*).

75. The primary orders regulating activities on the MTA are the Defence Training Area Management Manual (**DTAMM**) and the Range Standing Orders (**RSO**). The Commission of Inquiry found that although there were a number of ambiguities and inconsistencies within both Defence Training Area Management Manual and the Range Standing Orders in relation to bushfire prevention and live-fire restrictions, both on the MTA and generally, it was clear that live-fire activities were prohibited on the MTA when the fire danger rating is HIGH and above (*COI Report at [206], V1 Tab 37 at 207*)

76. In relation to the Defence Training Area Management Manual, the Commission of Inquiry considered that there was a degree of ambiguity as to the circumstances in which live-fire activities are permitted on Defence Training Areas (*COI Report at [235], V1 Tab 37 at 212*). However, paragraph 7.1 of the DTAMM stated:

“The commencement or continuation of live-fire activities during periods declared by State or Territory authorities as ‘high’ to ‘extreme’ or ‘catastrophic’ (or however described) fire danger may pose unacceptable levels of risk...It is Defence policy that live-fire activities in such periods are not to be permitted unless there is an authorised operational imperative. The requirements of seeking any waiver consideration are detailed in the following paragraphs”.

77. The Commission of Inquiry considered that on a plain reading of this paragraph, there could be no live-fire activities conducted on Defence Training Areas at FDR HIGH or above without a waiver, or at least an “authorised operational imperative” (*COI Report at [242], V1 Tab 37 at 213*). In so far as there was any confusion or ambiguity in September or October 2013, the Commission of Inquiry found that specific guidance should have been sought on the issue. (*COI Report at [243], V1 Tab 37 at 213*)

78. In relation to the Range Standing Orders:

- a. Range Standing Order 10.9 stated that “live-firing of any type...are not permitted in MTA when the fire danger index is High or above” (the COI noting that the reference to “fire danger index” was an error on the part of the drafter: *COI Report at [211-212], V1 Tab 37 at 207*. (That is, index was used when the term rating was meant).
- b. RSO 14.18(c) repeated the prohibition (*COI Report at [214], V1 Tab 37 at 208*).

79. The Commission of Inquiry concluded that on the basis of the RSO, the serial which directly led to the resulting bushfire should not have taken place (*COI Report at [206], V1 Tab 37 at 207*).

80. The Commission of Inquiry noted, however, that on 11 September 2013, an email had been sent purportedly, unilaterally, approving an amendment of Range Standing Order 10.9 so as to replace references to a “HIGH” fire danger rating with instead a reference to a “VERY HIGH” fire danger rating (*COI Report at [2], V1 Tab 37 at 209-210*). The purported amendment was made following changes which were made to the generic fire danger rating scale in use, the effect of which appeared to have been misunderstood.

81. The Commission of Inquiry found that those conducting the serial on 16 October 2013 had understood that the serial was permitted because the Fire Danger Rating was HIGH on 16 October 2013 (and not VERY HIGH). If it was not for the email purporting to amend the Range Standing Orders, the serial would not have proceeded. (*COI Report at [252], V1 Tab 37 at 214*)

82. As for the 2011-2014 BMP, Table 4-1 in the 2011-2014 BMP contained an instruction that “live firing activities and the use of open fires is prohibited” when the FDR was “VERY HIGH”. However, it also provided that “[a]ctivities must be consistent with Standing Orders” and thus imported RSO 10.9 and 14.8. (*COI Report at [231]-[232], V1 Tab 37 at 211*).

Response to the Fire

The ADF

83. The ADF has provided a statement from Colonel David Graham, who is the Director of Operations and Training Area Management (**DOTAM**). Colonel Graham's responsibilities include the operation and coordination of the management of the managed training areas across Australia; and, in that capacity, coordinating EI&G's implementation of the recommendations of the COI (*V1 Tab 38 at [1]-[2] p 225*).
84. According to Colonel Graham, after the COI Report was released on 31 January 2014, the ADF "undertook to develop and implement a wide range of responsive reforms, particularly with respect to the way it manages the risk of fire" (*V1 Tab 38 at [8] p 225*). The response to the COI Report included the formation of the Marrangaroo Stakeholder Group, which was chaired by the Director-General of Select Strategic Issues Management, the purpose of which was to ensure the implementation of the Commission of Inquiry's recommendations, where applicable, across the Defence Estate, including in respect of reviewing documents to remove ambiguity and inconsistencies for all Defence ranges (*Vol 1 Tab 38, p 228-229 [16]*).
85. Colonel Graham identified the changes as occurring in a number of key areas (*V1 Tab 38 p 226-227*).

Defence Operating Procedures and Management Plans

86. The operating procedures and management plans for the Defence estate, including at the MTA, have been reviewed and amended, in particular with respect to:
- a. bushfire risk mitigation;
 - b. Fire Danger Rating (FDR) thresholds for the conduct of live fire activities; and

- c. the accuracy of accounting practices for the use of explosive ordnance

Bushfire Management Plans

87. According to Colonel Graham, the Defence Bushfire Policy (**the Policy**) was finalised and published in August 2015 (*Vol 1, Tab 38, p 229 [19]*). All BMPs must now be prepared in accordance with the requirements under the Policy, which includes fire prevention measures. The Policy also requires that BMPs for sites on which live-fire activities occur must include a fire prevention and response plan in accordance with the Defence National Guidelines for Bushfire Management and Mitigation. (*Vol 1, Tab 38, p 230 [22]*)

88. There is also, according to Colonel Graham, a close interface between bushfire management and the management of UXO, with any mitigation activities having to be risk-assessed against UXO risks and conducted according to that risk (*Vol 1, Tab 38, p 229 [21]*).

89. In relation to the MTA, Colonel Graham stated that the BMP had been revised by January 2015 to include an outline of a bush fire preparedness accountability framework (*Vol 1, Tab 38, p 230 [25]*). Consistently with the Policy, it is divided into sections addressing topics that include environmental risks of the MTA, access, Defence activities and relevant fire rating thresholds (*Vol 1, Tab 38, p 231 [27]*):

- a. Section 1 outlines risk assessment and management strategies for the MTA. The two key risk mitigation measures to be implemented are (*Vol 1, Tab 38, p 231 [28]*)
 - i. reducing the potential for a fire to start during maintenance, training and disposal activities; and
 - ii. reducing the intensity of an ignition and the potential for it to leave the site by undertaking prescribed burning and maintaining a fire trail network.

- b. Section 2 establishes a mitigation works program, the aim of which is to reduce the potential for fires to start and spread within, into and from the MTA, and mitigating the potential damage fires may cause. As Colonel Graham observed, there is an integrated risk strategy that involves (*Vol 1, Tab 38, p 232 [33]*):
- i. maintaining a network of roads and fire trails within the site;
 - ii. maintaining a strategic fire break along the eastern boundary and fuel reduced zones within the external and internal destruction areas;
 - iii. conducting a strategic regular program of fuel reduced zones over the period of the MTA BMP; and
 - iv. maintaining low fuels around the Administration Area and other built facilities.
- c. Section 3 establishes and makes provision for a bushfire awareness program (*Vol 1, Tab 38, p 233 [35]*).
- d. Section 4 sets out a preparedness and response strategy for ADF personnel, and includes the minimum fire suppression equipment that should be supplied by any unit using the MTA (*Vol 1, Tab 38, p 233 36]*).

90. The MTA BMP also includes a Review Schedule which ensures that the BMP is reviewed regularly, and has a timetable and checklist for annual reviews to be undertaken (*Vol 1, Tab 38, p 231 [26]*).

91. In relation to live firing activity, the BMP stipulates that all live firing activities or activities with ammunition natures with the potential to cause ignition are prohibited, unless a waiver has been issued.

Directives regarding live-firing activities

92. In his statement, Colonel Graham stated that amendments have been made to the Defence Training Area Management Manual, the Explosive Ordnance Disposal Range Orders and the Marrangaroo range standing orders, to minimise bushfire risk during live firing activities (*Vol 1, Tab 38, p 235 [42]*).

93. A revised Chapter 7 of the Defence Training Area Management Manual, which outlines the processes for the control of live-fire activities on Defence training areas, was published in August 2015 (*Vol 1, Tab 38, p 229 [19]*). The revised chapter includes a prohibition on the conduct of live fire activities in the event of a total fire ban, absent obtaining a waiver, and makes provision for the obtaining of any such waiver (*Vol 1, Tab 38, p 235 [44]*).
94. Under the revised Explosive Ordnance Disposal Range Orders, live firing can only be conducted on a total fire ban day if a waiver has been granted at a two star level, in accordance with Chapter 7 of the Defence Training Area Management Manual. If there is not a total fire ban, live firing at MTA is not permitted where the fire danger rating for the Central Ranges District or Greater Sydney Region is HIGH or above. Additionally, the Range Control Officer and/or the OIC Practice have the authority to suspend a live fire activity if they consider there is an unacceptable risk of wildfire or bushfire (*Vol x, Tab 38, p 237 [46]*).
95. The Marrangaroo Range Standing Orders have been amended to include provisions that restrict activities during a fire. During a bushfire season, the range standing orders now mandate, inter alia, consultation with the Bureau of Meteorology website, and with NSW RFS in advance of activities; and the presence of a fire fighting appliance at the nearest safe location to the range.

Memorandum of Understanding between the RFS and the ADF.

96. The range standing orders also impose a restriction on live firing activities. Mr Woods was specifically asked whether the hazard reduction strategies and fuel management plans now in place were adequate and reasonable for the Marrangaroo Army Base and whether there were now sufficient strategies in place to check, on a routine basis, that the ADF is complying with the current BMP for the Marrangaroo Army Base.

97. Mr Woods reviewed the updated BMP, policies and procedure documents and stated that, in his opinion, the hazard reduction strategies and fuel management plans now in place are adequate and reasonable for the Marrangaroo Army Base (MAB). He also states that there are now sufficient strategies in place for the ADF to comply with the BMP on the MAB.

98. Mr Woods considers that a greater emphasis has now been given to monitoring and reporting of programs within the BMP, allowing for an improved ability to enforce activities to be completed (*Vol 6 Tab 155 p 2712*). He also expresses the view that there has been significant effort in reviewing the Standing Orders and the governance around the use of live ammunition on the MTA during the bushfire period. Considered in combination with the Memorandum of Understanding, to which I will refer below, Mr Woods considered that the strategies on the MTA for approvals and checks before live ammunition training on HIGH fire danger rating days are adequate and reasonable (*Vol 6 Tab 155 p 2715*)

Training

99. Colonel Graham refers in his statement to the training that has been provided to Defence personnel with respect to explosive ordnance accounting procedure and fire behaviour. In relation to the latter, he observes that a Training Course was provided to Range Control staff for the 2014/2015 fire season, involving the fundamentals of fire behaviour and responding to a potential outbreak of fire (*Vol x Tab 38 p 242 [61]*). This training was to be provided on an ongoing annual basis to new range control staff.

Liaison with the Bureau of Meteorology

100. The ADF has also developed a Fire Forecasting Service with the Bureau and contracted with the Bureau for the provision of automatic weather stations (**AWS**) at training areas with higher fire risk profiles, including the MTA.

Liaison with RFS

101. The ADF has liaised extensively with the NSW RFS, including with respect to developing and implementing a Memorandum of Understanding between the agencies which will provide a framework to facilitate communication and leverage NSW RFS expertise and manpower to assist the ADF with bushfire planning and risk mitigation.
102. According to Colonel Graham, the work that has been done as between the ADF and NSW RFS has included the establishment of a working group between Defence Support Northern NSW and the NSW RFS (**Joint Working Group**), to investigate the issues surrounding the MTA and to develop and implement a Memorandum of Understanding (**MOU**) (*Vol x Tab 38 p 244 [74]- [75]*). The current MOU is dated 6 November 2017 and is included in the brief at Tab 68 (p 1215).
103. In January 2015, the Deputy Secretary of Defence Estate and Infrastructure Group confirmed that Defence had undertaken a review of its ability to respond to a fire within the MTA, in consultation with the RFS. According to Colonel Graham, the fire-fighting measures which were implemented, namely, the execution of the works recommended in the revised BMP, revision of the Marrangaroo range standing orders, and provision of a fire tender with a crew, were based on consultations with the RFS and upon the ADF's views as to the particular circumstances of the MTA (*Vol 1 Tab 38 p 245 [84]*).
104. The MOU that has been developed provides a framework to facilitate communication and establish protocols as between the Department of Defence and the RFS. According to the current MOU, its purpose is to provide a framework for (*Vol 3 Tab 68 p 1217 [12]*):
- a. Interagency interactions in jointly managing bushfire risk on Defence land in NSW

- b. Defence support for NSW RFS bushfire fighting operations; and
- c. Ensuring mutual organisational readiness for emergency bushfire response.

105. In addition to the MOU, a Mutual Aid Agreement (**MAA**) has been executed in relation to the MTA (**MAA**) (*Vol 3 Tab 69 p 1247*). The MAA covers the MTA, and is specifically between the MTA and the NSW RFS Chifley/Lithgow Team (*p 1248*). The aim of the Mutual Aid Agreement is to document the local cooperative framework and agreed commitments between Defence and the RFS in relation to the management of bushfires and bushfire hazard mitigation activities for fires within or threatening the MTA (*p 1248*).

106. According to Colonel Graham, the RFS and the ADF have continued liaise to ensure that bushfires that ignite in the future are successfully managed and suppressed.

107. In his report, Mr Woods observed that the MOU and the Mutual Aid Agreement had identified the key action to ensure that fires on the MTA are responded to in a timely manner (*Vol 6 Tab 155 p 2717*). Mr Woods further observed that the ADF had committed to representatives from the MTA to attend meetings of the Lithgow District Bushfire Management Committee, noting that attendance before the State Mine Fire had been irregular. In Mr Woods' opinion, this would provide an opportunity for operational integration with the RFS at a risk management level along with other Lithgow-based emergency services represented on the Committee (*Vol 6 Tab 155 p 2718*).

Purchase of equipment and amended response procedures

108. The ADF has enhanced its fire-fighting capacity at the MTA, including through an upgraded fire-fighting appliance and crew and other fire-fighting equipment.

109. Colonel Graham noted in his statement that in October 2014, the Deputy Secretary of the Defence Estate and Infrastructure Group confirmed that the contractor for the MTA was to provide an upgraded fire-fighting appliance and crew for the MTA.
110. The Marrangaroo Commission of Inquiry team consulted with the NSW RFS in this regard. The RFS recommended a Category 7 fire fighting vehicle (light tanker with a water capacity of 800-1600L) (*Vol 1 Tab 38 p 246 [90]*). However, the Defence Estate and Infrastructure Group decided that a Category 9 Stryker vehicle would be appropriate, which is a Toyota Landcruiser-type vehicle with an integrated fire-fighting appliance and a water capacity of 500-600L (*Vol 1 Tab 38 p 247 [91]*).
111. The Defence Estate and Infrastructure Group made this decision, after consulting with the RFS on the basis that a significant part of the MTA had burnt during the State Mine Fire, and a hazard reduction burn had been conducted in the unburnt area since that time (*Vol 1 Tab 38 p 246 [91]*). The vehicle has since been upgraded with the provision of a longer hose allowing crew to fight more effectively (*Vol 1 Tab 38 p 247 [92]*).
112. In addition to the equipment, Colonel Graham notes that Chapter 10 of the Marrangaroo Range Standing orders have been amended to provide for more extensive fire response actions than had previously been in place (*Vol 1 Tab 38 p 247-248 [94]-[96]*). The Marrangaroo BMP also makes provision for the user unit exercising within the MTA to provide a Category 9 vehicle, with the provision of such a vehicle forming part of the Base Services Contract for the MTA (*Vol 1 Tab 38 p 247 [98]; extracts of Base Services Contract at V2 Tab 59*).
113. In his report, Mr Woods considers that the engineered fire management and response arrangements are adequate and reasonable for the MTA. Although it was not evident from Colonel Graham's statement, or the documents, what level of firefighting was given to employees of the firefighting contractor or to ADF

personnel attached to the MTA, Mr Woods suggests that the qualifications and skills maintenance given to those officers should meet the nationally recognised qualifications for bushfire suppression or their equivalent (*Vol 6, Tab 155 p 2716*).

114. In disagreeing with the response to this recommendation in Mr Woods' report, Defence advanced the following matters (*Vol 3 Tab 61 p 1084*):

- a. It is not a fire fighting agency.
- b. The State of NSW is responsible for the provision of fire services on Commonwealth land pursuant to an MOU between the Commonwealth, as represented by the Department of Finance, and the States and Territories (**Fire Services MOU** (*Vol 3 Tab 67*)).
- c. The MTA has a low risk profile in terms of the likelihood of a fire resulting from Defence practice, as evidenced by there being only two reported fires on the range, which stems in part from its infrequent use.

115. Defence further noted that bushfire management and response training is provided to personnel who attend the MTA, including so as to provide them with an understanding of how to identify fire risks and correspond with fire response authorities. Accordingly, any recommendation in this regard is neither necessary nor desirable.

Mapping

116. Colonel Graham refers in his statement to a map having been provided to the RFS which shows the likelihood of the presence of unexploded ordnance at the MTA (*Vol 1 Tab 38 p 251 [106]-[108]*).

117. Defence also engaged with a contractor to establish a national program to map and produce risk assessments for unexploded ordnance on all training ranges (*Vol 1 Tab 38 p 251 [109]-[110]*).

Hazard Reduction

118. A series of hazard reduction activities were undertaken at the MTA in liaison with the NSW RFS in preparation for the 2014/2015 bushfire danger period (*Vol 1 Tab 38 p 252 [112]ff*). According to the ADF, those activities have continued, in accordance with the revised BMP for the MTA and the Defence Bushfire Policy (to which reference is made below) (*V3 Tab 61 p 1090*).
119. According to Colonel Graham, the Base Services contractor is responsible for undertaking environmental restoration tasks and is expected to be proactive in this area. Before the commencement of each bushfire season, the contractor is required to complete a number of bushfire mitigation tasks, in accordance with the BMP, including to maintain water supplies for fire-fighting, to update fire signs daily during the fire season and conduct fuel load assessments (*Vol 1 Tab 38 p 252 [114]*).
120. The contractor is also responsible for (*Vol 1 Tab 38 p 253 [115]*):
- a. coordinating hazard reduction burning and buffer burning, in collaboration with the Rescue and Fire-fighting contractor, the RFS and the local Defence fire fighters;
 - b. clearing and maintaining a fire break along the inside of each perimeter fence, in accordance with the MTA;
 - c. keeping fence lines clear of grass, shrub and tree growth; and
 - d. maintaining the surrounds of utility meters, power poles, and power lines, to ensure they are free of vegetation.
121. Specifically in relation to the MTA, the contractor is required to conduct firebreak maintenance on the east fence line of the MTA range which contains the boundary examination track (*Vol 1 Tab 38 p 253 [115]*). The ADF has confirmed (by letter of 6 August 2018) that various bushfire mitigation works have been carried out for seasonal bushfire danger periods since the State Mine Fire including by way of annual inspections, maintenance of Asset Protection Zones and by adopting a schedule for the planning and delivery of hazard reduction works (*Vol 3 Tab 61 p 1090*).

122. In his report, Mr Woods states that, in his view, the hazard reduction strategies and fuel management strategies now in place comprehensively address the inadequacy of the situation as at October 2013 (*V6 Tab 155 at 2709*).

The Rural Fire Service

123. RFS confirmed that following the State Mine Fire, it undertook an “inclusive post incident consultation and debrief process” (*V3 Tab 80*). The process included consultation with key stakeholders such as NSW RFS volunteer and staff members, along with the local Bush Fire Management Committee, which comprises Defence, other emergency service agencies and private and government bodies. The process involved a number of separate activities, including after action reviews conducted by local brigades and a review of the

RFS review of the ADF Commission of Inquiry Report

124. In its Review of the findings of the COI Report, the RFS noted that there were six recommendations which were of interest to it, the focus of which was the purchase of equipment and liaison with the RFS in relation to mapping, hazard reduction and the weather parameters for live-firing exercises. These matters have been addressed, including in the MOU (*V3 Tab 80*).

Meeting with the Mount Wilson/Mount Irvine Rural Fire Brigade

125. As I have already noted, the Mount Wilson/Mount Irvine Brigade raised a number of issues, including communication of information and updates as between the Lithgow Incident Management Team and the Brigade, communications to and from the Blue Mountains Team, which was managing the other two fires, and the absence of a Talk Group channel being assigned when requested (one was allocated albeit with some delay) (*V3 Tab 82; V6 Tab 136-138*).

126. On 5 March 2019, a meeting was attended by representatives of the RFS and the Mount Wilson/Mount Irvine Brigade. As a consequence of that meeting, the

Mount Wilson/Mount Irvine Brigade notified those assisting me that all of the issues that they had raised had been resolved and that those resolutions had been included in an Agreed Action Plan between the RFS and the brigade which includes provision including for communication and community protection planning (V6 Tabs 154A and 154B pp 2703 - 2703-4).

Further recommendations of Mr Woods

127. In his report, Mr Woods made two additional recommendations:

- a. that Defence undertake an annual training exercise at the MTA, involving all local firefighting agencies, to reinforce the education and cooperative firefighting arrangements between MTA personnel and the RFS;
- b. that Defence research the use of unmanned aerial vehicle (**UAV**) technology in the management of bushfires at the MTA.

128. In its response to Mr Wood's Report (*V3 Tab 61*), Defence noted that there are currently three types of training exercise undertaken at the MTA to reinforce cooperative firefighting arrangements and site familiarisation, including tabletop training exercises, RFS training exercises, and familiarisation training. The cooperative training arrangements as between Defence and the RFS are reflected in the MAA (*V3 Tab 61 p 1083*).

129. As to the use of UAV technology, Defence stated in its response that it has researched and considered the use of UAV technology in the management of bushfires at the MTA, but did not currently intend itself to invest in it. The reasons for its decision in this regard include that Defence is not a firefighting agency; the MTA is a small training area where the utility of such technology may be limited and offer little advantage over direct observation; and the operation of UAV in the event of a bushfire is likely to complicate airspace management over the incident site (*V3 Tab 61 p 1086*).

130. In the light of these responses, any recommendation in this regard is either necessary or desirable.

Findings

131. I find that the State Mine Fire was caused on 16 October 2013 by a demolition serial conducted by ADF personnel at the Marrangaroo Training Area, that the fire spread extensively, in particular having regard to weather conditions over the period 16 – 17 October 2013, causing damage to property but no serious injury or loss of human life. Recommendations are neither necessary nor desirable having regard to the steps taken by the ADF, the RFS and local brigades.

Magistrate E Truscott
Deputy State Coroner
14 May 2019