

Independent Monitor –
Fiskville Report – July
2015

Table of Contents

Topic	Page
Introduction	2
Methodology	2
Independent Monitor Recommendations	3
Chronology of Events – Fiskville Investigation	4-6
CFA Response	6-8
Governance	7
Closure of Fiskville	7-8
Status of Recommendations and Initiatives	8-11
IFI Recommendations	8-9
Board Initiatives	9
Lawrence Report Recommendations	10-11
Recommendations from Cardno Lane Piper & 53V Audit Reports	11
EPA Clean Up Notice & Environmental Auditor (53V) Report	12-14
Fiskville Works	14-17
Health Initiatives	17-19
Health Surveillance Program	17-18
Monash Study	18-19
Appendices	
IFI Report Recommendations - Appendix “A”	20-24
CFA Board Initiatives - Appendix “B”	25-26
Lawrence Report Recommendations – Appendix “C”	27-40
Cardno Lane Piper & 53V Audit Recommendations – Appendix “D”	41-49

Introduction

In December 2011 and January 2012, the Herald Sun newspaper published a series of investigative reports raising serious concerns about the possible health impacts of training practices at the Country Fire Authority (CFA) Fiskville Training Centre dating from the 1970s. As a result of the first report, CFA commissioned an independent investigation into the use of materials and training practices at Fiskville. The investigation was chaired by Professor Robert Joy (*former Deputy Chairman of the Victorian Environment Protection Authority and Adjunct Professor at Royal Melbourne Institute of Technology*). Publication of the terms of reference for the investigation occurred on 14th December 2011.

The Independent Fiskville Investigation (IFI) Report was provided to the CFA by Professor Joy on 28th June 2012. The report detailed 10 recommendations to address the findings and conclusions of the report. The IFI Report included subordinate reports prepared by Golder & Associates and a report titled 'Review of CFA Regional Training Grounds' by Brian Lawrence (Lawrence Report). Each of these reports made additional recommendations which the Joy report recommended be addressed.

The IFI Report was considered by the CFA Board in June, 2012 and a "*Response to the Professor Joy Report of Independent Investigation into the CFA Facility at Fiskville*" document was released on 12th July 2012. In that document the CFA accepted the facts, conclusions and recommendations of the IFI Report and undertook to ensure that the recommendations would be addressed as a matter of priority. In addition, the Board identified a number of additional initiatives for action.

The Independent Monitor – Fiskville was appointed in February 2013 to monitor CFA's progress to implement the recommendations and the Board initiatives and report on progress to the Board. An Interim Report was published on the CFA website in July 2013.

Methodology

In undertaking the monitoring role, the Independent Monitor – Fiskville has reviewed evidence documents, including assessment reports, met with program and project managers, attended program and project workshops and conducted visits to Fiskville to view progress on the implementation and completion of recommendations and initiatives.

Independent Monitor Recommendations

The Independent Monitor – Fiskville makes the following recommendations relative to outstanding issues.

Recommendation 1:

That the Executive Director, Informing The Future Program, be responsible for the on-going monitoring and reporting of the outstanding IFI recommendation.

Recommendation 2:

That the Executive Director, Informing The Future Program, be responsible for the on-going monitoring and reporting of the implementation of ISO 14001 Environmental Management and AS4801 Occupational Health and Safety (Board Initiative 2).

Recommendation 3:

That the Executive Director, Informing The Future Program, be responsible for the on-going monitoring and reporting of the outstanding Lawrence Report recommendations.

Recommendation 4:

That the Executive Director, Informing The Future Program, be responsible for the on-going monitoring and reporting of the outstanding recommendations arising from the Cardno Lane Piper work and the 53V Audit Report.

Recommendation 5:

That the Executive Director, People and Volunteerism be responsible for the on-going Health Surveillance Program monitoring and reporting.

Chronology of Events – Fiskville Investigation

6 December 2011: Claims firefighters have been exposed to harmful chemicals used in practical firefighting drills between 1970's and 1990's revealed in the media

14 December 2011: CFA announces Professor Rob Joy to conduct an enquiry into past hot fire training practices and potential for contamination at Fiskville

December 2011: CFA establishes support services for anyone who believes they may have been affected by historical practices.

December 2011: Two hygienists report no significant risks to the health and safety of people working at the site and those attending the site either as trainees or visitors.

26 June 2012: CFA switches to town mains water for practical firefighting training.

28 June 2012: Professor Joy delivers '*Understanding the Past to Inform the Future*' report to CFA.

12 July 2012: CFA accepts all 10 Professor Joy recommendations and commits to 11 additional management initiatives.

July 2012: Leading Australian environmental engineering firm Cardno Lane Piper commences implementation of the recommendations.

August 2012: Program manager appointed with responsibility for managing the implementation of the 10 Professor Joy Recommendations and 11 management initiatives.

August 2012: Voluntary Health Surveillance program established.

October 2012: Worksafe issued a formal letter stating that it "*acknowledged the continued operation of the Fiskville Training Facility in accordance with the risk controls associated with dangerous goods and fire fighting water presented during inspector visits conducted since 6 December 2011*".

October 2012: CFA completed installation of two fully enclosed, above ground storage tanks to replace the previous open underground storage tank known as 'the Pit' to address concerns regarding run-off from the surrounding area, including dirt and clay particles entering 'the Pit' during rain events. The storage tanks are filled exclusively with town mains water.

3 December 2012: Line control of CFA training campus staff transferred to Executive Director Operational Training and Volunteerism.

Independent Monitor – Fiskville Report – July 2015

30 November 2012: Monash Centre for Occupational and Environmental Health engaged to investigate the cancer incidence and all causes of mortality among Fiskville Practical Area Drill (PAD) workers and instructors who operated the Fiskville Training Campus 1971-1999. The study was completed late 2014 and released early 2015.

December 2012: Environmental adviser appointed.

January 2013: EPA issues two clean up notices in respect of CFA's Fiskville State Training College each requiring an audit by an EPA-appointed Environmental Auditor.

January 2013: EPA-appointed Environmental Auditor engaged to conduct the two environmental audits as per the requirements of the two clean up notices.

February 2013: Former Victoria Police Deputy Chief Commissioner Kieran Walshe appointed Independent Monitor - Fiskville by CFA Board.

April 2013: EPA accepts CFA's current program of work to undertake environmental and human health risk assessments and upgrades to the site.

May 2013: Victorian Government announces \$16.8 million dollars in State budget for upgrades at CFAA training campuses, primarily Fiskville.

May 2013: Eminent toxicologist advises CFA some members may have eaten fish containing residues from firefighting foams from dams at Fiskville and recommends blood tests and health checks. Following review of blood tests and health checks, toxicologist advised risk is negligible.

July 2013: Independent Monitor – Fiskville releases interim report indicating good progress implementing recommendations and management initiatives.

January 2014: Fiskville Stage 1 engineering works commenced to divert creek around Lake Fiskville, enhance drainage systems from the Practical Area for Drills (PAD), establish wetland to filter storm water and install bunds to increase the capacity of the dams.

March 2014: Cardno Lane Piper completes their final Fiskville environmental and human health assessment reports.

11 April 2014: EPA-accredited Environmental Auditor completes the first of two audits of Fiskville and submits his report to EPA.

3 July 2014: Fiskville Stage 1 civil works completed.

7 July 2014: EPA releases the Environmental Auditor's report, along with all of Cardno Lane Piper's Fiskville assessment reports.

2 March 2015: Training operations at Fiskville were suspended temporarily following the detection of PFOS in a limited number of industrial training infrastructure outlets

Independent Monitor – Fiskville Report – July 2015

(pumps and hydrants) that supply water to the fire fighting training area. In order to confirm where PFOS was throughout the water supply further testing of all water outlets across the site commenced on 5 March 2015. This testing included water outlets for domestic use (taps, showers and toilets), mains water entering the site, hydrants used for training, and training water infrastructure such as pumps and tanks.

26 March 2015: Fiskville facility closed permanently following the confirmation of PFOS detections in almost all of the industrial training infrastructure outlets (pumps and hydrants) that supply water to the fire fighting training area and the unexpected detection of PFOS in a fire hose connection outlet located in the hangar, away from the main training area. Testing showed there was no PFOS in the mains water supply nor in the domestic water outlets.

CFA Response

CFA has demonstrated a commitment, and has been active in the implementation of the recommendations and initiatives contained within the reports addressed and reviewed by the Independent Monitor – Fiskville.

CFA responded swiftly to the IFI Report by appointing a Program Management Team, comprising a Program Manager and support staff to manage a program of activities and projects established to implement the IFI recommendations and Board initiatives under the banner of the “Informing the Future” Program. Implementation of the recommendations arising from the Lawrence report was assigned to CFA’s Operational Training and Volunteerism Directorate.

In July 2012 CFA engaged Cardno Lane Piper to undertake assessments and to prepare reports relevant to works and remediation required at Fiskville and CFA’s six Regional Training Grounds. Cardno Lane Piper possessed the required knowledge and expertise to enable progression of the IFI recommendations.

By February 2013 the results of Cardno Lane Piper’s environmental assessments at Fiskville were available and CFA was briefed on the findings, however the work was subject to an environmental audit that was a requirement of clean up notices issued by EPA on 22 January 2013. Due to the volume, breadth and complexity of work undertaken it necessarily took considerable time for the Auditor to consider and understand these reports in order to come to his own findings. This caused delays in finalising the environmental assessment reports, delays which were further exacerbated as these reports provided the factual basis upon which subsequent risk assessments were made. Those risk assessments were in themselves lengthy and highly complex and required groundbreaking toxicology research which was undertaken by eminent toxicologist Dr Roger Drew. The environmental and risk assessment reports on Fiskville were finalised by Cardno Lane Piper in March 2014.

The delays to finalising reports in respect of Fiskville similarly delayed the preparation of reports in respect of CFA’s six Regional Training Campuses (formerly

Independent Monitor – Fiskville Report – July 2015

Regional Training Grounds). Whilst the site assessments were conducted in 2012, the written reports were completed between September 2014 and April 2015. Despite this delay in completing the reports, Cardno Lane Piper briefed CFA on the findings as they became available with CFA taking corrective action immediately where warranted.

Governance

On 19 December 2011, the CFA Board established a Board Committee to oversight the Fiskville Project with the intention that it ensured the ongoing welfare and wellbeing of CFA members, their families and other parties as well as communications and other matters. Union representation was invited to this Committee which was accepted by Volunteer Fire Brigades Victoria, but not the United Firefighters Union. The Chief Executive Officer was a member of that committee and reported on the progress of the Informing the Future Program. This was later changed with the CEO reporting to a sub-committee of the Board which was established to focus on Health, Safety and Environment matters across all CFA activities. This sub-committee of the Board was comprised largely of Board members with additional membership bringing relevant Health, Safety and Environment expertise.

Additional oversight has been provided by Department of Justice and Regulation (formerly Department of Justice) since mid 2013.

In order to engage and inform the business on the Program of works being undertaken CFA established in late 2013 the Informing the Future Program , Project Board chaired by the Chief Executive Officer with following executive membership:-

- Executive Director, Business Services
- Executive Director, Operational Training and Volunteerism
- Executive Director, People & Culture
- Executive Manager, Assets Strategy
- Manager, Informing the Future Program

The Project Board meet regularly and the Independent Monitor – Fiskville, has attended some of those meetings as an observer. The Project Board will continue to be kept informed of the progress of the Informing the Future Program until completion of all activities.

Closure of Fiskville

On 2 March 2015 training operations at Fiskville were suspended temporarily following the detection of PFOS in a limited number of industrial training infrastructure outlets (pumps and hydrants) that supply water to the fire fighting training area.

On 26 March, 2015, the Fiskville facility was closed permanently following testing of more than 500 samples which confirmed the detection of PFOS in almost all of the

industrial training infrastructure outlets (pumps and hydrants) that supply water to the fire fighting training area and the unexpected detection of PFOS in training infrastructure located away from the Practical Area for Drills (PAD). Testing confirmed there was no PFOS in the mains water supply nor in the domestic water outlets.

The action of the CFA Board to permanently close the facility was for the safety and wellbeing of staff and volunteers as the Board could no longer guarantee the safety of the site.

Status of Recommendations and Initiatives

The Independent Monitor – Fiskville has been responsible for monitoring the implementation of the 10 IFI recommendations, 11 CFA Board Initiative and 18 recommendations arising from the Lawrence Review of Regional Training Grounds (Campuses). Considerable progress has been made with regard to the progression and implementation of the recommendation and initiatives with only a small number still to be finalised.

The relevant evidence as to initiation of the recommendations and initiatives has been viewed by the Independent Monitor – Fiskville. For those recommendations and initiatives that have been implemented, the relevant evidence as to implementation has been sighted by the Independent Monitor – Fiskville.

IFI Report Recommendations

Progress on the IFI recommendations has been significant. Of the 10 recommendations made by Professor Joy, 9 have been actioned and completed, refer to Appendix “A”.

At the time of writing the following recommendation, whilst it has been actioned, is yet to be completed:

Recommendation 8

That historical landfill 1 which has been disturbed by the construction of a walking track have its extent clearly identified, have an appropriate impermeable and properly drained cap constructed and be revegetated with shallow rooting species that will not compromise the integrity of the cap. This should ensure the safety of any people using the walking track.

Actioned - Cardno Lane Piper prepared and submitted a report “Investigation of Risks at Former Landfills” that found no risks associated with the landfills. The results of the landfill assessments conclude that there is negligible risk to groundwater and negligible risk to site users and residents as a result of landfill gas.

Independent Monitor – Fiskville Report – July 2015

The report was reviewed by the EPA-appointed Environmental Auditor as a part of his 53V Audit of Fiskville. The report was published on the EPA website on 7 July 2014 as an appendix to the EPA-appointed Environmental Auditor's Report.

The remediation of this area is to be subject to future works at Fiskville which are yet to be progressed.

Recommendation 1:

That the Executive Director, Informing The Future Program, be responsible for the on-going monitoring and reporting of the outstanding IFI recommendation.

Board Initiatives

Of the 11 CFA Board initiatives that were instituted by the Board in June 2012, 10 have been actioned and implemented, refer Appendix "B".

At the time of writing, 1 initiative remains outstanding:

Initiative 2:

Implementing ISO 14001 Environmental Management and along with AS4801 Occupational Health and Safety strive to gain accreditation in these business processes.

Actioned - This initiative commenced in 2013 and will be on-going until December 2016. On 5 February, 2015, a "Governance and Planning Workshop" for the leadership group was held at the Boronia Fire Station. That workshop was subsequently followed by a further workshop for the Training Campuses on 14 May 2015.

Recommendation 2:

That the Executive Director, Informing The Future Program, be responsible for the on-going monitoring and reporting of the implementation of ISO 14001 Environmental Management and AS4801 Occupational Health and Safety (Board Initiative 2).

Lawrence Report Recommendations

Of the 18 recommendations from the Lawrence Review of Regional Training Campuses, 14 have been actioned and implemented, refer Appendix “C”.

At the time of writing, the following recommendations remain outstanding:

Recommendation 9

That CFA develop a strategy to plan, fund, build and maintain an effective water supply system appropriate for each regional training ground.

Actioned - Significant preliminary work and planning has been undertaken to date. Immediate measures were implemented at all campuses in July 2012 to ensure the quality of water supply in the interim whilst a long term strategy is developed and implemented. Interim investments have been made to ensure sufficient water supply capacity exists to support training. Scheduled completion date is 30th June 2017.

Recommendation 11

That CFA develop medical/physical standards or guideline for trainees participating in arduous training regimes such as search and rescue.

Actioned - This is a matter that spans Directorates and is a significant project. Accountability for this Lawrence recommendation does not fit within OT&V. OT&V cannot mandate a medical/physical fitness standard for trainees in isolation from Fire & Emergency Management and the ED People & Culture.

Recommendation 12

That CFA develop an appropriate State wide strategy for planning, construction and maintenance of practical hot fire training facilities, including mobile facilities.

Actioned - The formal Mobile Trial is now completed, and a feedback report has been finalised and distributed. Based on this feedback, a decision was made to procure mobile training props. The props are currently being manufactured at Geelong. In addition, the ED OT&V will create and fill a permanent, senior Facilities Manager position within the OT&V structure with responsibility for managing all training campuses across the state. This will include responsibility for developing and implementing a state-wide strategy for planning, construction and maintenance of practical hot fire training facilities including mobile facilities. In June 2014 a Facilities Management System (FMS) was purchased for the Training Campuses. This system will provide central access to campus infrastructure thereby supporting the pursuit of a standardised approach across the State for planning, construction & maintenance. A significant 10 year funding bid has also been submitted to the Department of Treasury and Finance to support the strategy. This recommendation is in progress and is subject to funding.

Independent Monitor – Fiskville Report – July 2015

Recommendation 16

That CFA lay concrete in PAD areas exposed to flammable liquid fuels.

Actioned -. This work is dependent upon prior completion of environmental remediation works that may be required. Environmental assessments have been undertaken and recommended remediation actions are being considered and prioritised. In the interim, concrete has been poured to address an urgent requirement at Longereng campus. This recommendation is in progress and is subject to funding.

Recommendation 3:

That the Executive Director, Informing The Future Program, be responsible for the on-going monitoring and reporting of the outstanding Lawrence Report recommendations.

Recommendations from Cardno Lane Piper and 53V Audit Reports.

A large number of recommendations have resulted arising from the various Cardno Lane Piper reports relating to Fiskville. There are further recommendations arising from the Environmental Auditor (53V Audit Report) that require action by the CFA. These recommendations are detailed at Appendix “D” and the program of work for addressing these recommendations is described further below in the section titled ‘Fiskville Works’. The Auditor’s recommendations are subject to review and verification by the Environmental Auditor.

Cardno Lane Piper have recommended further actions to be undertaken as a result of their targeted site assessments of each of the six Regional Training Campuses. A high level plan has been drafted and a project has been initiated and resourced to implement these recommendations.

Going forward, these recommendations will need to be managed so as to ensure they are addressed.

Recommendation 4:

That the Executive Director, Informing The Future Program, be responsible for the on-going monitoring and reporting of the outstanding recommendations arising from the Cardno Lane Piper work and the 53V Audit Report.

EPA Clean Up Notice and Environmental Auditor (53V) Report

The EPA issued two Requirement of Clean Up Notices to CFA, dated 22 January 2013 (Notice IDs: 90003319 and 90003174). These Clean Up Notices were later revoked and superseded by Notices 90004570 and 90004571, dated 31 December 2013. The notices require two environmental audits to be undertaken. The first audit is an assessment of risk and was completed in 2014 as per the requirements of the Clean Up Notice. The second audit is an assessment of the site's suitability for use and is due in June 2017.

The first of the two environmental audits has been undertaken and the resulting Environmental Audit Report prepared by an Environment Protection Authority Victoria (EPA) appointed Environmental Auditor – Contaminated Land, of AECOM Australia Pty Ltd (AECOM), at the request of the Country Fire Authority (CFA).

This report has been prepared pursuant to Section 53V of the *Environment Protection Act 1970* (EP Act), and relates to the CFA Fiskville Training College, located at 4549 Geelong – Ballan Road, Fiskville, Victoria (the Site). The Audit is a requirement of a Clean Up Notice issued to CFA, dated 31 December 2013.

In undertaking the audit the auditor considered the work that had been undertaken by Cardno Lane Piper. In addition, the auditor conducted his own testing and analysis in order to draw his own conclusions. The EPA-appointed Environmental Auditor supported the findings of Cardno Lane Piper namely:

- Minor soil contamination was identified on-site at Fiskville and very minor levels immediately off-site, **none of which presents a human health risk or an impediment to continued use of the site for fire-fighting training.**
- It is highly unlikely that the fire-fighting training activities at the site have resulted in any significant contamination of groundwater in the area.
- A small area of saturated soil (about 1-3 metres deep around one of the dams) contains residues from foams used in past fire training. However, **this is not significant and does not present a human health risk.**
- **No buried drums were found in any of the areas identified in Professor Joy's Report.** If drums are still buried anywhere on site, there is only a minor potential for them to be a source of impact to groundwater as it occurs at a considerable depth (over 60 meters below surface level).

Independent Monitor – Fiskville Report – July 2015

- **Fiskville’s landfills do not present a risk to groundwater, site-users or local residents.**
- Surface water and sediment testing has confirmed Professor Joy’s findings that Dams 1 – 4 and Lake Fiskville contain Perflourooctane Sulfonate (PFOS) and Perflurooctanoic Acid (PFOA), and that residues have moved off-site via Lake Fiskville and are subject to significant dilution as they move downstream.

Outcomes of extensive scientific testing of the risks associated with direct exposures to this water and sediments (such as from swimming, drinking and hot fire training) or secondary exposures (such as from eating fish, produce or meat from livestock exposed to this water and sediment) have confirmed:

- **Human health risks from potential exposures to these Perfluorinated Compounds (PFC) residues on-site at Fiskville and downstream are low and acceptable.**
- **Produce grown on properties downstream from Fiskville, including meat, is safe for human consumption. This has been confirmed by Victoria’s health and food safety authorities.**
- **The historical use of Fiskville dam water for fire training does not present a risk to CFA staff, volunteers, site visitors or occupants** (noting this source of water is no longer used and that town mains water has been used solely since late June 2012 until site closure in March 2015).
- There is evidence of bioaccumulation of Perfluorinated Compounds (PFCs) in aquatic biota in Lake Fiskville, and while biota was not found in the Beremboke Creek and Eclipse Creek it is assumed that if any were present they would be likely to have accumulated PFCs. There is very limited evidence of bioaccumulation of PFCs in very small concentrations in fish from a site on the Moorabool River.

The outcomes of Cardno’s assessments of the aquatic ecology in these water bodies conclude that **the ecological risk is considered low to moderate. The low to moderate risks to the aquatic ecology include possible impacts on fish and other aquatic species in Lake Fiskville and the consumption of these species by higher order organisms (such as birds of prey).**

The EPA-appointed Environmental Auditor has concluded in his audit report that steps already planned by CFA and underway to remediate the site will reduce the risks.

Results of all the assessments, by both the EPA Auditor and Cardno Lane Piper, confirm that while residues from historical use of firefighting foams no longer in use by CFA at Fiskville have been detected, they exist in concentrations very unlikely to pose any risk to human health – both at Fiskville and downstream.

The EPA-appointed Environmental Auditor’s recommendations include measures to stop further discharges of water from the water management system and Lake Fiskville and implement measures to remediate and manage the surface water and sediments in Lake Fiskville and the dams linked to the lake. The first stage of this work has been undertaken with storm-water and creek diversion works and the creation of a wetland at Fiskville. It has since been identified that the integrity of the storm-water and wetland works have been compromised and there is potential for PFCs to discharge into the Beremboke Creek (refer below).

The recommendations of the EPA-appointed Environmental Auditor are detailed at Appendix “D”.

Fiskville Works

As mentioned above a large number of recommendations have resulted arising from the various Cardno Lane Piper reports and the Environmental Auditor (53V Audit Report) that require action by the CFA. These recommendations are detailed at Appendix “D” and documented within a program of work referred to as the ‘Clean Up Plan’ as per requirements of the Clean Up Notices issued by EPA in 2013. The Clean Up Plan was prepared by CFA, endorsed by the Environmental Auditor and approved by the EPA on 18 July 2014. The Clean Up Plan is organised into six stages of work and incorporates recommendations made by Cardno Lane Piper, recommendations of the Environmental Auditor (53V Audit Report) and the requirement to conduct a second environmental audit of the Fiskville site.

As this work is in response to the EPA Clean Up Notices and recommendations from the Environmental Auditor’s 53V Audit Report, oversight of the completion of the works will be undertaken by the EPA, and will not be the responsibility of the Independent Monitor Fiskville

Stage 1

Stage 1 works were undertaken to prevent training water flowing downstream from Lake Fiskville to Beremboke Creek whilst CFA plan and execute remediation works for the site (as outlined in Stage 4). These works were well advanced when the Environmental Auditor issued his environmental audit report in April 2014 in which he made a recommendation to cease discharging water to downstream. The works

Independent Monitor – Fiskville Report – July 2015

involved the diversion of the Beremboke Creek around Lake Fiskville in order to contain onsite all water that has been used in fire fighting training activities (training water) and prevent it flowing downstream. The storage capacity of the lake was increased by raising (bundling) the sides of the lake. With the water storage system closed, further measures were undertaken to minimise the risk of the lake's capacity being exceeded and overflowing. These measures involved capturing rainwater and diverting it through stormwater diversion channels, into a purpose built wetland to filter stormwater before it flowed into Beremboke Creek and offsite. The Tender for stage 1 works was awarded to Bitu Mill (Vic) Pty Ltd on 9 December 2013. Works commenced on 8 January 2014 and were completed on 3 July 2014.

Recent testing of the stormwater channels, wetland and Beremboke Creek have detected PFCs and determined these are seeping into the stormwater channels that border the industrial training area. Those concentrations of PFCs have been similar to those detected in the past and therefore do not represent any change in the risk previously assessed as low and acceptable nonetheless, actions are being taken to address this including shutting off the wetlands so it no longer discharges into Beremboke Creek. Once this work has been undertaken, further water testing of Beremboke Creek will need to be undertaken.

Stage 2

Stage 2 requires further environmental assessments to be undertaken. These will address recommendations from the Environmental Auditor (53V Audit Report) and will also satisfy the second of two environmental audits as required by the Clean Up Notices issued by EPA in 2013. The second audit will consider the entirety of the site in accordance with section 53X of the Environment Protection Act. This work commenced in January 2015.

Stage 3

Stage 3 addresses one recommendation from the Environmental Auditor (53V Audit Report) requiring communications to the people living and working downstream of Fiskville. This stage was completed in October 2014.

Stage 4 works

Stage 4 addresses remediating the site to address environmental impacts caused by hot fire fighting training activities, particularly those activities that involved foams which were in use until 2007.

An *Expression Of Interest* (EOI) was issued on 8 October 2014 to the open market on the Tenders Vic Website. The EOI was the first stage of a multi-stage tender process

Independent Monitor – Fiskville Report – July 2015

to identify prospective tenderers that had suitable capacity, capability and experience to design, construct and implement solutions to:

- Upgrade water treatment infrastructure on the hot fire training PAD to appropriately treat training waste water generated during ongoing hot fire training to a standard suitable for either release to the environment or recirculation and reuse for training;
- Remediate the surface waters in Dams 1-4 and Lake Fiskville;
- Remediate perched groundwater in the scoria between the dams and also at the southern end of Lake Fiskville; and to
- Remediate the sediments in Dams 1-4 and Lake Fiskville.

This is the first step in working towards satisfying several recommendations made by the EPA-appointed Environmental Auditor (53V Audit Report) for Fiskville in relation to remedial activities. The EOI resulted in 10 responses from organisations that demonstrate expertise to complete the works.

As a multi stage procurement process for remediation works was currently underway at the time of the Site closure being announced in March 2015, independent legal and specialist probity advice was obtained regarding the effect of the site closure on the current procurement process. Due to the large changes in scope and project value, the current procurement process has been terminated and a new Open Market process will be established.

With the closure of the Fiskville facility on 26 March 2015, the scope of the future remediation works to be undertaken under the Stage 4 works is being redefined and will be subject to regulatory compliance with EPA. These works will be substantial as CFA are required to remediate the site regardless of operational activity.

Stage 5 works

Stage 5 involves the development and implementation of management plans and operational controls to minimise risk and provide advice for handling issues as they arise. This work is underway and is closely aligned to, and overlaps with, the Health, Safety and Environment Management System being developed to address Board initiative 2.

Stage 6 works

Stage 6 addresses the requirement to ensure the quality of surface water bodies at the site and those discharging downstream are monitored. This work has commenced and will continue ongoing at least until, and possibly beyond, remediation of the site being completed (as per Stage 4).

Health Initiatives

Arising from the CFA Board's considerations of the IFI Report, the Board established initiatives, two of which are relevant to the health of past and present employees and volunteers.

Health Surveillance Program

The CFA established a health program involving an annual medical (including pathology) in late 2012 and offered to individuals identified as being in the high or medium risk of exposure groups in the IFI Report. It is a five years program and the participants were subject to medical examination by their own GP or the CFA Doctor.

- not all those who were offered the Program have taken up the offer;
- some did not take up the offer initially, but did at a later time; and
- some who accepted the offer, later withdrew from the program.

The following table shows the status of the Program as at 25 Feb 2015, based on information provided by the CFA Health Surveillance Co-ordinator.

Independent Monitor – Fiskville Report – July 2015

Risk of exposure group	Number of individuals offered the Program	Number of individuals that have accepted the offer	Number of annual medicals undertaken by individuals to date
High Risk	87	68	Zero medicals: 2 One medical: 12 Two medicals: 29 Three medicals: 25
Family members (of the High risk Group)	8	7	Two medicals: 7
Medium	257	158	Zero medicals: 20 One medical: 45 Two medicals: 82 Three medicals: 11
Total	352	233	

This Health Surveillance Program is the only outstanding CFA Board initiative and will be on-going until 2017.

Recommendation: 5

That the CFA Board assigns responsibility to the Executive Director, People and Volunteerism for the on-going Health Surveillance Program monitoring and reporting.

Monash Study

The Monash Centre for Occupational and Environmental Health (MonCOEH) School of Public Health & Preventive Medicine undertook a health study relative to those CFA staff and volunteers who were identified in the high, medium and low risk groups in the IFI Report.

The findings of the study were presented to the CFA in December 2014 and subsequently released publicly. The study found higher than expected rates of

Independent Monitor – Fiskville Report – July 2015

skin, testicular and brain cancer. However, when compared with the Victorian community, the overall incidence of cancer was not higher for the study group as a whole.

The summary at pages 4 & 5 of that report in part stated:-

“The CFA assembled a data set of five women, and 611 men who had either been trainers or had been trained at Fiskville between 1971 and 1999. These individuals were categorized into High, Medium and Low groups by the CFA. Two women did not appear to have been involved in training at Fiskville and were excluded from the cohort. In addition, there were eight men who had no date of birth, who were excluded due to difficulty linking with the cancer and death registries. The final cohort of 606 people included three women, and had 95 men in the High group, 256 men in the Medium group (105 career firefighters and 151 volunteer firefighters) and 252 men in the Low group.

The cohort was linked to the National Death Index and Australian Cancer Database (both held by the Australian Institute for Health and Welfare) and to the Victorian Cancer Registry. No deaths or cancers were identified for the three women in the cohort. There were 28 deaths and 69 cancers identified among the men in the cohort.

When compared to the Victorian population, higher than expected cancer rates were observed for melanoma and cancer of the testis in the High group and for brain cancer in the Medium group.

When compared to the Victorian population and to the Australian-born Victorian population, the overall cancer risk was significantly raised for the High group, it was similar to that of both these reference groups for the Medium group and was significantly reduced for the Low group.

When compared to the Low group, there was a statistically significantly increased cancer risk for the Medium and High groups, but the number of cancers in the Low group was very small, resulting in a lot of imprecision in the results and this is likely to impact on the robustness of these findings. When compared to the general Australian population, the overall mortality was statistically significantly decreased for the whole cohort and for the Low and Medium groups within the cohort. This reduction in mortality may be due, at least in part, to the healthy worker effect. For the Low group and the volunteer firefighters in the Medium group in particular, the low mortality may also be a result of an ascertainment bias, that is some individuals who had died may have been less likely to have been identified and included in the cohort. The mortality for the career Medium group and the High group was also reduced but not statistically significantly so.”

A similar study undertaken by **Cancer Council Victoria** of people who worked and trained at Fiskville during the period 1971-1999 was released in June 2014. That study found that this same study group as a whole did not develop cancer at a higher rate than the general population of Victoria, and identified melanoma and cancer of the testis as the most common cancers in the ‘high’ and ‘medium’ groups.

IFI Report Recommendations

Recommendation 1

That soil and groundwater quality be assessed in areas where fuel storage tanks are currently located or have been located in the past both above and below ground.

COMPLETED - Cardno Lane Piper has completed and presented two reports relative soil and ground water assessments, namely “Site History Review” and “Targeted Soil Assessment”. Those reports identified minor soil contamination on site at Fiskville and very minor levels immediately offsite, none of which presents a human health risk or an impediment to continued use of the site for fire-fighting training.

The reports were reviewed by the EPA-appointed Environmental Auditor as a part of his 53V Audit of Fiskville. The reports were published on the EPA website on 7 July 2014 as an appendix to the EPA-appointed Environmental Auditor’s Report.

Recommendation 2

That groundwater investigations be undertaken in the vicinity of: the historical flammable liquids PAD (Practical Area for Drills); the fuel mixing area; the historical foam training pits; the prop storage area; and the area used to rehabilitate contaminated soils in 1998.

COMPLETED - Cardno Lane Piper completed and submitted a report that found no contamination of groundwater. The report was reviewed by the EPA-appointed Environmental Auditor as a part of his 53V Audit of Fiskville. The reports were published on the EPA website on 7 July 2014 as an appendix to the EPA-appointed Environmental Auditor’s Report.

Recommendation 3

That further investigation be undertaken into surface waters in and discharging from Lake Fiskville to:

- better quantify the risk to downstream human health receptors, taking into account downstream dilution and environmental fate and transport mechanisms;
- investigate potential sources of PFOA and PFOS discharges to Lake Fiskville and discharging off site, if the potential risk of adverse impact on downstream human health receptors is found to be unacceptable;

Independent Monitor – Fiskville Report – July 2015

- collect surface water samples at a representative location to assess whether the reported copper and zinc concentrations are consistent with background levels; and
- Assess the ecological condition of Lake Fiskville.

COMPLETED - Cardno Lane Piper has prepared and submitted two reports, namely "Surface Water and Sediment Contamination Assessment – Onsite" and "Surface Water and Sediment Contamination Assessment – Downstream". The reports confirmed that human health risks from potential exposures to Perfluorinated Compounds (PFC) residues on-site at Fiskville and downstream are low and acceptable.

A report relative to the ecological condition of Lake Fiskville found that the ecological risk is considered low to moderate.

Reports, namely "Human Health Risk Assessment – CFA Training Personnel" and "Human Health Risk Assessment – Fiskville Community" found that the risks of health effects arising from exposure to PFC's in water used for fire-fighting training at Fiskville are negligible.

A report "Human Health Risk Assessment – Offsite Downstream" found that risks of health effects arising from downstream water contamination are very unlikely.

The reports were reviewed by the EPA-appointed Environmental Auditor as a part of his 53V Audit of Fiskville. The reports were published on the EPA website on 7 July 2014 as an appendix to the EPA-appointed Environmental Auditor's Report.

Recommendation 4

That any electrical transformers located at any CFA training sites be inspected by an independent hygienist and, if not able to be certified as PCB-free under the National Polychlorinated Biphenyls Management Plan 2003, that it be treated as a scheduled waste and disposed of in accordance with the provisions of the Plan.

COMPLETED - All transformers have been removed and replaced with replicas. None were found to contain PCB's¹, and all have been appropriately disposed of in accordance with EPA requirements.

Exposure of People On and Off Site

Recommendation 5

That any subsequent study of possible linkages between exposure of persons during training at Fiskville to materials such as flammable liquids and health effects evaluate the usefulness of the qualitative assessment of relative risk of exposure of different groups developed in Chapter 7.

¹ Polychlorinated Biphenyl

Independent Monitor – Fiskville Report – July 2015

COMPLETED - Reports, namely “Human Health Risk Assessment – CFA Training Personnel” and “Human Health Risk Assessment – Fiskville Community” found that the risks of health effects arising from exposure to PFC’s in water used for fire-fighting training at Fiskville are negligible.

The reports were reviewed by the EPA-appointed Environmental Auditor as a part of his 53V Audit of Fiskville. The reports were published on the EPA website on 7 July 2014 as an appendix to the EPA-appointed Environmental Auditor’s Report.

Monash University Centre for Occupational and Environmental Health has been engaged by CFA to undertake the CFA Cancer Incidence and Mortality Study - Fiskville, which will examine the incidence of cancer and causes of death of those identified by the Professor Rob Joy Report in the moderate and high risk category of exposure to chemicals. Report on the findings is expected in late 2014.

CFA has initiated a Health Surveillance Program for all those identified as being in the high and medium risk exposure groups. This program is on-going.

Recommendation 6

That procedures be put in place to protect the health of personnel potentially exposed to waters and sediments in Dams 1 and 2 of the firewater treatment system and, in particular, to manage the risks to individuals who have the potential to come into contact with sediments in the dams during routine maintenance.

COMPLETED - Risks have been identified and controls have been implemented in consultation with WorkSafe. On 3rd October 2012, WorkSafe advised that compliance had been achieved.

CFA ceased the use of dam water for hot fire training on 26th July 2012 and switched to the sole use of town mains water, which is stored in two fully enclosed above ground tanks.

Fire Training Water Systems standing operating procedures have been reviewed and new procedures implemented.

Cardno Lane Piper submitted a letter outlining their findings which has been reviewed by the EPA-appointed Environmental Auditor as a part of his 53V Audit of Fiskville. The report was published on the EPA website on 7 July 2014 as an appendix to the EPA-appointed Environmental Auditor’s Report.

Buried Drums

Recommendation 7

That soil and groundwater quality be assessed in the following areas that were not examined during the site investigation stage of the Preliminary Site Assessment of Fiskville (see Figure 8.1)²:

- Part of Drum Burial Area 1 (south of the Airstrip and south of Deep Creek Road);
- Drum Burial Area 2 (north of the Administration Building);
- Drum Burial Area 3 (east of the Administration Building)
- Historical landfills 1 and 2.

COMPLETED - Cardno Lane Piper prepared and submitted a report "Buried Drums Assessment" that identified that no buried drums were found in the areas identified by Professor Joy.

That report was reviewed by the EPA-appointed Environmental Auditor as a part of his 53V Audit of Fiskville. The report was published on the EPA website on 7 July 2014 as an appendix to the EPA-appointed Environmental Auditor's Report.

Recommendation 8

That historical landfill 1 which has been disturbed by the construction of a walking track have its extent clearly identified, have an appropriate impermeable and properly drained cap constructed and be revegetated with shallow rooting species that will not compromise the integrity of the cap. This should ensure the safety of any people using the walking track.

ACTIONED - Cardno Lane Piper prepared and submitted a report "Investigation of Risks at Former Landfills" that found no risks associated with the landfills. The results of the landfill assessments conclude that there is negligible risk to groundwater and negligible risk to site users and residents as a result of landfill gas.

The report was reviewed by the EPA-appointed Environmental Auditor as a part of his 53V Audit of Fiskville. The report was published on the EPA website on 7 July 2014 as an appendix to the EPA-appointed Environmental Auditor's Report.

The remediation of this area is to be subject to future works at Fiskville which are yet to be progressed.

² IFI Report pg 101.

Recommendation 9

That any decision on the future management of historical landfill 2, including possible exhumation of buried drums and further site rehabilitation, await the results of soil and groundwater quality assessment at the site (Recommendation 8).

COMPLETED - Assessment completed – as noted above for Recommendation 8.

Regional Training Grounds

Recommendation 10

That the site specific recommendations of the Golder Associates' Preliminary Site Assessment – CFA Regional Training Grounds be adopted including recommendations to:

- Undertake targeted soil and groundwater investigations at sites where possible sources of contamination have been identified;
- Assess fire fighting water quality for contaminants associated with flammable liquids and extinguisher foams;
- Assess water quality where discharges occur to the environment.

COMPLETED -

Cardno Lane Piper has undertaken targeted environmental assessments of each of the Training Campuses detailing remediation works required to be undertaken.

A draft "Action Plan" has been prepared to address:

- a) recommendations by Cardno as part of their targeted site assessments in 2012 (targeted to specific areas identified by Prof Joy as greatest risk) and
- b) additional recommendations made in 2015 taking into account each site in its entirety (not just targeted to specific areas).

A Project Manager has been appointed to manage these recommendations going forward.

Appendix “B “

CFA Board Initiatives

	INITIATIVE	STATUS
1	Establish a Board Committee for OHS&E that will also have independent membership with relevant expertise.	COMPLETED First Committee meeting held 1 October 2012
2	Implementing ISO 14001 Environmental Management and along with AS4801 Occupational Health and Safety strive to gain accreditation in these business processes.	COMMENCED - The ISO 14001 project has commenced and is being led by the newly appointed Environmental Adviser. The AS4801 project commenced in July 2013 and is striving to achieve accreditation in these business processes for all training campuses by December 2016. This initiative is ongoing and as such cannot be finalised within this report.
3	Include a Standing Item on Board agenda’s relating to progress reports on implementation of the Report.	COMPLETED Agenda item established.
4	Arrange for external independent audit of our actions to implement the Professor Joy Report and making the audit results publically available.	COMPLETED Independent Monitor appointed February 2013.
5	Acquire specialist personnel around environmental management to support personnel who are already working on health and safety, and increase the presence across the State around OHS&E.	COMPLETED Environmental Advisor appointed December 2012.

Independent Monitor – Fiskville Report – July 2015

6	Allocate the executive responsibility and management and control for all Training Grounds with the Executive Director Operational Training and Volunteerism. The Regional Site Review issues and recommendations will be considered, assessed and implemented by OT&V in a manner that is complimentary to the Professor Joy Report and recommendations.	COMPLETED Transition finalised on 1 July 2013.
7	Provide project management capability for the implementation of recommendations.	COMPLETED Program Manager appointed August 2012.
8	Provide health monitoring for those identified as being in a high or medium risk of exposure group.	COMPLETED Health Surveillance Program established September 2012.
9	Commissioning a health impact study to examine the linkages between the risk of exposure to hazardous materials at Fiskville and health effects.	COMPLETED Monash Health Study completed December 2014.
10	Provide Information Packs to CFA members and families outlining the support services available.	COMPLETED Information packs placed on CFA Website in July 2012.
11	Make Information Packs available for the public which will incorporate details on accessing community based services. These packs are intended to target those in the community who feel they could be affected by their involvement with Fiskville or because they live or work close to Fiskville training facility.	COMPLETED Information packs placed on CFA Website in July 2012.

Lawrence Report Recommendations

<u>Recommendation</u>	<u>Action</u>	<u>Timeframe</u>
<p>1. It is recommended that CFA review the operation of the Training Grounds Standards Committee including its Terms of Reference and ensure that this committee meets regularly, actively sets standards, monitors compliance and meets the needs of the Chief Officer, OT and V, Managers and users of training grounds across the State of Victoria.</p>	<p>Action: As part of the Regional Training Campus transition the Training Grounds Standards Committee shall be replaced by a Training Campus Health, Safety & Environment Committee (TCHSE) that will focus on standards and compliance across training campuses. This committee will meet on a regular basis at least three monthly.</p> <p>Status: The TCHSE Committee has been established to replace the Standards Committee. Terms of Reference for the Committee have been established.</p> <p>The first meeting of the TCHSE Committee was held on the 25th September 2013. The TCHSE Committee has a membership of Health & Safety Representatives from Fiskville, Bangholme and Regional Training Campuses and there are also three Management Representatives. The TCHSE Committee has linkages upward into the CFA Board HSE Sub- Committee through the Director People & Culture and downward into existing Campus HSE Committees.</p>	<p>Completed</p>

Independent Monitor – Fiskville Report – July 2015

<u>Recommendation</u>	<u>Action</u>	<u>Timeframe</u>
<p>2. It is recommended that where audits, investigations, reports etcetera are completed and actions, findings or recommendations are made, establish governance arrangements that ensures senior management are informed on the status.</p>	<p>Action: Establish governance arrangements that ensure senior management are informed on the status of audits, investigations, reports etcetera.</p> <p>Status: Under normal operations, the relevant Executive Manager (i.e. the one that commissioned the report or investigation) is responsible for establishing governance arrangements, or delegating this to an appropriate person or body.</p> <p>The TCHSE Committee is responsible for managing the outcomes (actions, findings or recommendations) of Health, Safety and Environment audits and reporting to management on the status of outcomes. This is documented within the HSEMS document titled 'HSE Roles, Responsibility & Committees'. The Training Campus Health Safety & Environment Committee has been established and held its first meeting on 25th September 2013.</p> <p>The CFA Corporate CIRT³ Program has also been established by Performance & Strategy Directorate to assist with such monitoring and reporting for future audits, investigations, etc.</p>	<p>Completed</p>

³ The Commission and Inquiry Recommendation Traceability Program (CIRT) is managed by the CFA Enterprise Program Management Office (Performance & Strategy directorate). CIRT provides the tools and processes to capture the recommendations and the subsequent actions that are taken.

Independent Monitor – Fiskville Report – July 2015

<u>Recommendation</u>	<u>Action</u>	<u>Timeframe</u>
<p>3. It is recommended that where audits, investigations, reports etcetera are completed and actions, findings or recommendations are made, ensure a system is established that ensures action plans are completed and regularly reported on to management.</p>	<p>Action: Establish a system that ensures action plans are completed and regularly reported on to management.</p> <p>Status: Under normal operations, bodies to which responsibility is delegated (as per Recommendation 2 above) are required to establish the monitoring and reporting processes.</p> <p>The TCHSE Committee referred to in Recommendation 1 and 2 above will be required to monitor and report on outcomes of Health, Safety and Environment audits and subsequent activities to address those outcomes, and that the body to who they report is responsible for sign off on completion of the subsequent activities. The Training Campus Health Safety & Environment Committee has been established and held its first meeting on 25th September 2013.</p> <p>The CFA Corporate CIRT⁴ Program has also been established by Performance & Strategy Directorate to assist with such monitoring and reporting for future audits, investigations, etc.</p>	Completed
<p>4. It is recommended that CFA provide appropriate training for PAD supervisors, PAD staff and Instructors to ensure currency of knowledge on legislative requirements for Dangerous Goods & Hazardous Substances Storage and Handling.</p>	<p>Action: A suitable course be sourced and delivered on an ongoing basis for PAD Supervisors/PAD Staff and Campus based Instructors to maintain currency in this field.</p> <p>Status: Appropriate courses were identified with provider Wynsafe and were delivered at each Campus to relevant staff commencing in March 2014. Wynsafe will inform CFA when new/updated training is necessary (eg. as legislation changes).</p>	Completed

⁴ The Commission and Inquiry Recommendation Traceability Program (CIRT) is managed by the CFA Enterprise Program Management Office (Performance & Strategy directorate). CIRT provides the tools and processes to capture the recommendations and the subsequent actions that are taken.

Independent Monitor – Fiskville Report – July 2015

<u>Recommendation</u>	<u>Action</u>	<u>Timeframe</u>
<p>5. It is recommended that CFA provide appropriate training for PAD supervisors, PAD staff and Instructors to ensure currency of knowledge on legislative requirements for occupational Health & Safety.</p>	<p><u>Action:</u> A suitable course be sourced and delivered on an ongoing basis for PAD Supervisors/PAD Staff and Campus based Instructors to maintain currency in this field Review current qualifications of campus permanent staff and ensure they have completed the OH&S course. Where they have not completed the course arrange enrolment.</p> <p><u>Status:</u> Courses were identified with provider Interactive Training Services Pty Ltd and were delivered at each Campus to relevant staff commencing in March 2014.</p>	Completed
<p>6. It is recommended that CFA review the Field Training Ground Management Manual for currency.</p>	<p><u>Action:</u> Conduct review of the Field Training Ground Manual.</p> <p><u>Status:</u> Funding was secured and Cube Consulting was engaged to conduct the review and their report on the review of the Field Training Ground Manual has been tabled. “A day in the life of a PAD Supervisor” Workshop has been completed with Chapter headings and ownership for development of content identified.</p> <p>The outcome of the CUBE Review is being addressed by Informing the Future Team’s Project 12, which is focussing on developing and implementing a Health Safety & Environment Management System that is compliant with AS4801 and ISO 14001.</p>	Completed
<p>7. It is recommended that CFA establish an ongoing process for review of the Field Training Ground Management Manual that requires reporting to senior management.</p>	<p><u>Action:</u> Establish an ongoing process for review of the Field Training Ground Management Manual that requires reporting to senior management.</p> <p><u>Status:</u> As per Recommendation 6 above, the outcome of the CUBE Review is being addressed by Informing the Future Team’s Project 12, which is focussing on developing and implementing a Health Safety & Environment System. This will deliver work instructions and procedures and a process for ongoing review and development. See ITPF project 12 for status.</p>	Transferred to ITPF project 12

Independent Monitor – Fiskville Report – July 2015

<u>Recommendation</u>	<u>Action</u>	<u>Timeframe</u>
<p>8. It is recommended that CFA conduct ongoing research on best practice for delivery of realistic hot fire training including latest development of props, fuels etcetera.</p>	<p>Action:</p> <ol style="list-style-type: none"> 1. Arrange for CFA Training Campus personnel to tour other facilities and exchange learnings regarding best practice hot fire training delivery. 2. Undertake research into alternative Hot Fire Training fuel. 3. Create a fill a new position for a professional Facilities Manager of all training campuses and embed responsibility for ongoing research into their position accountabilities. <p>Status: The Fiskville PAD Supervisor and OM Training Delivery recently visited hot fire training facilities in America and NZ to conduct research and share learnings.</p> <p>Biodiesel testing was completed at Bangholme Campus on 20/11/13. The trial concluded the unsatisfactory performance of bio-diesel as a hot fire training fuel due to the difficulty getting it to burn independent of an accelerant. It was determined that Liquid Petroleum Gas (or Natural Gas where it is available) will be the preferred flammable training fuel into the foreseeable future. As the first step, Sunraysia Campus will be designed and built so that LPG is the primary fuel source.</p> <p>Research is undertaken as part on normal campus operations and is done so on an as-needed and opportunistic basis. A systematic process for ongoing research is yet to be established - this will be aided by the implementation of the Training Campus Health, Safety and Environment System and possibly by the mid-2014 centralisation of all Victorian emergency management training facilities under the umbrella of the newly established Emergency Management Victoria (EMV).</p> <p>On 11 February 2015, ED OT&V and Program Manager Informing the Future met with the CEO of the Facilities Management Association of Australia. The purpose of the meeting was to seek his advice regarding a process for creating and filling a permanent, senior Facilities Manager position within OT&V responsible for managing all training campuses across the state.⁵</p>	<p>Completed except for establishing a senior Training Campus Facilities Manager position</p>

⁵ A re-structure was announced on 19 March 2015 in which OT&V will merge with the People & Culture directorate and as a result the earlier decision to create this position will need to be reviewed, in the context of this re-structure.

Independent Monitor – Fiskville Report – July 2015

<u>Recommendation</u>	<u>Action</u>	<u>Timeframe</u>
<p>9. It is recommended that CFA develop a strategy to plan, fund, build and maintain an effective water supply system appropriate for each regional training ground.</p>	<p>Action: Engage Cardno Lane Piper to prepare ‘fit for purpose’ Water Quality Criteria and a draft Training Campus Water Quality Management Plan (for CFA to customise) for the Training Campuses. Cardno Lane Piper to also complete a Feasibility Study for training water system upgrades at Fiskville and Targeted Environmental Assessments for each campus (including reviews of training water management systems). The outcomes of this work are to be considered by CFA and used as inputs to a strategy and plan for effective water management at each training campus.</p> <p>Status:</p> <p>In July 2012 CFA suspended the recirculation of training water at all campuses and switched to town mains water, except for Bangholme which has a purpose built water treatment system. At this time, the training campus water testing regime was reviewed and updated in accordance with the use of town mains water.</p> <p>The plan, fund and build elements (<u>initial investment</u>) of this recommendation are being addressed by the Informing the Future Program (ITFP) which also addresses recommendations of the IFI:</p> <ul style="list-style-type: none"> • Cardno completed their Fiskville Feasibility Study in December 2013, and their Water Quality Criteria Report and draft Water Quality Management Plan in March 2014. • CFA have obtained funding (via BEREC) and completed stage 1 site works at Fiskville to upgrade the water training management system. An EOI was released to the open market for stage 2 works which will complete the implementation of a fully upgraded training water management system at the Site. This procurement activity was terminated following the closure of the site in March 2015. • Cardno have undertaken Targeted Environmental Assessments for each Regional Training Campus. Environmental advisers have been engaged to assist CFA with the preparation of strategies and plans for implementation. 	<p>In progress – to be completed by 30 June 2017</p>

Independent Monitor – Fiskville Report – July 2015

<u>Recommendation</u>	<u>Action</u>	<u>Timeframe</u>																												
9 (continued)	<p>Note that completion of the work outlined above is pending Ministerial approval, which may be dependent upon the outcomes of the anticipated Victorian Joint Parliamentary Inquiry into Fiskville. Refer to ITFP project 74 for ongoing status updates.</p> <p>The ongoing funding for these matters is being addressed by OT&V. Centralisation of all training campus assets under OT&V was completed in June 2013 (refer to ITFP project 16) – this was the first step in ensuring training campuses are sufficiently funded in future, and that such investments are made strategically, with a statewide perspective. Funding for assets (including water supply systems) was included in a budget submission (training asset 10-year capital replacement plan totalling \$36.6 m) submitted to DTF in November 2014.</p> <p>The maintenance of existing infrastructure is also being addressed by OT&V, and is performed as part of campus operations. Responsibility for the maintenance of new infrastructure being procured by the ITFP rests with ITFP during the commissioning of that infrastructure, and will be transferred to OT&V prior to the completion of the ITFP (in mid-2017).</p> <p>Interim investments have been made as needed, to ensure training campuses remain operational whilst the strategy for an effective water supply system at each campus is developed and implemented:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Item description</th> <th style="text-align: left;">Campus</th> <th style="text-align: left;">Year purchased</th> <th style="text-align: left;">Purchase price (ex GST)</th> </tr> </thead> <tbody> <tr> <td>PAD Training Water Tank (260,000 Litre)</td> <td>Fiskville</td> <td>FY2012-13</td> <td>\$ 44,921.45</td> </tr> <tr> <td>Water Pump & Power Pack</td> <td>Sale</td> <td>FY2012-13</td> <td>\$ 33,600.00</td> </tr> <tr> <td>PAD Training Water Tank (286,00 Litre)</td> <td>Sale</td> <td>FY2013-14</td> <td>\$ 22,965.76</td> </tr> <tr> <td>Pump Shed</td> <td>Sale</td> <td>FY2013-14</td> <td>\$ 3,200.00</td> </tr> <tr> <td>PAD Training Water Tank (20,000 Litre)</td> <td>Longerenong</td> <td>FY2013-14</td> <td>\$ 17,110.70</td> </tr> <tr> <td>PAD Training Water Tank (286,000 Litre)</td> <td>Huntly</td> <td>FY2013-14</td> <td>\$ 78,161.00</td> </tr> </tbody> </table>	Item description	Campus	Year purchased	Purchase price (ex GST)	PAD Training Water Tank (260,000 Litre)	Fiskville	FY2012-13	\$ 44,921.45	Water Pump & Power Pack	Sale	FY2012-13	\$ 33,600.00	PAD Training Water Tank (286,00 Litre)	Sale	FY2013-14	\$ 22,965.76	Pump Shed	Sale	FY2013-14	\$ 3,200.00	PAD Training Water Tank (20,000 Litre)	Longerenong	FY2013-14	\$ 17,110.70	PAD Training Water Tank (286,000 Litre)	Huntly	FY2013-14	\$ 78,161.00	
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Independent Monitor – Fiskville Report – July 2015

<u>Recommendation</u>	<u>Action</u>	<u>Timeframe</u>
<p>10. It is recommended that CFA review the use of firefighting water at regional training grounds and set, maintain and monitor recommended standards.</p>	<p><u>Action:</u> Review the use of firefighting water supply at regional training grounds and set, maintain and monitor recommended standards.</p> <p><u>Current Status:</u></p> <p>In July 2012 CFA suspended the recirculation of training water at all campuses and switched to town mains water, except for Bangholme which has a purpose built water treatment system.</p> <p>The Training Campus Water Management Plan was reviewed in July 2012 and updated in accordance with the use of town mains water.</p> <p>Results of Training Campus water test results since July 2012 are posted on CFA’s website. On the 26th September 2013 pt Environmental delivered training to PAD Supervisors on water testing protocols, interpretation of results & consistency of approach to sampling.</p> <p><u>Actions for the future:</u></p> <p>Further / ongoing reviews of Training Campus water management are progressing in accordance with item 9 above.</p>	<p>Completed</p>

Independent Monitor – Fiskville Report – July 2015

<u>Recommendation</u>	<u>Action</u>	<u>Timeframe</u>
<p>11. It is recommended that CFA develop medical/physical standards or guidelines for trainees participating in arduous training regimes such as search and rescue.</p>	<p><u>Action:</u> Develop medical/physical standards or guidelines for trainees participating in arduous training regimes.</p> <p><u>Status:</u></p> <p>This is a matter that spans Directorates and is a significant project. Accountability for this Lawrence recommendation does not fit within OT&V. OT&V cannot mandate a medical/physical fitness standard for trainees in isolation from Fire & Emergency Management and the ED People & Culture.</p> <p>In recognition of this, the ED OT&V will prepare a memo to the Chief Officer, F&EM and the ED People & Culture regarding an appropriate process for the development of this standard. It is anticipated this will take quite some time to resolve and will require significant consultation with key stakeholders.</p> <p>In the meantime, this matter was partially addressed via a Heat Stress Management Bulletin issued by the Chief Officer on 20/1/12.</p> <p>In addition, P&C in consultation with OT&V, have agreed to offer Health Support Teams (HSTs) to monitor trainees (including volunteers) whilst undergoing arduous training in particular at training campuses.</p>	<p>Open</p>

Independent Monitor – Fiskville Report – July 2015

<p>12. It is recommended that CFA develop an appropriate state wide strategy for planning, construction and maintenance of practical hot fire training facilities including mobile facilities.</p>	<p>Action: Develop a state-wide strategy for planning, construction and maintenance of practical hot fire training facilities including mobile facilities</p> <p>Status: The formal Mobile Trial is now completed, and a feedback report has been finalised and distributed. Based on this feedback, a decision was made to procure mobile training props. The props are currently being manufactured at Geelong.</p> <p>In addition, the ED OT&V will create and fill a permanent, senior Facilities Manager position within the OT&V structure with responsibility for managing all training campuses across the state. This will include responsibility for developing and implementing a state-wide strategy for planning, construction and maintenance of practical hot fire training facilities including mobile facilities.⁶</p>	<p>In Progress</p>
	<p>Action: Preventative Maintenance Programme (PMP) to be developed as part of campus alignment process to enhance safety standards and reliability of infrastructure.</p> <p>Status: In June 2014 a Facilities Management System (FMS) was purchased for the Training Campuses. This system will provide central access to campus infrastructure thereby supporting the pursuit of a standardised approach across the State for planning, construction & maintenance.</p> <p>A significant 10 year funding bid has also been submitted to the Department of Treasury and Finance to support the strategy.</p>	<p>In Progress</p>

⁶ A re-structure was announced on 19 March 2015 in which OT&V will merge with the People & Culture directorate and as a result the earlier decision to create this position will need to be reviewed, in the context of this re-structure.

Independent Monitor – Fiskville Report – July 2015

	<p>EMV has since taken ownership of training campuses and whilst CFA retains responsibility for campus operations and ownership of the CFA training strategy, this issue is now being reconsidered in a broader context (from a state-wide strategic perspective encompassing all VEMTC campuses across agencies).</p> <p>The ED OT&V will create and fill a permanent, senior Facilities Manager position within the OT&V structure with responsibility for managing all training campuses across the state. This will include responsibility for developing and implementing a state-wide strategy for planning, construction and maintenance of practical hot fire training facilities including mobile facilities (in consultation with EMV).⁷</p>	
<p>13. It is recommended that an appropriate state wide data base be developed to ensure that the following information is officially recorded:-</p> <ul style="list-style-type: none"> • Type of training conducted at each session; • Type of props used; • Name of each trainee and description of each training scenario and its duration; • Record the use of all flammable liquids, dangerous goods and types of fuel used for simulation; and • Names of instructing personnel, date and time of all training sessions. 	<p><u>Status:</u></p> <p>This information is being collected in spreadsheets by the RTC Service Centre for all Regional Training Campuses.</p>	<p>Completed</p>

⁷ A re-structure was announced on 19 March 2015 in which OT&V will merge with the People & Culture directorate and as a result the earlier decision to create this position will need to be reviewed, in the context of this re-structure.

Independent Monitor – Fiskville Report – July 2015

<p>14. It is recommended that CFA establish a stringent system of procedures to ensure that any incidents that occur during hot fire training are investigated, documented and distributed to all regional training grounds for reference/implementation.</p>	<p>Action: CFA Safe reports to be completed for accidents and near misses. Completion of these reports is to be actively encouraged.</p> <p>Status: Reporting of accidents and near misses is actively encouraged. At every hot fire training scenario, a PAD operator is paid an allowance to act as a safety officer, and has the responsibility for reporting any near misses or incidents that occur into the CFA Safe system.</p> <p>This is monitored by the Training Campus HSE Committee. At Training Campus HSE Meeting on 25th September it was agreed that incidents to be tabled as part of standing agenda item for review and implementation of recommendations across all Campuses.</p>	<p>Completed</p>
<p>15. It is recommended that CFA review the use of flammable liquid fuels used in practical hot fire training and determine whether it is appropriate to utilise LPG or an equivalent instead.</p>	<p>Action: Undertake study into alternative fuels, in particular biodiesel to replace mineral diesel with a significant reduction in environmental impacts.</p> <p>Status: Biodiesel testing has been completed (see attached report from Environmental Advisor). The outcome resulted in a recommendation to move forward with Jet A1 and Kerosene as substitutes for Diesel and reduce the reliance on Unleaded Petrol.</p> <p>A review of campus infrastructure needs will now be undertaken to evaluate impact of this change. The preferred long term strategy will focus on moving to LPG as the preferred fuel for Hot Fire Training</p>	<p>Completed</p>

Independent Monitor – Fiskville Report – July 2015

<p>16. It is recommended that CFA lay concrete in PAD areas exposed to flammable liquid fuels.</p>	<p>Action: Programme to be developed to rectify this exposure and funded by installing concrete PAD's in areas exposed to flammable liquids as required.</p> <p>Status: Cardno Lane Piper has completed Environmental Site Assessments for each Training Campus. These assessments identify remediation works that may be required at Campuses prior to any concrete being laid.</p> <p>Based upon existing knowledge of campus operations we have plans to concrete at Longerenong, Penshurst and Huntly. Concrete has been poured at Longerenong for extinguisher and drum rack hot fire training props to address an urgent requirement.</p> <p>Concrete in PAD areas at campuses will be laid following remedial works and funding approval. A funding bid for the laying of concrete at regional training campuses has been submitted to the Department of Treasury and Finance for years FY2015-16.</p>	<p>In Progress</p>
<p>17. It is recommended that CFA accept and develop an implementation program for all recommendations made in the HAZCON <i>Health & Safety Reviews</i> (Report Nos. 12-0260).</p>	<p>Action: CFA to accept and develop an implementation program for all recommendations made in the HAZCON Health & Safety Reviews</p> <p>Status:</p> <p>The ED OT&V accepted all recommendations from Hazcon and engaged an independent contractor back in early 2012 to implement them. The visitation programme to Campuses has been completed and a status report has been prepared confirming that all physical works improvements have been finalised. There are systems improvements that are in varying states of completion and which are being addressed by Project 12 (HSEMS) of the Informing the Future Program.</p> <p>In April 2015 WorkSafe commenced visits to each campus to follow up on the recommendations made by HAZCON.</p>	<p>Physical works improvements Completed</p> <p>Systems improvements transferred to ITFP project 12</p>

Independent Monitor – Fiskville Report – July 2015

<p>18. It is recommended that CFA accept and develop an implementation program for all recommendations made in the Golder Associates <i>Preliminary Site Assessment – CFA Regional Training Grounds- Independent Fiskville Investigation</i> (Report No. 117613201).</p>	<p>Action: Accept and develop an implementation program for all recommendations made in the Golder Associates <i>Preliminary Site Assessment – CFA Regional Training Grounds- Independent Fiskville Investigation</i></p> <p>Status: In July 2012, CFA engaged Cardno Lane Piper to assist with the implementation of the Golder’s recommendations. As part of this work, Cardno undertook targeted environmental site assessments of each of CFA’s Training Grounds.</p> <p>Cardno’s work addresses all the recommendations made by Golder Associates. It effectively closes out this Lawrence recommendation and recommends further actions to be undertaken. A single risk-based Action Plan for all Regional Training Grounds which addresses all of Cardno’s recommendations has been prepared the implementation of which will be undertaken as new projects within the Informing the Future Program.</p>	<p>Completed</p>
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Appendix “D “

Summary of recommendations from Cardno Lane Piper investigations and the 53V audit in respect of Fiskville.

Table 1. Summary of recommendations from Cardno Lane Piper investigations

IFI Recommendation ID	Cardno Lane Piper Report Name	Cardno Lane Piper Recommendation	Recommendation being addressed by (CUP Stage of the Clean Up Plan (CUP) or the ITFP Project number)
1	Site History Review	<p>1. Investigation of the potentially contaminated areas identified in Table 3-4 of this report, if they have not already been assessed in other reports such as the Surface Water & Sediment Contamination Assessment, Groundwater Contamination Assessment, Targeted Soil Assessment, Investigation of Risks at Former Landfills or Buried Drums Assessment and subject to the requirements of the Environmental Protection Authority Auditor.</p>	<p>This recommendation will be considered as we execute CUP Stage 2: Site Assessments. The final scope of the Site Assessments will be agreed with the EPA-appointed Auditor.</p>
		<p>2. The scope of this further investigation and assessment should be confirmed with the Environmental Protection Authority Environmental Auditor and recorded in a Sampling and Analysis Quality Plan (SAQP) prior to commencement and should be undertaken at the same time as other assessment works to assist with the completion of the section 53X audit.</p>	<p>CUP Stage 2: Site Assessments.</p>
		<p>3. The volumetric balance of the soil windrows in the soil compositing area should be assessed by a surveyor to confirm if it is all accounted for on-site (e.g. by comparing initial volume in windrows and current mounds in the driver education training practice area for drills also known as the four wheel drive area).</p>	<p>CUP Stage 2: Site Assessments .</p>
		<p>4. It is recommended in relation to the Victoria University of Technology facility that they should discontinue any effluent discharge to Country Fire Authority property (including Dam 1) and be required to plan for management of their liquid effluent independently of Country Fire Authority in the future.</p>	<p>CUP Stage 5: Plans & Procedures</p>

Independent Monitor – Fiskville Report – July 2015

		5. An Environmental Management Plan should be prepared and implemented by Victoria University of Technology to control and minimise all impacts on the environment including land and water on and off-site from their facility and for management of solid and liquid wastes.	CUP Stage 5: Plans & Procedures
1	Targeted Soil Assessment	1. The soil at the flammable liquid practice area for drills and former foam training pits should be further investigated to delineate the perfluorooctane sulfonate and potentially 6:2 fluorotelomer sulfonate contamination on the periphery of the area remediated in 1998. This includes lateral and vertical delineation at the base of the previously remediated area.	This recommendation will be considered as we execute CUP Stage 2: Site Assessments.
		2. While risks to the health of the few persons potentially exposed to soil contaminated with perfluorooctane sulfonate in the flammable liquid practice area for drills and former foam training pits area is assessed to be low, exposures should be minimised through the use of appropriate Occupational Health and Safety procedures where direct contact with soil is likely, such as when cutting grass around Dam 1 or excavating soil near the adjacent oil-water separator.	Project 12 (HSEMS)
		3. The potential risk to ecosystems outside the flammable liquid practice area for drills, former foam training pits and soil composting areas due to perfluorooctane sulfonate contaminated soils, as a result of migration of contaminants to stormwater drains, requires further assessment and management by improving the drainage system in the vicinity of Dams 1 and 2.	This recommendation will be considered as we execute CUP Stage 2: Site Assessments. (Note. Once the assessments are complete any remedial actions will be addressed by CUP Stage 4: Remediation)
		4. The impacted soil at underground storage tank 1 and fuel mixing area should be further investigated to delineate the total petroleum hydrocarbons contamination. The contamination in these areas does not present a health risk, however it is odorous when exposed to air and should be managed by applying Occupational Health and Safety and environmental procedures (to be contained in the proposed Site Contamination Management Plan) if excavation occurs in these limited areas.	This recommendation will be considered as we execute CUP Stage 2: Site Assessments; and Project 12 (HSEMS)
		5. The soil beneath aboveground storage tank 2 should be assessed as aboveground storage tank has now been removed.	This recommendation will be considered as we execute CUP Stage 2: Site Assessments.
		6. All features listed in "Areas Not Yet Investigated" (refer to Section 4.1.2 of the Cardno Lane Piper's <i>Site History Review</i> report) which are not included in this investigation, are also recommended for further assessment.	This recommendation will be considered as we execute CUP Stage 2: Site Assessments.
1	Surface Soil Assessment of 4WD drive mound	1. Exposure of trainees to soil (dirt and mud) and any potential contaminants contained within should always be minimised by the use of standard Occupational Health and Safety practices including the use of personal protective equipment.	This has been communicated to campus management and will be included in the HSEMS (being developed by Project 12 (HSEMS))

Independent Monitor – Fiskville Report – July 2015

		2. The entire area of the driver education training practice area for drills (Feature 21a) or four wheel drive training facility at Fiskville should be assessed for contamination in accordance with the recommendations of the Cardno Lane Piper report on <i>Site History</i> .	This recommendation will be considered as we execute CUP Stage 2: Site Assessments.
1 & 2	Groundwater assessments Fiskville	1. Further work is recommended to investigate the extent of perfluoro compounds contamination in the shallow, perched water in the fill near Dams 1 and 2 and the flammable liquids practice area for drills, and its potential to seep to the stormwater drainage system.	CUP Stage 2: Site Assessments.
		2. An assessment of the feasibility of remediating perfluoro compounds contamination in the perched water should be completed after the further investigation of the area, including hydraulic testing of the fill.	CUP Stage 4: Remediation
		3. It is possible that some of the new bores installed during 2012 may 'gain' groundwater over time. During the next monitoring round, it is recommended that all bores should be gauged for water level and, if sufficient water is present, the bores should be developed and sampled to establish a scope for the investigation of regional groundwater.	CUP Stage 2: Site Assessments .
		4. While further investigation of the regional aquifers is not required at this time, the Environment Protection Authority Environmental Auditor, engaged recently to audit the site in compliance with an Environment Protection Authority Clean Up Notice, should be consulted to ascertain his requirements for any further investigations.	This recommendation will be considered as we execute CUP Stage 2: Site Assessments.
		5. In the event that a Reverse Osmosis water treatment plant is installed at the site, the feasibility of using the plant to treat the deep saline groundwater as a water supply for fire fighter training should be considered.	CUP Stage 4: Remediation (RO will be evaluated as part of the procurement process, if RO is selected)
7(1 & 2)	Buried Drums Assessment	1. In the event that further information becomes available regarding possible drum burial or any discoveries of buried drums are made, the proposed Site Contamination Management Plan and its protocols should be implemented to investigate and manage the issue.	CUP Stage 5: Plans & Procedures
		2. Should additional drums be uncovered in the future outside of areas already assessed, further investigation of groundwater is required including the perched water areas if identified.	CUP Stage 5: Plans and Procedures.
		3. Perched water identified in drum burial area 1 and drum burial area 2 should also be further investigated as per the recommendation discussed in the <i>Groundwater Contamination Assessment Report, Fiskville Training College</i> to further investigate the presence and quality of the perched water areas at the site.	This recommendation will be considered as we execute CUP Stage 2: Site Assessments.
3	Surface Water and Sediment Contamination Assessment	1. All reasonable measures should be undertaken to reduce or stop further discharge of contaminated water from the water management system at the site, including Lake Fiskville, from discharging to surface waters downstream.	CUP Stage 1: Containment and CUP Stage 4: Remediation.

Independent Monitor – Fiskville Report – July 2015

		<p>2. Surface soil sampling and testing should be conducted along the 'former' drainage lines which connected Dam 1 to Lake Fiskville noted in Section 3.1.</p>	<p>This recommendation will be considered as we execute CUP Stage 2: Site Assessments.</p>
		<p>3. Further sediment sampling and testing be undertaken to confirm the extent of perfluoro compounds contamination in the Creek, as well as sediment sampling and testing of farm dams located on the Creek downstream of the Site, to at least sample location CKE on Beremboke Creek.</p>	<p>This was addressed by Cardno with the downstream assessment that was completed subsequent to this report - Project 3.</p>
		<p>4. The data in this report on water and sediment quality be taken into account in the assessment of ecological or human health risk undertaken for the site or downstream.</p>	<p>This was addressed by Cardno as they completed the three HHRAs and the Ecological assessment - Project 3a.</p>
		<p>5. Assess the potential for nutrients from the sewerage treatment plant (the existing or upgraded unit) to impact on the water quality of Lake Fiskville.</p>	<p>This recommendation will be considered as we execute CUP Stage 2: Site Assessments.</p>
		<p>6. Assess the perfluoro compounds contribution from leaching of residual aqueous film forming foam adsorbed onto infrastructure in the practice area for drills;</p>	<p>This recommendation will be considered as we execute CUP Stage 2: Site Assessments.</p>
		<p>7. Further surface water and/or sediment assessments should include a selective screening for extended perfluoro compounds also present at the Site.</p>	<p>CUP Stage 2: Site Assessments and CUP Stage 6: Monitoring.</p>
		<p>8. Remediation works should be carried out based on the assessments of risk and the feasibility of remediation, work which is currently underway. Following the conclusion of the feasibility assessment, the most suitable option for remediation and management of surface water and sediments in the on-site water bodies should be implemented.</p>	<p>CUP Stage 4: Remediation</p>
		3	Supplementary Surface Water and Sediment Sampling Downstream
<p>2. Consideration should be given to include extended PFC analysis for future surface water and sediment assessment at the Site.</p>	<p>CUP Stage 2: Site Assessments and CUP Stage 6: Monitoring</p>		
<p>3. Delineate the level of perfluoro compounds concentrations in water and sediment extending downstream between sample location CKE and the confluence of the Beremboke and Eclipse Creeks.</p>	<p>This recommendation will be considered as we execute CUP Stage 2: Site Assessments.</p>		

Independent Monitor – Fiskville Report – July 2015

3	Aquatic Ecology Assessment	Take all reasonable measures to:	
		1. Reduce or stop further discharge of contaminated water from the water management system at the site, including Lake Fiskville, from discharging to surface waters downstream. As noted (in Section 6.3) it is understood that plans are being developed to divert creek flow around the lake and undertake remedial works within it.	CUP Stage 1: Containment and CUP Stage 4: Remediation.
		2. Ensure that there is no stocking of fish into Lake Fiskville.	This has been communicated to campus staff and management and will be formally documented by CUP Stage 5: Plans and Procedures
		Additional work:	
		1. Undertake further investigations in relation to Moorabool River in the reach downstream of its confluence with Eclipse Creek (and if necessary at appropriate reference locations). Investigations that should be considered include chemical analysis of aquatic biota, quantitative surveys of aquatic macroinvertebrates and ecotoxicological experiments.	This recommendation will be considered as we execute CUP Stage 2: Site Assessments.
		2. Undertake further investigations of Beremboke and Eclipse creeks, including the confluence of Eclipse Creek at Moorabool River (this would require access to private property). This investigation would help to facilitate ecological risk assessment and may provide more data on PFOS in aquatic biota to help define a gradient between the Fiskville Training College and Moorabool River. Key objectives would be to: <ul style="list-style-type: none"> • Confirm presence or absence of any fish in farm dams (or any large, natural pools) occurring downstream of Lake Fiskville • Collect aquatic biota for analysis of contaminants, particularly PFCs • Describe in-channel and riparian habitats • Undertake rapid assessment of in-stream habitats (as described in ANZECC 2000) • Investigate selection of sites for possible longer term quantitative monitoring. 	This recommendation will be considered as we execute CUP Stage 2: Site Assessments.
3 & 5	Human Health Risk Assessment - CFA Training Personnel	1. Maintenance activities on Dam 1 and 2 should be designed to involve minimal contact with water and wet sediments. Where maintenance of the dams is required with high potential exposure to sediments, such as clearing vegetation, specific Occupational Health and Safety measures should be implemented that minimise contact with sediments, consistent with existing Site procedural requirements.	Project 12 (HSEMS) Note. This was initially addressd by ITFP Project 6 and the deliverable now forms part of the HSEMS.
		2. OHS protocols should be implemented for workers and visitors accessing the dams for maintenance or monitoring purposes. The minimum procedure would involve the use of waterproof gloves, safety glasses, rubber boots and waders in place of or in addition to normal personal protective equipment used by workers accessing the practice area for drills. This is consistent with Site procedural requirements.	Project 12 (HSEMS)Note. This was initially addressd by ITFP Project 6 and the deliverable now forms part of the HSEMS.

Independent Monitor – Fiskville Report – July 2015

		<p>3. All water used for fire-fighting training must be disinfected prior to use to prevent risk of exposure to microbial pathogens that are likely to be present. This includes the current temporary storage tank system as well as any new system involving other water treatment with or without recirculation of treated water for use in training drills.</p>	CUP Stage 4: Remediation
		<p>4. Routine monitoring of algae should be added to the Water Management Plan for the Site.</p>	CUP Stage 6: Monitoring
N/A	Fire Fighting Water Quality Criteria	Nil	
3	HHRA - Downstream Users	There are no recommended actions given the conclusions of this HHRA.	
3	Human Health Risk Assessment - ONSITE FISKVILLE COMMUNITY	<p>There are no recommended actions given the conclusions of this HHRA and CFA have already implemented relevant management initiatives as listed in Section 1.3. The management initiatives are as follows: • Banning of recreational activities (e.g. fishing, swimming) in water bodies at the site. Lake Fiskville and the dams have been signposted accordingly; • Management authorisation required prior to hunting activities being conducted on The Site; • Investigation into the feasible options for remediation of water bodies at The Site including Lake Fiskville; • Development of a water management strategy to provide clean water and treat contaminated water generated during training; • Altering the training program at the site to minimise the potential contaminant load in to Lake Fiskville; and • Construction of a bypass channel to divert Beremboke Creek around Lake Fiskville. This will prevent its flow through Lake Fiskville so as to minimise discharges from the lake.</p>	<p>The final dot point is addressed by CUP Stage 1 of civil works. All others were completed prior to the completion of the HHRA.</p>
8 & 9	Landfill assessment	<p>1. The Environmental Protection Authority Environmental Auditor be consulted with regard to the potential requirement for further characterisation of the perched water found within some areas of LF2.</p>	<p>This recommendation will be considered as we execute CUP Stage 2: Site Assessments.</p>
		<p>2. The Environmental Protection Authority Environmental Auditor be consulted with regard to the need for any further soil testing at the base of the landfill to demonstrate lack of migration of contamination from the landfill.</p>	<p>This recommendation will be considered as we execute CUP Stage 2: Site Assessments.</p>
		<p>3. The adequacy of the Landfill Environmental Management Plan be discussed and agreed with the Environmental Protection Authority Environmental Auditor.</p>	<p>CUP Stage 4: Remediation</p>
		<p>4. Subject to Auditor review, the Country Fire Authority adopts the Landfill Environmental Management Plan, presented in Appendix J of this report, as a guide to the rehabilitation and management of the former landfill area in the south western area of the Country Fire Authority Fiskville Training College.</p>	<p>CUP Stage 5: Plans & Procedures</p>

Independent Monitor – Fiskville Report – July 2015

N/A	Additional	<p>During remedial works following the Cardno Lane Piper assessments, perched water was also identified in the vicinity of the southern end of Lake Fiskville. This area required further assessment and possibly remediation to identify the extent and contamination status of perched water in this area.</p> <p>Based these findings and on the conclusions and recommendations of s53V Audit, prepare a SAQP sufficient to satisfy the requirement of a s.53X audit of the site.</p>	<p>CUP Stage 2: Site Assessments and CUP Stage 4: Remediation</p> <p>Note. There is no corresponding Auditor rec in the 53V audit report, however the Auditor has recommended that this be undertaken as part of the CUP.</p>
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Table 2. Summary of recommendations from 53V audit

53V Audit Report	Audit Recommendation	Recommendation being addressed by (CUP Stage of the Clean Up Plan (CUP) or the ITFP Project number)
High Priority	1. Undertake measures to cease water from the water management system at the Site (including Lake Fiskville) from discharging to downstream surface waters.	CUP Stage 1: Containment
	2. Undertake measures to ensure that the quality of water discharging to waters protected in accordance with SEPP (WoV) meets the appropriate surface water quality criteria.	CUP Stage 4: Remediation CUP Stage 6: Monitoring
	3. Implement measures to remediate water and sediments in Dams 1 to 4 and Lake Fiskville (including perched water in scoria fill near Dams 1 and 2) so that they are no longer sources of potentially unacceptable ecological risk for ecological effects and contaminated water to downstream waterways.	CUP Stage 4: Remediation
Fire Water Management	4. Implement measures to remove perched water in the scoria fill sourced from the dams and prevent outflow of Dams 1 and 2 into the scoria fill in future.	CUP Stage 4: Remediation
	5. Monitor the water quality within Dam 1 to Dam 4, Lake Fiskville and downstream waterways as part of an on-going surface water monitoring program to be implemented at the Site in accordance with the WQMP.	CUP Stage 6: Monitoring
	6. Implement measures to monitor the volume of water and available storage capacity, as well as timing / duration and volume of discharge to Lake Fiskville and Lake Fiskville to Beremboke Creek.	CUP Stage 6: Monitoring

Independent Monitor – Fiskville Report – July 2015

	<p>7. Although the quantitative health risk assessment concluded that risks to people on-Site posed by exposure to the reported concentrations of PFCs is low and acceptable, as a precautionary measure it is recommended that existing measures to prevent or minimise exposure to firewater in Dams 1 to 4 and Lake Fiskville be maintained until the water and sediments have been remediated. This includes identifying these water bodies as hazards to all people entering the Site, maintaining signs (no drinking, no swimming, no fishing) and barriers, restricting public access to the Site, as well as regularly reinforcing the hazards to CFA staff.</p>	<p>Measures have been implemented; CFA will maintain them as recommended</p>
	<p>8. As a precautionary approach, it is recommended that water should not be extracted from Lake Fiskville for any use and fish should not be stocked in Lake Fiskville.</p>	<p>Measures have already been implemented. CFA will implement procedures to reinforce them in CUP Stage 5: Plans & Procedures</p>
	<p>9. Although human consumption (i.e. drinking) of water from Beremboke and Eclipse Creeks downstream of the Site is considered to be unlikely, the reported concentrations of PFOS in surface water in Beremboke Creek and Eclipse Creek are such that the Auditor recommends that, as a precautionary measure, potential users of water from Beremboke Creek and Eclipse Creek (downstream of the Site) are advised that the water should not be used for human consumption (i.e. drinking water).</p>	<p>CUP Stage 3: Off-site works</p>
Controls on Foams Used	<p>10. Once a foam product has been selected for use at the Site based on the nominated criteria in the Foams review, consideration should be given to undertaking independent chemical validation of the absence of PFC in foam products prior to use on-Site to confirm that the foam does not contain PFOS, PFOA or compounds that break down to PFOS or PFOA in the environment.</p>	<p>CUP Stage 5: Plans & Procedures</p>
	<p>11. Consideration should also be given to undertaking independent chemical validation of the absence of PFC in foam products currently stored at the Site to confirm that the foam does not.</p>	<p>CUP Stage 5: Plans & Procedures</p>
Groundwater	<p>12. As a minimum, it is recommended that existing groundwater wells are re-gauged. If they contain sufficient groundwater, the wells will need to be developed, then sampled in accordance with EPA Publication 669 (Groundwater Sampling Guidelines).</p>	<p>CUP Stage 2: Site Assessments</p>
	<p>13. Undertake further investigation of the potential for live fire training to contaminate regional groundwater, particularly in the vicinity of the PAD, Dams 1 and 2 and Lake Fiskville.</p>	<p>CUP Stage 2: Site Assessments</p>
	<p>14. It is recommended that the extent and quality of contaminated perched water identified in scoria fill in the vicinity of Dams 1 and 2 and its potential to discharge to the surface (including stormwater drains) be investigated</p>	<p>CUP Stage 2: Site Assessments</p>
Buried Drums	<p>15. It is recommended that information regarding the potential for discovery of buried drums at the Site (as well as other waste / sludge disposal) and proposed actions be included in a Site Contamination Management Plan (SCMP).</p>	<p>CUP Stage 5: Plans & Procedures</p> <p>Note. It may be inferred that this Rec also applies to CLP Rec 20.</p>

Independent Monitor – Fiskville Report – July 2015

Landfills	16. It is recommended that a cover be placed over the Former Landfill Areas. The cover would include placement of compacted clay, a geogrid and top soil followed by revegetation with grass.	CUP Stage 4: Remediation
	17. Following the placement of the cover, it is recommended that the Landfill Environmental Management Plan (LEMP) be implemented.	CUP Stage 5: Plans & Procedures
Storage and Management of Chemicals	18. The storage of all chemicals, drums and props containing chemicals (e.g. vehicles prior to debugging), as well as the debugging of props be undertaken on a sealed and bunded surface.	CUP Stage 5: Plans & Procedures
	19. A procedure for managing leaks / ruptures of fuel pipelines should be developed and implemented.	CUP Stage 5: Plans & Procedures
Data Gaps	20. It is recommended that a program of further soil investigation be prepared to address the identified data gaps and enable the degree and extent of soil contamination to be determined.	CUP Stage 2: Site Assessments
	21. It is recommended that an assessment of the volume of soil remaining in the SCA and the potential fate of the remainder of the remediated material be undertaken.	CUP Stage 2: Site Assessments
	22. It is recommended that the potential for residual PFCs (from historical live fire training) to leach from existing infrastructure (concrete, pipes, hoses) into storm water and fire water run-off be assessed.	CUP Stage 2: Site Assessments
	23. It is recommended that further investigation of dioxins and furans in sediments in Lake Fiskville be undertaken to confirm that the limited reported concentrations are representative of sediment within the Lake (and therefore confirm the conclusions relating to human health and ecological risk regarding dioxins and furans).	CUP Stage 2: Site Assessments
	24. It is recommended that the presence of Bis(2-ethylhexyl)phthalate in various media at the Site and potential implications for beneficial uses be further assessed.	CUP Stage 2: Site Assessments
Site History	25. The VUT facility (Feature 31) should discontinue effluent discharge to the CFA property and plan for the management of liquid effluent independently of CFA in the future.	CUP Stage 1: Containment CUP Stage 5: Plans & Procedures
	26. An Environmental Management Plan should be prepared and implemented by VUT to control and minimise all impacts on the environment including land and water on and off-Site from their facility, and for management of solid and liquid wastes.	CUP Stage 5: Plans & Procedures
Additional	27. During remedial works following the Cardno Lane Piper assessments, perched water was also identified in the vicinity of the southern end of Lake Fiskville. This area required further assessment and possibly remediation to identify the extent and contamination status of perched water in this area. Based these findings and on the conclusions and recommendations of s53V Audit, prepare a SAQP sufficient to satisfy the requirement of a s.53X audit of the site.	CUP Stage 2: Site Assessments CUP Stage 4: Remediation Note. There is no such rec in the 53V audit report, however subsequent to the Audit the Auditor has recommended that this be undertaken a part of the CUP.